

8-12-2017

# Inaugural Research Symposium

Office of the Associate Dean of Research UTRGV School of Medicine  
*The University of Texas Rio Grande Valley*

Follow this and additional works at: [https://scholarworks.utrgv.edu/som\\_pub](https://scholarworks.utrgv.edu/som_pub)

 Part of the [Medicine and Health Sciences Commons](#)

---

## Recommended Citation

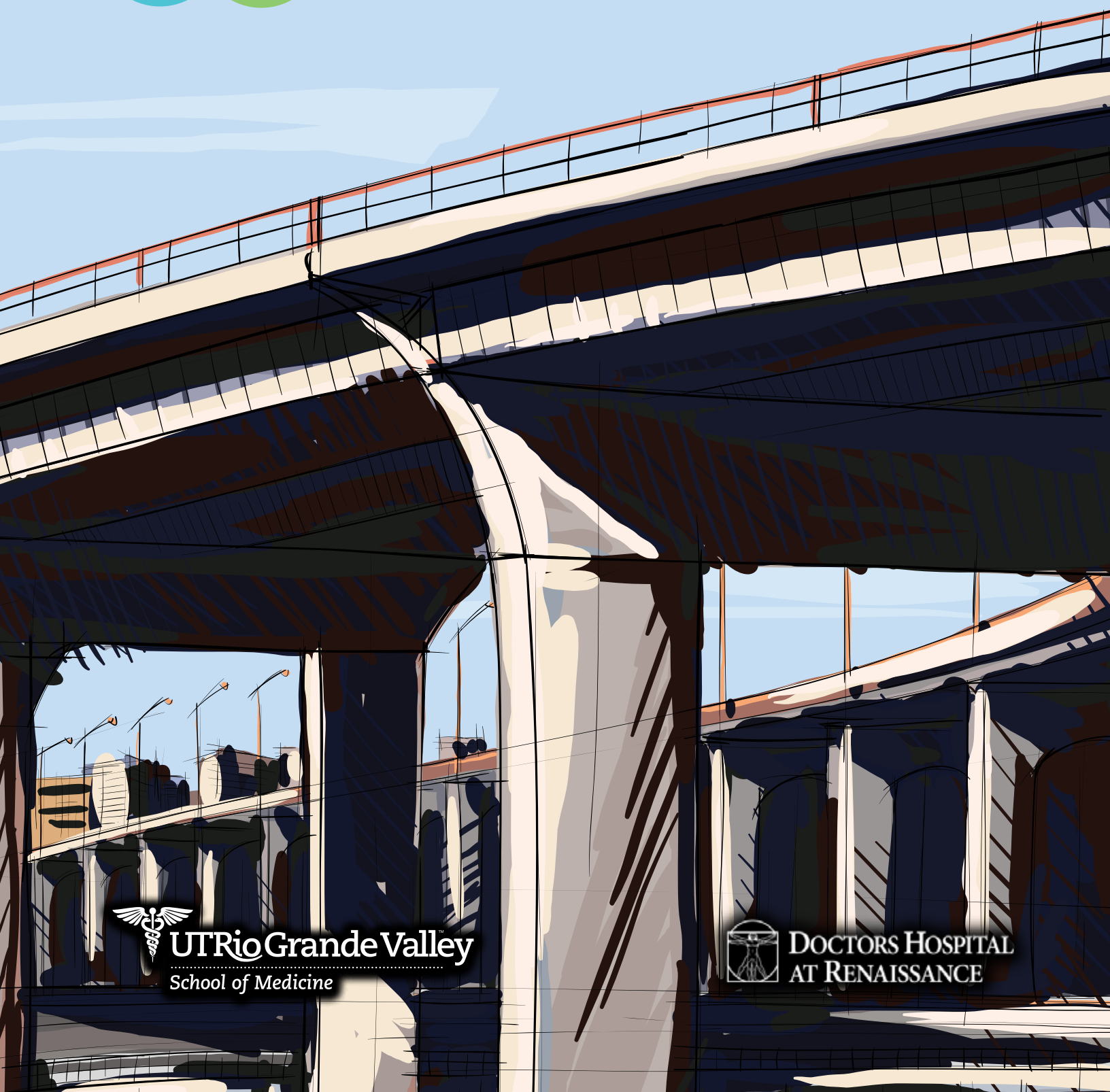
UTRGV School of Medicine, Office of the Associate Dean of Research, "Inaugural Research Symposium" (2017). *School of Medicine Publications and Presentations*. 3.  
[https://scholarworks.utrgv.edu/som\\_pub/3](https://scholarworks.utrgv.edu/som_pub/3)

This Conference Proceeding is brought to you for free and open access by the School of Medicine at ScholarWorks @ UTRGV. It has been accepted for inclusion in School of Medicine Publications and Presentations by an authorized administrator of ScholarWorks @ UTRGV. For more information, please contact [justin.white@utrgv.edu](mailto:justin.white@utrgv.edu), [william.flores01@utrgv.edu](mailto:william.flores01@utrgv.edu).



*Inaugural*

# Research Symposium



**UT Rio Grande Valley**  
School of Medicine



**DOCTORS HOSPITAL  
AT RENAISSANCE**

THE UNIVERSITY OF TEXAS RIO GRANDE VALLEY SCHOOL OF MEDICINE



*Inaugural*

# Research Symposium

**August 12, 2017**

## Planning Committees

Steering Committee Chair: Dr. Andrew Tsin, Associate Dean of Research  
Scientific Committee Chair: Dr. Annelyn Torres-Reveron, Assistant Professor Biomedical Sciences  
Event Planning Committee Chair, Veronica Vera, Sr. Grants and Contracts Program Coordinator

### Steering Committee

#### *Committee Members:*

Dr. Sarah Williams-Blangero, Director of the South Texas Diabetes and Obesity Institute, UTRGV-SOM  
Dr. Julie Anderson, Associate Dean for Accreditation, College of Health Affairs, UTRGV-SOM  
Dr. Beatriz Tapia, Assistant Dean for Faculty Development and Faculty Affairs, UTRGV-SOM  
Dr. Lisa Treviño, Vice President for Research and Development, DHR  
Dr. Gregory Rapoport, Internal Medicine Resident, DHR Graduate Medical Education, UTRGV-SOM  
Dr. Annelyn Torres-Reveron, Assistant Professor Biomedical Sciences, UTRGV-SOM  
Veronica Vera, Senior Grants and Contracts Coordinator, UTRGV-SOM  
Frances Garcia, Administrative Assistant for Associate Dean of Research, UTRGV-SOM  
David Goldblatt, UTRGV Medical Student, Inaugural Class of 2020  
Leah Bryan, UTRGV Medical Student, Inaugural Class of 2020

### Scientific Program Committee

#### *Committee Members:*

Dr. Sara Reyna, Assistant Professor, Biomedical Sciences, UTRGV-SOM  
Dr. Julie Anderson, Associate Dean for Accreditation, College of Health Affairs, UTRGV-SOM  
Dr. Jessica Martin, Adjunct Assistant Professor, DHR Internal Medicine Program, UTRGV-SOM  
Dr. Joanne E. Curran, Ph.D., Professor, South Texas Diabetes and Obesity Institute, UTRGV-SOM  
Dr. Juan Lopez-Alvarenga, Assistant Professor of Research, South Texas Diabetes and Obesity Institute, UTRGV-SOM  
Leslie Rivera-Lopez, Research Associate II, UTRGV-SOM  
Victoria Ragland, Medical Student, Inaugural Class of 2020  
David Goldblatt, Medical Student, Inaugural Class of 2020  
Leah Bryan, Medical Student, Inaugural Class of 2020  
Zachary Donovie, Medical Student, Inaugural Class of 2020

### Event Planning Committee

#### *Committee Members:*

Dr. Annelynn Torres-Reveron, Assistant Professor Biomedical Sciences, UTRGV-SOM  
Dr. Shivani Maffi, Associate Professor Research, Biomedical Sciences, UTRGV-SOM  
Dr. Deyanira Galvan, Graduate Medical Education Resident, UTRGV-SOM  
Robert Gomez, Financial Manager, South Texas Diabetes and Obesity Institute, UTRGV-SOM  
Dalyn Ruiz, Campus Affairs Coordinator, University Marketing & Communications, UTRGV  
Frances Garcia, Administrative Assistant for Associate Dean of Research Dept., UTRGV-SOM  
Leslie Rivera, Research Associate II, UTRGV-SOM  
Victoria Ragland, Medical Student, Inaugural Class of 2020  
David Goldblatt, Medical Student, Inaugural Class of 2020  
Leah Bryan, Medical Student, Inaugural Class of 2020  
Amanda Arreola, Medical Student, Inaugural Class of 2020



# Table of Contents

Welcome (Dr. Krouse) .....	5
Sponsorships .....	6
Program Schedule .....	7
Map .....	8
List of participating Institutions .....	9
Keynote Speaker .....	11
Plenary Session Speakers .....	12
Oral Presentation Schedule .....	16
Oral Presentations .....	19
Undergraduate Category Posters Session I .....	32
Graduate Category Posters Session I .....	51
Medical Student Posters Session II .....	62
Medical Resident Posters Session II .....	69
Post Doctoral Posters Session II .....	74
High School Student posters Session II .....	78
All Other Posters Category Poster Presentations .....	80
Late Breaking Submission Presentations .....	94



Dr. John H. Krouse joined the UTRGV School of Medicine in July, 2017 as the new Vice President for Medical Affairs and Dean of the School of Medicine. Dr. Krouse comes from Temple University in Philadelphia, Pennsylvania, where he served as the Senior Associate Dean for Clinical Affairs; President of Temple University Physicians; Professor and Chairman of the Department of Otolaryngology-Head and Neck Surgery; and Director of the Head and Neck Institute at the Lewis Katz School of Medicine. He also served as Associate Dean for Graduate Medical Education from 2012-2015. Dr. Krouse graduated from Carnegie-Mellon University in Pittsburgh, Pennsylvania, and received his Ph.D. in clinical psychology from the University of Rochester, New York. He earned his Doctor of Medicine degree from Harvard Medical School in Boston, Massachusetts. He received a Master of Business Administration from the Fox School of Business at Temple University in 2014. He completed his internship in surgery at Beth Israel Hospital and his residency training in otolaryngology-head and neck surgery at the Massachusetts Eye and Ear Infirmary/Harvard Medical School in Boston. He is board certified in otolaryngology.

# Welcome to the

*Inaugural*

# Research Symposium



On behalf of our faculty, staff, and students, I am pleased to welcome you to the UTRGV School of Medicine's Inaugural Research Symposium. In collaboration with Doctors Hospital Renaissance Health System, we are excited to bring this program to the Valley and to showcase the outstanding research done by investigators both at the University and in the community. The oral and poster presentations that you will experience today are examples of the excellent work that these researchers have completed. They provide an expansion of knowledge in these key disciplines and demonstrate the diligence and commitment of these individuals in their pursuit of science. We hope that this inaugural symposium will not only showcase the work done by researchers here in the Valley, but will also serve to stimulate further interest and engagement in the expansion of these research activities.

One of the key missions of a medical school is the sponsorship and conduct of research activities, including basic, translational, and clinical research. It is through research that we engage our students in critical thinking and in enhancing scientific curiosity. Research serves as the basis for evidence into the quality and efficacy of clinical care and in enhancing patient safety. Discoveries made in the laboratories of our basic scientists assist in the understanding of mechanisms in both health and disease, and offer the foundation for translating these findings into clinical interventions. Research provides public visibility for a medical school and contributes to its reputation as an institution of higher learning.

It is with these key principles in mind that I once again welcome you to this Research Symposium. Thank you for attending and for participating with us in this important scholarly activity. Please enjoy the day and the program!

**John H. Krouse, MD, PhD, MBA**  
*Dean, School of Medicine*  
 Vice President, Medical Affairs

# Sponsorships

## Platinum

### See More Than Before

Introducing the Eclipse Ti2, Nikon's all-new inverted microscope platform for advanced imaging.

Nikon Instruments has raised the bar for core imaging capability with the release of the new Eclipse Ti2 Inverted Research Microscope. With its unprecedented 25mm field of view, you can capture twice as much data with a single image. The fourth generation Perfect Focus System combined with a completely redesigned Z-drive provide a super-stable imaging platform with high-precision focusing for demanding applications. Built-in sensors and intelligent Assist Guide eliminate user error while the internal detector enables you to see the back-aperture for alignments.

There's so much more! For more information, contact your local Nikon sales representative, call 1-800-52-NIKON (1-800-526-4566) or visit [www.nikon-ti2.com](http://www.nikon-ti2.com).



Nikon Instruments Inc. • [www.nikoninstruments.com](http://www.nikoninstruments.com) • [nikoninstruments@nikon.net](mailto:nikoninstruments@nikon.net)

Nikon Instruments, Inc. is a world leader in the development and manufacture of optical and digital imaging technology for biomedical research and clinical laboratory science. Now in its 100th year, Nikon provides complete microscope systems that offer optimal versatility, performance and productivity. Cutting-edge instruments include microscopes, motorized peripherals, digital imaging products and highly acclaimed Nikon Image System Elements (NIS-Elements) Imaging Software. Nikon Instruments is most recognizable for its state-of-the-art, fully-integrated microscope systems and that offer users complete solutions. From confocal and multiphoton microscopes, to peripherals, to software - all in integrated solutions, Nikon Instruments, Inc. products are used in some of the most cutting-edge research and clinical sciences today. Come see David Mohr – Biosystems Specialist and Eldon Granier – Advanced Imaging Specialist, at our table in the UTRGV Research Symposium.

## Gold



**Charlene Laughlin**  
Technical Sales Representative

800-227-9997 ext.330  
Cell#314-471-9245  
[charlene.laughlin@midsci.com](mailto:charlene.laughlin@midsci.com)  
<http://www.midsci.com>



**Kyle M. Franks**  
Biosciences Account Manager –  
Texas Life Sciences Solutions

ThermoFisher Scientific  
5823 Newton Drive  
Carlsbad, CA 92008  
Tel: +1 (760) 268-5330  
Cell: (760) 331-4838  
[kyle.franks@thermofisher.com](mailto:kyle.franks@thermofisher.com) [www.thermofisher.com](http://www.thermofisher.com)



**Lindsay Roberts**  
Account Manager

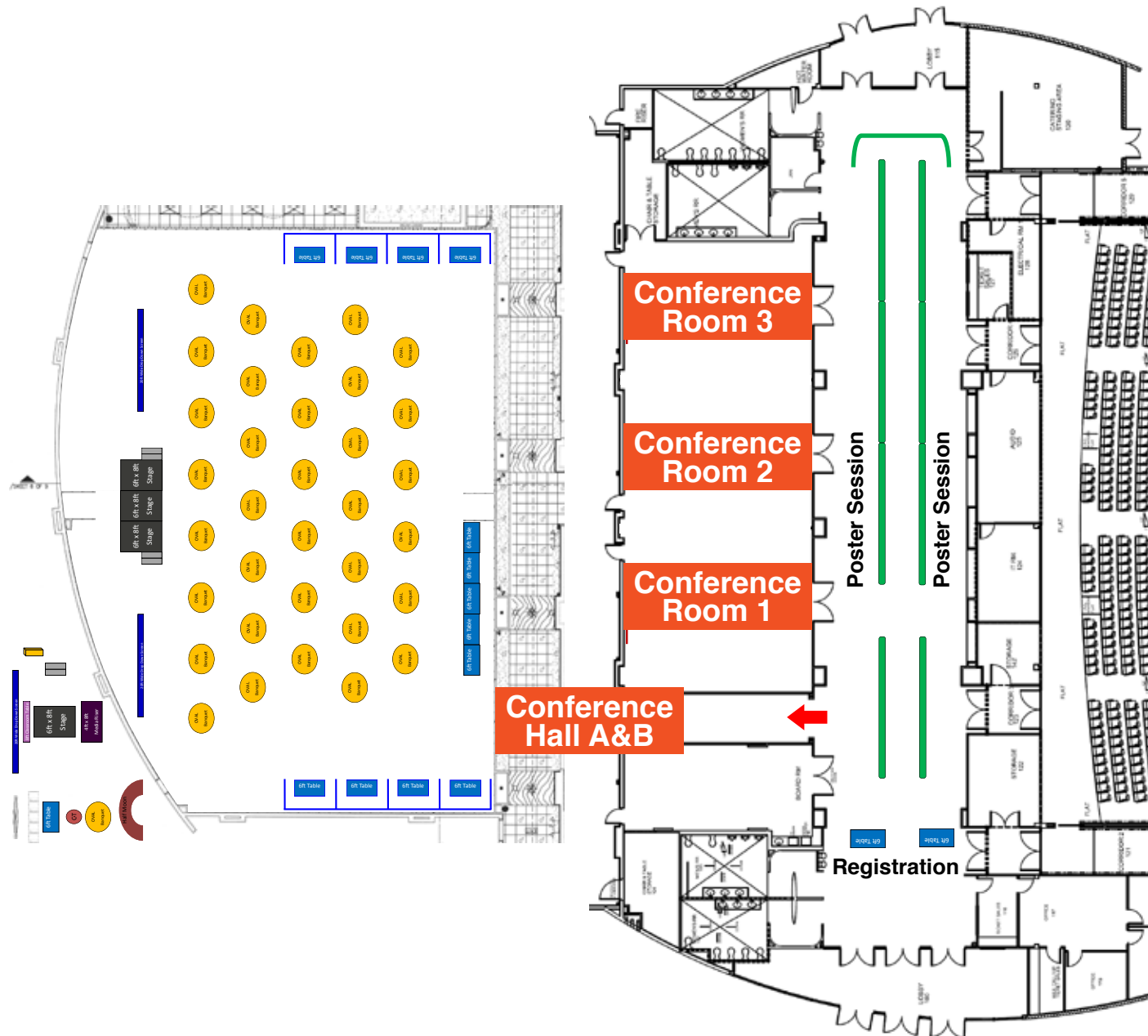
Carl Zeiss Microscopy, LLC ZEISS Group  
One Zeiss Drive Thornwood, New York  
10594 United States  
Mobile: +1 480 467-7593  
Customer Service: +1 800 233-2343  
Email: [lindsay.roberts@zeiss.com](mailto:lindsay.roberts@zeiss.com)

# Program Schedule

<b>Registration</b> .....	8:00 -8:45 a.m.
<i>Edinburg Conference Center Lobby</i>	
<b>Welcome</b> .....	8:45-9:00 a.m.
<i>by Dean of the School of Medicine, Dr. John H. Krouse   Conference Hall A&amp;B</i>	
<b>Exhibits</b> .....	9:00-3:00 p.m.
<i>Conference Hall A&amp;B</i>	
Concurrent Plenary Sessions & Oral Presentations I .....	9:00-11:30 a.m.
- Dr. Deepu George	<i>Conference Room 1</i>
- Clinical Oral Presentations -Group A	
- Dr. Blanca Restrepo	<i>Conference Room 2</i>
- Diabetes Oral Presentations	
- Dr. Beatriz Tapia	<i>Conference Room 3</i>
- Global/Public Health Oral Presentation	
- Biomedical/Basic Science Oral Presentations	<i>Conference Hall A&amp;B</i>
<b>Poster Session I Undergraduate and Graduate Posters</b> .....	9:00 -12:00 p.m.
<i>Edinburg Conference Center Lobby</i>	
<b>*Morning Break</b> .....	10:15-10:30 a.m.
<i>Conference Hall A&amp;B</i>	
<b>Lunch Break</b> .....	11:30-1:00 p.m.
<i>Conference Hall A&amp;B</i>	
<b>Poster Session II</b> .....	12:00-3:00 p.m.
<i>Medical Students, Medical Residents, Post-Doc Fellows, Faculty/Others and High School Posters   Edinburg Conference Center Lobby</i>	
<b>Concurrent Plenary Session &amp; Oral Presentations II</b> .....	1:00-3:30 p.m.
- Clinical Oral Presentations Continuation	<i>Conference Room 1</i>
- Group B	
- Dr. Gabriel de Erausquin	<i>Conference Room 2</i>
- Neuroscience Oral Presentations	
- Dr. Ravindranath Duggirala	<i>Conference Room 3</i>
- Genomics Oral Presentations	
<b>*Afternoon Break</b> .....	2:15-2:30 p.m.
<i>Conference Hall A&amp;B</i>	
<b>Keynote Speaker, Dr. Nicolas Musi*</b> .....	3:30 - 4:30 p.m.
<i>Conference Hall A&amp;B</i>	
<b>Awards Ceremony and Closing Remarks</b> .....	4:30-5:00 p.m.
<i>Conference Hall A&amp;B</i>	

*\*Coffee and tea are available all day in Conference Hall A&B.*

*CME Credit Available\**



# Thank You

United Health Foundation • Methodist Health Care Ministries of South Texas  
 National Institutes of Health • Valley Baptist Legacy Foundation  
 U.S. Department of Health and Human Services • American Medical Association  
 Hogg Foundation • City of McAllen • City of Mission  
 City of Pharr • Hidalgo County

### Special Thanks

Judge Volunteers  
 Student Volunteers  
 Staff Volunteers

### Participating Institutions

- Hidalgo County Health and Human Services, Edinburg, Texas
- The University of Texas Health Science Center San Antonio
- UT Health School of Public Health
- The University of Texas at San Antonio
- UT MD Anderson Cancer Center
- John Hopkins University, SOM
- University of Texas A&M- Corpus Christi
- National Natural Toxins Research Center-Texas A&M University-Kingsville
- Stanford University School of Medicine
- Ponce Health Sciences University, School of Medicine
- South Texas Diabetes and Obesity Institute -UTRGV-SOM
- Texas Biomedical Research Institute
- Menzies Institute for Medical Research, University of Tasmania, Hobart, Australia
- Iowa State University
- University of Texas Dallas
- Hospital Central de los Instituto Venezolano de Seguros Sociales
- Universidad Valle Mexico Reynosa Tamaulipas, Mexico
- Universidad Autonoma de Nuevo Leon, Mexico
- Instituto Politécnico Nacional, Centro de Biotecnología, Reynosa, Mexico
- Texas Tech University Health Science Center
- Genomic Bioanalysis Laboratory. Vitagénesis, SA de CV. Monterrey, Mexico
- Universidad Autonomous of Tamaulipas, Mexico
- School of Medicine, Universidad México Americana del Norte, Reynosa, Mexico
- Facultad de Medicina e Ingeniería en Sistemas Computacionales de Matamoros, Mexico
- Hospital Regional de Alta Especialidad de Ciudad Victoria, Mexico
- Centro de Biotecnología Genómica, Instituto Politécnico Nacional, Reynosa, México
- Universidad Autónoma de San Luis Potosí, San Luis Potosí, SLP, México
- Autonomous University of Guerrero, Mexico





## Keynote Speaker

*“Pros and Cons of Inhibiting Inflammation in Aging.”*

**presented by, Dr. Nicolas Musi**

*Professor of Medicine*

Director, Barshop Institute for Longevity and Aging Studies

Director for the Center of Healthy Aging, San Antonio Geriatric Research Education, and Clinical Center University of Texas Health Science Center

Dr. Nicolas Musi is presently the Director of the Barshop Institute for Longevity and Aging Studies at the University of Texas Health Science Center, San Antonio. The Barshop Institute’s mission is to understand the basic biology of aging; to discover the therapies that will treat and cure the diseases of aging by fostering dynamic, collaborative research; to education and train future scientists and clinicians; to promote public awareness of age-related issues. Dr. Musi is a physician-scientist who received his Medical Degree from the Universidad of Anahuac in Mexico City and his training in internal medicine from the University of

Miami-Jackson Memorial Medical Center. He received his clinical and research fellowship in Endocrinology and Metabolism at the Joslin Diabetes Center-Beth Israel Deaconess Medical Center and Harvard Medical School. In 2003, Dr. Musi was recruited by UTHSCA as a faculty member of the Division of Diabetes in the Department of Medicine. He has been Director of the Barshop Institute for Longevity and Aging Studies since 2013 and Director of the Geriatric, Research, Education and Clinical Center (GRECC) of the San Antonio VA, since 2010. His research expertise is in aging, insulin resistance, and exercise physiology.

***This section has been approved for 1 CME credit at no cost for doctors.***



# Plenary Speakers

Sponsored by: The UTRGV School of Medicine



**Gabriel de Erausquin, MD, PhD**

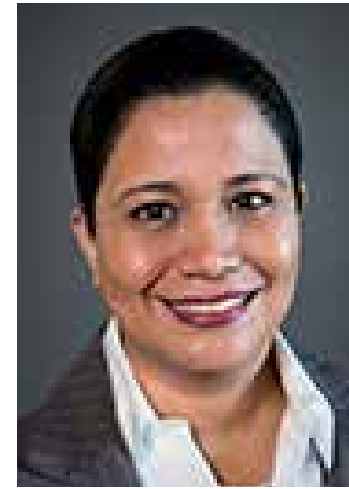
*Professor and Founding Chair*  
Department of Psychiatry and Neurology  
Head of the Division of Neurosciences  
Department of Biomedical Sciences  
Interim- Director of the Institute of Neuroscience  
School of Medicine - University of Texas Rio Grande Valley

Dr. de Erausquin is Professor and Founding Chair of the Department of Psychiatry and Neurology, and Head of the Division of Neurosciences at University of Texas Rio Grande Valley School of Medicine. He was born in Buenos Aires, Argentina. He began research training as a junior medical student in the University of Buenos Aires, in Argentina and upon graduation from Medical School he moved to the laboratory of Dr. Carlos María Baratti, where he completed a Ph.D. in behavioral pharmacology. He completed postdoctoral training at the Institute of Neurosciences at Georgetown University, in Washington, D.C., and residency training in psychiatry at Yale University, and in neurology at Washington

University School of Medicine in Saint Louis. After completing his clinical training Dr. de Erausquin received a Masters of Science in Genetic Epidemiology from the Department of Biostatistics at Washington University. He also received training in neurochemical brain imaging at Yale University, with a Veterans Administration Psychiatry Research Fellowship, and completed a fellowship in deep brain stimulation for movement disorders at Washington University School of Medicine. Dr. de Erausquin's current research focuses on the mechanism of susceptibility of embryonic dopaminergic neurons to cell death during the second trimester of intrauterine development, which may result in loss of a critical subpopulation of neurons forming the mesocortical projection; a connection system whose lesion could explain many of the symptoms of schizophrenia.

**Plenary Presentation Title: The butterfly effect and the prevention of psychosis: from cell channels to complex behavior.**

Intracellular calcium homeostasis in dopaminergic neurons is an exquisitely balanced process, that can be upset by environmental challenges during neurodevelopment leading to neuronal commitment to die. Discovery of the molecular pathway causing the susceptibility of dopaminergic neurons led us up a completely unexpected and far reaching path of research that my result in the complete prevention of one of the most devastating mental illnesses: schizophrenia.



**Beatriz Tapia, MD**

*Assistant Dean of Faculty Development*  
Director of the South Texas Environmental Education and Research (STEER) Program  
School of Medicine - University of Texas Rio Grande Valley

Beatriz Tapia, M.D., M.P.H., C.P.H. is the Director of STEER and Course Director for the Environmental Medicine/ Border Health Elective. She is an Assistant

Professor in the Department of Pediatrics and the Assistant Dean of Faculty Development at the University of Texas Rio Grande Valley in Harlingen, Texas. Dr. Tapia is a native of Chicago, Illinois. She attended the Autonomous University of Puebla in Mexico, where she received her M.D., and the Bloomberg School of Public Health at Johns Hopkins University (JHSPH), in Baltimore, Maryland, where she received her Master's in Public Health. In addition to her M.P.H., Dr. Tapia trained in occupational health and environmental medicine, health disparities and health inequality at the JHSPH. Dr. Tapia is also currently pursuing a Doctorate of Education in Professional Leadership with an Emphasis in Health Science Education from the University of Houston.

She is active in numerous border health organizations, and is currently appointed the U.S. co-facilitator of the environmental health subcommittee for the Gulf Taskforce of the United States – México Border Health Commission- Border

2020 (formally Border 2012). She also served on the expert advisory group for Border 2012, which was charged with updating a training module of the Physician's Guide to Pesticide Poisoning for border physicians.

Dr. Tapia is a strong advocate for the medically underserved; she continuously provides environmental and public health education to promotoras (lay healthcare workers), public health professionals and community centers. Her research interests are border health, environmental medicine, public health, minority health and medical education research.

**Plenary Presentation title: Arbovirus disease in South Texas - Vulnerable Populations**

Families along the US-Mexico border are at particularly high risk for contracting the arthropod-borne viruses (arboviruses) dengue, chikungunya and Zika. These viruses are carried and transmitted by the mosquito vectors *Aedes aegypti* and *Ae. albopictus*, species endemic to the US-Mexico border region.

The goal of this community based participatory research (CBPR) project is to utilize trained promotoras to educate at-risk families on inexpensive, culturally acceptable measures that discourage mosquito breeding in order to minimize transmission of these potentially life-threatening illnesses. We will present an assessment of the knowledge, attitudes, and behavior changes regarding mosquito control methods and disease prevention within communities in the Rio Grande Valley. The purpose of this CBPR project is to provide training for community healthcare workers (promotoras) on the identification and prevention of arboviruses, at a time when the local city of Brownsville, TX is experiencing an outbreak of autochthonous Zika transmission.





# Plenary Speakers

Sponsored by: *The UTRGV School of Medicine*



**Deepu George, PhD**

*Clinical Assistant Professor*  
Family and Preventive Medicine  
School of Medicine - University of Texas Rio Grande Valley

Deepu George, PhD is a behavioral science faculty at the University of Texas Rio Grande Valley, School of Medicine's Family Medicine Residency Program at

Doctors Hospital at Renaissance. In addition to training family medicine residents in behavioral health skills in primary care, he also works with them in clinic as part of an integrated behavioral health family medicine clinic. Dr. George completed a doctoral internship in Medical Family Therapy and Integrated care from Duke / Southern Regional AHEC Family Medicine Residency from North Carolina and his PhD

**Blanca Restrepo, PhD**

*Associate Professor in Epidemiology*  
UT Health Science Center of Houston  
School of Public Health, Brownsville Regional Campus



Blanca Restrepo has a Ph.D. in Microbiology and is Associate Professor of Epidemiology at the UTHHealth Houston, School of Public Health in Brownsville. She has

conducted studies on the epidemiology and immunology of TB and type 2 diabetes (T2DM) on the Texas-Mexico border. In these border communities, her team has found that nearly 40% of the TB patients have T2DM co-morbidity, and that T2DM contributes to at least 1/4th of the TB cases. Her studies on the underlying biology of the association between TB and DM2 suggested that T2DM patients have an underperforming innate immunity, but exaggerated (in ineffective) adaptive responses.

in Human Development and Family Science from the University of Georgia. He is passionate about increasing access to behavioral health in primary care by integrating behavioral health in Graduate Medical Education programs and training physicians to be skilled in behavioral and psychosocial competencies.

**Plenary Presentation Title: Primary Care Behavioral Health: Changing behavior one consult at a time**

While the term behavioral health generally evokes images of mental health diagnoses and substance abuse issues, the word has broader implications in a primary care setting. In primary care, behavioral health is an umbrella term for the care that addresses any behavioral problems impacting health, including mental health and substance abuse conditions, stress-linked physical symptoms, patient activation and health behaviors (Peek, 2013). Using cases from a clinic where behavioral health is integrated, this presentation will introduce the learner to the Primary Care Behavioral Health (PCBH) model and developments from an on-going study evaluating the PCBH model in the Rio Grande Valley. The presentation will also introduce present how the PCBH model informs residency training.

**Plenary Presentation Title: Diabetes and Tuberculosis: Converging of chronic and infectious diseases**

Tuberculosis (TB) is the number one bacterial killer worldwide. The worldwide increase in type 2 diabetes mellitus patients (T2DM), particularly in countries where TB is also endemic, has led to the re-emerging importance of T2DM as a risk factor for TB. Thus, there is a need to implement strategies for TB prevention among the millions of T2DM patients exposed to Mycobacterium tuberculosis (Mtb) worldwide. My team has conducted studies on both sides of the south Texas-Tamaulipas border for 10+ years. Our community has one of the highest prevalence rates of TB-T2DM worldwide, which provides a unique opportunity to study this co-morbid-ity. I will present key findings from our epidemiology, clinical and basic science studies on TB- T2DM, including: 1) the magnitude of our TB-T2DM problem, 2) the association between T2DM and adverse TB treatment outcomes, 3) and the mechanisms by which T2DM patients may be more susceptible to TB. I will discuss the public health implications of our findings for TB prevention among T2DM patients, and for the diagnosis of new T2DM patients at TB clinics.



**Ravindranath Duggirala, Ph.D.**

*Professor*  
South Texas Diabetes and Obesity Institute  
School of Medicine - University of Texas Rio Grande Valley

Ravindranath Duggirala's dual interests in genetic epidemiology of complex diseases such as type 2 diabetes (T2D) and obesity and anthropological genetics, Dr. Duggirala pursued

a wide breadth of scientific investigations in various human populations. Past, present and future collaborative projects include research investigations such as genetic and cultural influences on lipid levels among Mennonites in Kansas and Nebraska (United States [US]); identification of genes that influence susceptibility to complex diseases such as obesity, T2D, metabolic syndrome (MS), cardiovascular disease, diabetic nephropathy, gallbladder disease and their related quantitative traits in Mexican Americans [MAs] (US); genetics of childhood obesity and MS in MAs (US); genetic studies of T2D in India; and, genetic studies of tuberculosis to be conducted in Mexican populations, Mexico. He has been involved in national and international collaborative projects, mostly funded by NIH, which localized (are localizing) susceptibility genes for various disease conditions related to T2D and obesity. Several subsequent gene discovery projects are now in progress. In addition, he has been involved in studies that investigated the impact of gene-by-environment interaction influences on variation in complex traits. To summarize, his research efforts have been centered on genetics of complex diseases including T2D and obesity in adults and children especially involving the MA population.

**Plenary Presentation Title: Genetic Epidemiology of Type 2 Diabetes and Related Diseases in Mexican Americans: From Bench to Bedside – Are We There Yet?**

Type 2 diabetes (T2D), obesity and their complications have become global public health problems. Additionally, childhood obesity and its co-morbid conditions have reached epidemic proportions. In the US, there exist remarkable disparities in the occurrence of these diseases, and minority groups including Mexican Americans (MAs) are more likely to develop T2D and its related diseases than the general population. T2D and related traits are complex diseases that are influenced by genetic and environmental factors and their interactions. Over the past 25 years, we have examined the genetics of T2D, obesity and their related traits in MAs using information from large families that are part of the San Antonio Mexican American Family Studies (SAMAFS, N=~2,800). Using advanced genetic and genomic technologies, we have localized genetic variants influencing T2D and its related traits. In addition, information from other OMICs studies have been utilized to aid in disease gene discovery. The ultimate goal of these studies is to translate the genetic findings into clinically relevant information for improved treatment or cure for T2D or its related diseases. Aside from these studies, we evaluated the burden of childhood obesity in MAs using data from the San Antonio Family Assessment of Metabolic Risk Indicators in Youth (SAFARI) study (N=673, 6-17 years). These data revealed that many SAFARI children are headed early toward T2D-related health problems. Occurrence of childhood obesity related risk factors this early in life significantly increases risk of developing T2D/related health problems years earlier than might otherwise have been expected. We have been assessing environmental factors (e.g., diet and physical activity) that influence childhood obesity in SAFARI children in order to conduct intervention studies to improve health. In this talk, I will discuss our ongoing genetic studies at the South Texas Diabetes and Obesity Institute (STDOI) and their translational potential for improved health as they relate to the Rio Grande Valley community.





# Oral Presentation Schedule

## Clinical Disciplines Group A | Time: 9:00-11:30 a.m.

Location: Conference Room 1

Aguirre, Maria T.	THE ROLE OF THE CLINICAL LABORATORY IN IDENTIFYING ADVERSE EFFECTS RELATED TO ENERGY DRINKS
Alvarado, Joy	A COMMUNITY-BASED APPROACH TO ESTABLISHING THE GOALS AND OBJECTIVES OF A STUDENT-RUN CLINIC
Aude, Y. Wady	CLINICAL FEATURES AND SHORT-TERM OUTCOMES OF TAKOTSUBO (STRESS) CARDIOMYOPATHY IN SOUTH TEXAS HISPANICS
Hirani, Zishan	A MULTIDISCIPLINARY COLLABORATION TO DECREASE THE PRIMARY CESAREAN SECTION RATE AT A NEW ACADEMIC MEDICAL CENTER
Narapureddy, Sravan	ESTABLISHING A STUDENT RUN CLINIC IN AN UNDERSERVED SOUTH TEXAS COLONIA – A PILOT MODEL
Rapoport, Grigoriy	THE SAFETY OF PULMONOLOGIST PERFORMED SONOGRAPHY--GUIDED THORACENTESIS IN THE OFFICE SETTING

## Diabetes | Time: 9:00-11:30 a.m.

Location: Conference Room 2

Berger, Marc	HBA1C TIME INTEGRAL, "CAMI," AS A PREDICTOR OF DIABETIC COMPLICATION RISK
Bulga, Alexandra Ramirez, Noe	DIABETES CYTOKINE MARKERS OF METABOLIC HEALTH AND OBESITY ADAPTATION TO DIABETES: A PSYCHOSOCIAL-MENTAL HEALTH PERSPECTIVE WITH RECOMMENDATIONS FOR RESEARCH AND INTER-PROFESSIONAL EDUCATION ADDRESSING BORDER HEALTH ISSUES
Rollins, Derrick	POWERFUL MODEL-BASED ARTIFICIAL PANCREAS PREDICTIVE CONTROL APPROACH
Russel, Ryan	SKELETAL MUSCLE MICROVASCULAR-LINKED IMPROVEMENTS IN GLYCEMIC CONTROL FROM RESISTANCE TRAINING IN INDIVIDUALS WITH TYPE 2 DIABETES RUNNING
Sarkar, Kamal	DEVELOPMENT OF AN INNOVATIVE SMART DIABETIC SHOE INSERT (SDSI) TO MONITOR PROGRESSION OF DIABETES IN REAL TIME

## Global and Public Health | Time: 9:00-11:30 a.m.

Location: Conference Room 3

Diaz Badillo, Alvaro	GENE EXPRESSION PROFILES ASSOCIATED WITH ARBOVIRAL INFECTIONS IN A US-MEXICO BORDER POPULATION: A STUDY DESIGN
Nunez--S, Abigail	TRAUMA AND HEALTH AMONG RECENT REFUGEES AND IMMIGRANT ADULTS AND CHILDREN FROM CENTRAL AMERICA
Ronnau, John P.	ASSESSMENT RESULTS AND LESSONS-LEARNED FROM THE INTERPROFESSIONAL EDUCATION (IPE), COMMUNITY UNIVERSITY PARTNERSHIP/UTRGV HUBS---YEAR ONE
Zemrani, Aziza Zeng, Guang	SDGS AND GLOBAL HEALTH AND UTRGV LEADERSHIP ROLE SCHOOLS AS THE FOCAL POINT FOR CHILD MENTAL HEALTH PREVENTION IN THE U.S.: A NATIONAL POLICY PERSPECTIVE

## Biomedical/Basic Science | Time: 9:00-11:30 a.m.

Location: Conference Hall A&B

Colon Echevarria, Claudia	ADRENERGIC MODULATION OF PRO-INFLAMMATORY RESPONSES IN OVARIAN CANCER
Goldblatt, David	TOLL-LIKE RECEPTOR-2/6 AND TOLL-LIKE RECEPTOR-9 AGONISTS SUPPRESS VIRAL REPLICATION AND CHRONIC ASTHMA IN MICE
Kazansky, Alexander	NOVEL NANOTECHNOLOGY APPROACH TO TARGET CANCER-SWITCH FROM PROTO-ONCOGENE TO TUMOR SUPPRESSOR.
Mummidi, Srinivas	GENETIC DETERMINANTS OF SERUM CAROTENOID CONCENTRATIONS AND THEIR RELATIONSHIP WITH OBESITY AND RELATED TRAITS IN MEXICAN AMERICAN CHILDREN
Zhang, Yonghong	CA2+-MEDIATED ACTIVATION OF ESTROGEN RECEPTOR-A BY CALMODULIN

## Clinical Disciplines Group B | Time: 1:00--3:30 p.m.

Location: Conference Room 1

Bernal, Silva Sofia Illades--Aguiar, Berenice Munoz, Maria de Jesus	CERVICAL CANCER AND IMMUNITY CERVICAL CANCER AND HPV IN SOUTHERN MEXICO CAN AN EDUCATIONAL INTERVENTION AND PROMPT IN THE ER GENERAL COMPLIANT TEMPLATE, IMPROVE COMPLIANCE WITH THE DIABETIC FOOT EXAM IN THE CLINICAL SETTING.
Pareja, Heidi Y. Uddin, M. Jasim	PREGNANCY CARD: A TOOL OF THE PAST OR STILL NEEDED? SYNTHESIS, CHARACTERIZATION AND IN VITRO CYTOTOXICITY OF PT(ACAC)2-TIO2 NANOMEDICINE

## Neuroscience | Time: 1:00--3:30 p.m.

Location: Conference Room 2

Choi, Yoonsu	BIOCOMPATIBLE MICROCHANNEL SCAFFOLD WITH MICROWIRES FOR RECORDING REGENERATIVE PERIPHERAL NERVE NEURAL SPIKES
Ragland, Victoria Sandoval, Adrian	CIRCADIAN RHYTHMS AND AGEING SPICE UP YOUR LIFE WITH K2—AN OVERVIEW OF SYNTHETIC CANNABINOIDS
Weary, Chabeli	GENETIC VARIANTS IN CCSER1 GENE ASSOCIATED WITH ALZHEIMER'S DISEASE

## Genomics | Time: 1:00--3:30pm

Location: Conference Room 3

Arya, Rector	EVIDENCE FOR COMMON GENETIC LOCI FOR BIRTH WEIGHT AND ADULTHOOD CARDIO-METABOLIC TRAITS IN MEXICAN AMERICANS
Fofana, Demba Garcia--Hernandez, Antonio	HYBRID-NETWORK: A BAYESIAN APPROACH TO GENE EXPRESSION DATA A VECTOR SUBSPACE COMPARISON APPROACH TO STUDY THE PERTURBATION OF GENE EXPRESSION NETWORKS IN RESPONSE TO AGING
Oyervides--Munoz, Mariel Araceli Rodriguez Gutierrez, Hazyadee Frecia	GENOMIC BIOMARKERS STUDY FOR CERVICAL CANCER PREDICTION. RISK OF BREAST CANCER.





# Oral Presentations

## Clinical Disciplines

### SESSION I, GROUP A | LOCATION: CONFERENCE ROOM 1

#### THE ROLE OF THE CLINICAL LABORATORY IN IDENTIFYING ADVERSE EFFECTS RELATED TO ENERGY DRINKS

*Maria T. Aguirre, MS, MT, ASCP and Sandra L. Tijerina, MS, MLS(ASCP)cm, SBB, SH(ASCP)cm Department of Biomedicine, College of Health Affairs, University of Texas Rio Grande Valley, 1201 West University Drive, Edinburg, Texas.*

Objective: To provide insight into energy drinks and their consumption in the US, their ingredients, their effects on certain populations, and how certain laboratory tests help in the identification of possible toxicity or adverse effects. Research Methods and Procedures: Literature review includes published articles on toxicity and death due to over use or adverse effects and data published by the National Health and Nutrition Examination Survey (NHANES) 2007-2010 and by Drug Abuse Warning Network, a public health surveillance system, among other articles. Results: The active ingredient in energy drinks is caffeine. Energy drinks contain, on an average, 242 mg of caffeine per serving which is about half of the amount recommended by the World Health Organization. Depending on caffeine tolerance and quantity consumed, caffeine can have different effects on different individuals. The most notable risk factors are sex, age, shift-work, history of mental illness, military personnel, and history of heart disease. The best laboratory tests would be a Complete Blood Count, a drug and alcohol test, total CK (creatinine kinase), urinalysis, glucose, serum pregnancy, thyroid, arterial blood gas and kidney function tests, serum theophylline (a bronchodilator). A test for caffeine is not recommended as this is usually performed at a reference lab with 2-5 day turnaround time. Conclusion: There are many different brands of energy drinks on the market at present, and many misconceptions about the benefits they provide. This study provides factual information regarding their use and benefits or adverse effects. This research was non-funded.

### SESSION I, GROUP A | LOCATION: CONFERENCE ROOM 1

#### A COMMUNITY-BASED APPROACH TO ESTABLISHING THE GOALS AND OBJECTIVES OF A STUDENT-RUN CLINIC

*Julien Mahler<sup>1</sup>, Joy Alvarado MHS<sup>1</sup>, Nery Guerrero<sup>1</sup>, Joseph Boateng<sup>1</sup>, Sravan Narapureddy MS<sup>1</sup>*

*<sup>1</sup> University of Texas Rio Grande Valley School of Medicine*

Colonias are communities along the Texas-Mexico border that are federally classified as "economically distressed." In Hidalgo county, which has the largest number of colonia residents in Texas, twice as many people live without health insurance than the national average, and more than a third live below the poverty line. To provide a sustainable source of high-quality health care to patients in need, the University of Texas Rio Grande Valley School of Medicine is partnering with Proyecto Desarrollo Humano, a nonprofit organization, to establish Vaquero Clinica de Salud, a potential student-run free health clinic in Pueblo de Palmas, a colonia in Hidalgo county. A health needs assessment, including focus groups and a self-reported survey, will be conducted to establish the goals and objectives of the clinic. The results of three focus groups will be presented, each with different types of participants: one with colonia residents, one with community health workers, and one with the leaders of Proyecto Desarrollo Humano. Through qualitative analysis, we aim to identify the major health concerns for colonia residents, the expectations of community leaders in opening a new clinic, and the educational value for medical students working in an underserved area. The results from these focus groups will help us to develop the student-run clinic in a way that prioritizes community needs while providing an exceptional learning experience for students. Based on the results, we may adjust clinic development to better align with newly-discovered community goals. Ultimately, we hope this experience will help create a united front between our medical school and key community partners against prevailing health issues in local colonias.

### SESSION I, GROUP A | LOCATION: CONFERENCE ROOM 1

#### CLINICAL FEATURES AND SHORT-TERM OUTCOMES OF TAKOTSUBO (STRESS) CARDIOMYOPATHY IN SOUTH TEXAS HISPANICS

*Cesar Gutierrez, MD<sup>1</sup>, Chi Lun Pui, MD<sup>1</sup>, Galyna Ivashchuk, MD<sup>1</sup>, Carlos Aude<sup>2</sup>, Y. Wady Aude, MD<sup>1,3</sup>*

*<sup>1</sup> The University of Texas Rio Grande Valley and Doctors Hospital at Renaissance (DHR), Edinburg, TX; <sup>2</sup> Science Academy of South Texas, Mercedes, TX; <sup>3</sup> Heart and Vascular Specialists (HVS), McAllen, TX*

Background: Takotsubo cardiomyopathy (TSC) predominantly affects post-menopausal women, and is preceded by emotional or physical stress, or no identifiable trigger. Previous studies have suggested that TSC is mainly preceded by emotional triggers, but this was not confirmed by recently published data from the International Takotsubo Registry (ITR). We suspected that TSC is predominantly caused by emotional stress in South Texas Hispanics (STH). Objectives: The aim of this study was to investigate the clinical features and the short-term outcomes of TSC in STH. Methods: Data were collected from medical records of patients diagnosed with TSC at DHR (2005-2017) and from office records of HVS (2014-2017). Coronary angiography was performed in all the patients. Results: Of 41 patients with TSC, the diagnosis was confirmed in 38, of which 27 (71.1%) were Hispanics. In this group, the mean ( $\pm$ SD) age was  $69 \pm 11.5$ , 92.6% were women, the most common presenting symptoms were chest pain (66.7%) and shortness of breath (48.2%). Physical, emotional and no specific triggers were identified in 37.4%, 33.3% and 29.6% of the patients, respectively. Cardiogenic shock and respiratory failure occurred in 37% and 25.9% of the patients, respectively. There were no in-hospital deaths in the entire cohort. Conclusion: Clinical features of TSC in STH are similar to those published by the ITR. Emotional triggers are not as common as initially thought. The rate of severe in-hospital complications occurred in at least one-third of the patients, but there were no deaths.

**SESSION I, GROUP A | LOCATION: CONFERENCE ROOM 1  
A MULTIDISCIPLINARY COLLABORATION TO DECREASE THE PRIMARY CESAREAN SECTION RATE AT A NEW ACADEMIC MEDICAL CENTER**

Zishan A. Hirani, MD, MS1, Roberto Prieto-Harris, MD1, Carlos Ballesteros, MD1, Anabelle Hernandez, RN2, Aida Martinez-Gonzalez, MSN2, Lilianna Padilla-Williams, MD1 1 UT RGV SOM, Edinburg, TX; 2 Women's Hospital at Renaissance, Edinburg, TX

Introduction Doctors Hospital at Renaissance (DHR) performs over 9,000 deliveries per year with a primary cesarean birth rate of 35%. It is the primary teaching site for the new OBGYN residency program at the University of Texas Rio Grande Valley. Prompted by Joint Commission, Leapfrog and CMS efforts to decrease the primary cesarean birth rate, two faculty and two first year residents developed a multidisciplinary project to decrease rates. Methods The team was led by two community faculty and included two residents, nursing and hospital administration. Interventions included mandatory completion of a FHR course, standardization of terminology, provider education on terminology and recommended interventions, and monthly reporting of overall and individual C/S rates. The team used a fishbone analysis of the steps leading to a cesarean section to create a data collection checklist. Charts were reviewed by the two residents to confirm the indication for C/S along with the responsible attending, nurse, day of week and time of delivery. Results The primary cesarean birth rate decreased from 35% in the first quarter of 2015, to 27% in the first quarter of 2016, a 24% decrease. The project team continues to meet quarterly to discuss ongoing activities necessary to maintain and increase the improvement observed in the initial quarter. Conclusion/Implications Developing policies through Interdisciplinary partnership between OBGYN residents/faculty and hospital administration can ensure patients receive the highest quality and safest care during the labor process. In our quality improvement initiative, we achieved this goal by successfully reducing the rate of primary cesarean sections.

**SESSION I, GROUP A | LOCATION: CONFERENCE ROOM 1  
ESTABLISHING A STUDENT RUN CLINIC IN AN UNDERSERVED SOUTH TEXAS COLONIA – A PILOT MODEL**

Pravara Narapureddy, MS1, Joseph Boateng1, Joy Alvarado, MHS1, Julien Mahler1, Nery Guerrero1  
1 University of Texas Rio Grande Valley School of Medicine

Individuals who lack health insurance are less likely to use healthcare services and have an overall decline in health. In Hidalgo County, 34% of individuals lack health insurance, which is more than double the national average. Hidalgo county is also considered a medically underserved area with only 50 primary care physicians per 100,000 population. Medical schools around the nation have sought to combat healthcare issues in underserved communities with student-run clinics that operate with faculty supervision. These clinics serve uninsured populations, while teaching medical students clinical skills and the values of interprofessionalism, social responsibility, and leadership. To treat the uninsured and underserved populations of Hidalgo County while striving for social accountability, the medical students and staff of the University of Texas Rio Grande Valley (UTRGV) School of Medicine are partnering with Proyecto Desarrollo Humano to take a novel approach in establishing a student-run free clinic in Peñitas, Texas. The development of a student-run clinic includes many steps, not limited to: selecting a clinic site, gathering patient demographics, establishing partnerships, creating a logic model, and developing operational policy and procedures. The overall goal of the UTRGV student-run clinic is to develop a successful and sustainable system to improve the healthcare of underserved local areas, while serving as a replicable model for other underserved areas in the nation. The unique challenges to establishing a student-run clinic in the colonias of South Texas can also provide an exceptional educational opportunity for students learn about the specific healthcare gaps present in underserved populations, while creating a lasting partnership between a medical school and its community.

**SESSION I, GROUP A | LOCATION: CONFERENCE ROOM 1  
THE SAFETY OF PULMONOLOGIST PERFORMED SONOGRAPHY-GUIDED THORACENTESIS IN THE OFFICE SETTING**

Grigoriy Rapoport, Ph.D., The University of Texas Rio Grande Valley, School of Medicine

Pleural effusions are commonly encountered and their characterization key for clinical management. The purpose of this study is to examine the safety of ultrasound guided thoracentesis by pulmonologists in an office setting. We conducted a retrospective chart review of patients undergoing thoracentesis between January 1st 2014 and December 31st 2016 in a pulmonary practice. All procedures were performed with sonographic guidance utilizing a 3.5 MHz probe and Sonosite Titan equipment. Only Arrow thoracentesis kits were utilized. Pleural fluid was drained by gravity. Vitals signs were recorded prior to and after interventions. Pleural drainage was stopped at the discretion of the proceduralist. Chest sonography was utilized to rule out pneumothorax after intervention. In total, 190 thoracenteses were performed on 100 patients (60 males, 40 females). Age ranged between 42 to 100 years. Indications included decompensated heart failure (n=36, 75 procedures), post CABG effusions (n=9, 20 procedures), effusions associated with renal failure (n=11, 26 procedures), liver cirrhosis (n=7, 11 procedures), pulmonary hypertension (n=6, 10 procedures), malignancies (n=19, 25 procedures), and miscellaneous. Total fluid removed ranged from 250 to 2,000 mL, average 1,153 mL. Complications: cough (13%), chest pain (4%), dyspnea (0.05%). No hypotension, vasovagal reaction, pneumothorax or bleeding occurred. We demonstrate the safety of ultrasound-guided thoracentesis as part of regular services in a busy office setting, and support the use of chest sonography to rule out pneumothorax after intervention. We confirm the safety of large volume pleural drainage in high-risk patients using our approach. No increase in complications was noted based on volume of fluid removed and incidence of pain and cough compared with current literature. No pneumothoraces were identified. Sonographic-guided thoracentesis is safe, preferred by patients, cost-effective, and feasible in a busy clinical setting as performed by trained pulmonologists.

## Clinical Disciplines - Session II

**SESSION II, GROUP B | LOCATION: CONFERENCE ROOM 1  
CERVICAL CANCER AND IMMUNITY**

Bernal-Silva Sofia2,4, Rangel-Ramirez Velia1, Jimenez-Esquivel Margarita3, Noyola DE2,4, Zermeño-Nava JJ5, García-Guerrero FI5, González-Amaro Roberto1,4, Layseca-Espinosa Esther1,4 1Departments of Immunology and 2Microbiology, School of Medicine, Universidad Autónoma de San Luis Potosí, San Luis Potosí, SLP, México. 3Department of Gynecological Oncology, Hospital Central “Dr. Ignacio Morones Prieto, San Luis Potosí, SLP, México. 4Research Center for Health Sciences and Biomedicine, Universidad Autónoma de San Luis Potosí, 5Hospital Central “Dr. Ignacio Morones Prieto”, San Luis Potosí, SLP, México.

The etiologic agent of CC is the human papillomavirus (HPV) and the cellular immune response against HPV infection is determinant for viral clearance. The innate NK cells are a set of lymphocytes whose function includes the destruction of virus infected and tumor cells. The activation of NK cells and effector activity occurs through a complex interaction between activating and inhibitory receptors found on the surface of these cells. Currently it is not known precisely the effect that may have HPV infection in NK cells or viceversa, and there is not enough information to show how they are affected and how this affect the progression of HPV infections and its premalignant lesions. Therefore the aim of our work focuses on studying the phenotype of NK cells in women with cervical cancer and precancerous lesions of the cervix caused by HPV. As part of the work, we did the detection and genotyping of HPV in samples of cervix of one hundred women and the receptor expression was measured by flow cytometer in NK cells with the collaboration of the Immunology Department of the UASLP Medicine School. One hundred women were studied and divided into five groups: 1) HPV negative healthy women, 2) HPV positive healthy women, 3) LSIL, 4) HSIL and 5) CC, with N=20 per group. Among the receptors repertoire, we found an increased percentage of ILT2+ cells as the HPV infection progress toward cancer. On the other hand, it is of particular interest the role of viral infections as potential risk cofactors for developing the disease. It is possible that some mechanisms caused by CMV infection to evade the immune system could give an advantage to the infected cell that is also infected with HPV to thereby evade immune surveillance and produce a persistent infection.

**SESSION II, GROUP B | LOCATION: CONFERENCE ROOM 1  
CERVICAL CANCER AND HPV IN SOUTHERN MEXICO**

Luz del Carmen Alarcón-Romero1, PhD, Julio Ortiz-Ortiz1, PhD, Oscar Del Moral-Hernández1, PhD, Daniel Hernández-Sotelo1, PhD, Miguel Ángel Mendoza-Catalán1, PhD, Eugenia Flores-Alfaro1, PhD, Marco Antonio Leyva-Vázquez1, PhD, Berenice Illades-Aguilar1, PhD. 1Faculty of Biological Chemistry of the Autonomous University of Guerrero (UAGro), Mexico.

Cervical cancer (CC) is the most common type of cancer among women between 14 and 44 years of age in Mexico and southern Mexico has the highest mortality rate. The primary cause of CC is persistent infection with high risk HPV The oncogenicity of HPV depends on the genotypes and their variants, however, only a small fraction of women with HPV infection may progress to CC. This behavior is linked to immunity, host genetics, viral, cellular and environmental factors. There is evidence that some biomarkers have potential usefulness to distinguish between transient and carcinogenic HPV infections, but currently there are no routinely used markers to achieve this distinction. From 9,200 cervical samples of women from southern Mexico, obtained from 1997 to 2016, with CC, HSIL, LSIL and normal cytology diagnosis, stored in UAGro biobank, HPV prevalence, HPV 16 viral load, integration and variants were determined. TOP1A/MCM2, P16INK4a, cyclin E1, K1-67 and telomerase were determined by immunocytochemistry in samples with high-risk HPV. The most prevalent HPV types in CC were HPV16, followed by HPV 18, HPV 31, HPV 45 and HPV 58. In this population, high viral load and E6 HPV 16 variants Aa-a, E-A176/G350, AA-c, E-G350 and E-C188/G350 showed risk of developing CC, therefore they are potential viral markers of lesion progression. Analysis of TOP1A/MCM2, P16INK4a, cyclin E1, K1-67 and telomerase showed that they are potential cellular biomarkers for identification of cervical lesions with higher risk of progression to CC in women from southern Mexico.

**SESSION II, GROUP B | LOCATION: CONFERENCE ROOM 1  
CAN AN EDUCATIONAL INTERVENTION AND PROMPT IN THE EHRGENERAL COMPLIANT TEMPLATE, IMPROVE COMPLIANCE WITH THE DIABETIC FOOT EXAM IN THE CLINICAL SETTING?**

María de Jesús Muñoz, MD, Department of Family and Community Medicine, The University of Texas Rio Grande Valley, School of Medicine

According to the CDC, from 1980 to 2014, the number of adults in the United States aged 18–79 with newly diagnosed diabetes more than tripled from 493,000 in 1980 to more than 1.4 million in 2014. 29.1 million people or 9% of the population have Diabetes, and another 8.1 million are diagnosed (1). We have learned from numerous studies, that we can reduce both macrovascular and microvascular complications with tight glucose control, blood pressure and lipid control in Type II Diabetics (2). In the general population, 45 years and older, the incidence of vascular lower limb amputations at or proximal to the transmetatarsal level is eight times higher in Diabetic individuals compared to non-diabetic individuals, and what is worse is that one in four amputees may require contralateral or re-amputation (3). Regular foot exams play a major role in early detection of foot problems and may help prevent amputations and hospitalizations (4,7,9). Furthermore, educating patients on how to take care of their feet makes them more pro-active in their care and may prevent them from having an amputation in the future (5,6,8,10). Recognizing the importance of the foot exam in the care of Diabetic individuals, this study will look at the rates of compliance in performing Diabetic foot exams from medical professionals when provided additional education on the need and the procedures, and when given a prompt in the EMR.



**SESSION II, GROUP B | LOCATION: CONFERENCE ROOM 1  
PREGNANCY CARD: A TOOL OF THE PAST OR STILL NEEDED?**

*Heidi Pareja, MD1,2, Oksana Marroquin, MD1,2, Baldemar Gonzalez, MD1,2, Natividad Rangel-Hinojosa, MEd2*

*1. Family Medicine Residency Clinic, McAllen, TX 2. University of Texas Rio Grande Valley, McAllen, TX*

The number of US infant deaths in 2013 was 23,446. Prenatal care continues to be the primary way to identify problems during pregnancy. Investigators believe that using a pregnancy card at the residency clinic will improve compliance with ordering the recommended studies and vaccines. Methods: Investigators performed a retrospective 2-year period chart review of all 177 pregnant women (18 years and older) who were seen by the residents at the McAllen Family Medicine Residency Clinic. They measured if the required studies and vaccines were done. After data collection, all pregnant patients receive a Pregnancy Card to keep and bring to each visit. Statistical quantitative analyses were done to obtain: description of the sample and physician compliance on ordering required labs. Results: A total of 151 charts were analyzed; 26 patients were excluded due to: no follow-up, transferred care, and loss of pregnancy. The age range: 18-42 years old. 26% (39/151) of the charts had 100% of the required tests completed. The Pareto chart of defects highlighted that 27% (75/151) of the charts were missing influenza vaccine and 21% (59/151) Tdap vaccine. Conclusion: Investigators found a big deficiency of 100% compliance of physicians ordering the required studies. The Pareto chart of defects highlights the two areas where efforts should be placed: providing Tdap and influenza vaccines to pregnant patients. Investigators agree that using the Pregnancy Card can improve compliance and serve as a checklist to ensure that required tests get done at the appropriate time. Future Direction: After one year of implementing the card, do another chart review to compare compliance.

**SESSION II, GROUP B | LOCATION: CONFERENCE ROOM 1  
SYNTHESIS, CHARACTERIZATION AND IN VITRO CYTOTOXICITY OF PT(ACAC)2-TIO2 NANOMEDICINE**

*M. J. Uddin, T. López, M. Alvarez, R. D. González, J. Bustos, S. Arroyo, A. Sánchez, T. López and J. Bustos*

*M.J. Uddin, (Present) Department of Chemistry, University of Texas Rio Grande Valley, Departamento de Atención a la Salud, Universidad Autónoma Metropolitana Xochimilco, Calz. Del Hueso 1100, Villa Quietud, Coyoacán, 04960, México, D.F.,*

*Mexico, T. López ( ) · M. Alvarez · S. Arroyo Laboratorio de Nanotecnología, Instituto Nacional de Neurología y Neurocirugía, Av. Insurgentes sur 3877, La Fama, 14269, Tlalpan, México, D.F., Mexico, M.J. Uddin, T. López · R.D. González, U. Diebold*

*Department of Chemical Engineering, Department of Physics, Tulane University, New Orleans, LA 70118, USA, M.J. Uddin, U. Diebold · Department of Chemical Engineering, Department of Physics, Tulane University, New Orleans, LA 70118, USA*

*A. Sánchez Laboratorio de Patología experimental, Instituto Nacional de Neurología y Neurocirugía, Av. Insurgentes sur 3877, La Fama, 14269, Tlalpan, México, D.F., Mexico*

Abstract: The adverse toxicological profile of cisplatin (cis-dichlorodiammineplatinum (II)), characterized by nephrotoxicity and neurotoxicity is the main factor that limit the clinical usefulness of this antineoplastic drug, specifically the possibility of applying it in effective high-dose regimens. In order to overcome these disadvantages, many efforts in the search for new drugs have been made. Due to this particularity, we obtained via sol-gel process Pt(acac)2-TiO2 (NPt) nanostructured materials with antitumoral activity to be used as an alternative in the treatment of cancer tumors. The biocatalysts were prepared by the sol-gel route using the complex Pt(acac)2. Sol-gel parameters were controlled in order to obtain high platinum dispersion and particles in the nano-size range. TEM, FTIR, N2 adsorption and XPS characterization studies of the samples were carried out. In order to investigate interactions between the biocatalyst and DNA, agarose gel electrophoresis was performed, and we observed the formation of DNA adducts. 45 minutes after contact, NPt completely degraded the DNA (cisplatin 120 minutes). These results demonstrate that using a metal supported and dispersed over an inorganic biocompatible oxide, can be effectively used in the treatment of localized tumors.

## DIABETES

**SESSION I | LOCATION: CONFERENCE ROOM 2  
HbA1c TIME INTEGRAL, “CAMI,” AS A PREDICTOR OF DIABETIC COMPLICATION RISK.**

*Marc S. Berger, MD,CM FAAFP, Department of Family Medicine, The University of Texas Rio Grande Valley*

The HbA1c\*months integral (CAMI for diabetes Cumulated A1C Months Index) is a untested statistic that MAY help monitor chronic diabetic care. The Cumulated A1c\*Months Index (CAMI) is generated from review of a list of Hemoglobin A1C laboratory values on an individual patient; this is easily calculated. CAMI is the sum of every available hemoglobin A1C reading less the normal value of 6.5% that has been measured multiplied by the number of Months (rounded) in between that hemoglobin A1C and the previous measured value. It is thus a second integral of blood sugar with respect to time; HbA1c is an integral of average blood sugar for 3 months, and the CAM statistic is the time integral of the HbA1C. CAMIn= CAMI n-1 + (months between present and previous hbA1c)\* (present HbA1c-6.5%) This presentation will look at calculating the CAMI for individual patients. If it appears to be useful, a long term validation study will be needed to see if this statistic can be used to predict future diabetic complications such as nephropathy.

**SESSION I | LOCATION: CONFERENCE ROOM 2  
DIABETES CYTOKINE MARKERS OF METABOLIC HEALTH AND OBESITY**

*Alexandra Bulga, BS1, Susan P. Fisher-Hoch, MD2, Joseph B. McCormick, MD2 1UT Rio Grande Valley School of Medicine, Edinburg, Texas; 2UT School of Public Health, Brownsville Regional Campus, Brownsville, Texas*

Background: Previous research by Wu et al. characterized the risk of diabetes within the Cameron County Hispanic Cohort, a randomly selected Mexican American cohort in Texas along the US-Mexico border. Participants were grouped based on metabolic health and BMI and divided into the following categories: metabolically healthy normal weight, metabolically healthy overweight/obese, metabolically unhealthy normal weight, and metabolically unhealthy overweight/obese. Overweight/obese status was determined as a BMI of 25kg/m2 or higher and metabolic health was defined as having less than two metabolic abnormalities. In the population studied, the prevalence of diabetes was shown to be 40.3% in participants characterized as overweight/obese metabolically unhealthy, and 36.1% in non-obese metabolically unhealthy individuals. We also have shown the adiponectin/leptin ratio correlated significantly with the development of Metabolic Syndrome in this population. Objective: Characterize the 4 groups by presence of pro-inflammatory and anti-inflammatory cytokines. Methods: We are performing multivariable regression analysis of pro- and anti-inflammatory cytokine markers and mapping the cytokine profiles of each of these four categories. Results: Our data indicates that diabetes is strongly associated with elevated levels of IL-6, leptin, CRP and TNF-α, while worsening glucose control is positively and linearly associated with high levels of IL-6 and leptin. The data for each of the metabolic groups will be presented to identify the inflammatory pathways that may be associated with the metabolic groups. This and future studies are part of a larger effort to more fully characterize type 2 diabetes in our cohort. Funding by National Center on Minority Health and Health Disparities (MD000170-P20) and Center for Clinical and Translational Sciences (UL1-TR000371).

**SESSION I | LOCATION: CONFERENCE ROOM 2  
ADAPTATION TO DIABETES: A PSYCHOSOCIAL-MENTAL HEALTH PERSPECTIVE WITH RECOMMENDATIONS FOR RESEARCH AND INTER-PROFESSIONAL EDUCATION ADDRESSING BORDER HEALTH ISSUES”**

*Noe Ramirez, Ph.D., LCSW, Associate Professor UTRGV Social Work Department*

OBJECTIVE(S): The presentation’s objective is to disseminate an understanding of obesity and diabetes from a psychosocial and mental health perspective, which is an approach utilized by inter-disciplinary professionals in medical health care and mental health settings to understand the condition, client, patient, or person from a holistic framework. The content covers the relation between obesity and diabetes, as a medical complication, and the outcome it has on the person’s awareness, mental health or cognitive level, and subsequent adaptation to the condition. The content will provide information on obesity and diabetes and highlighting major functions involved in the delivery of services to persons with the condition, including: (1) psychosocial assessment involving collecting data by inter-disciplinary teams on the person’s demographics (literacy, age, developmental stage, occupation, household size), in addition to cultural background and its influence on the condition, awareness of the condition and outlook on nutritional intake, knowledge and availability of resources to utilized to help the client; (2) intervention involving treatment via psychosocial education, problem-solving, application of advocacy, networking, and counseling, and prevention roles; and (3) termination involving discharge planning, brokering resources, follow-up evaluation, and outreach. SETTING(S): The topic will be presented in the context of health, clinical, and social services settings with emphasis on the assessment and treatment of obesity and diabetes in interdisciplinary settings involving multiple health, social services, and other professionals and service providers in the Rio Grande Valley, UTRGV and its Centers focusing on health along the border. PROGRAM DESCRIPTION: The presentation will discuss a program that is “work-in-progress” in view of the how the psychosocial perspective emphasizes that throughout the intervention process the psychosocial assessment is revised continually as new information is acquired, as circumstances and goals change, and as progress toward goals is made. OUTCOME(S): Outcomes are presented as they have been identified by this author’s inquiry on the subject of obesity and diabetes, based on its conceptualization and its investigation which is grounded on the literature, personal observation in the Rio Grande Valley, clinical practice, and social work education. LESSONS LEARNED: The lessons learned from the author’s inquiry into the subject will be reported, hypothesizing about the relationship between obesity and diabetes as a physical/medical health condition and its relation to the psychosocial and mental health perspective utilized in inter-disciplinary clinical practice settings. IMPLICATIONS FOR INTERDISCIPLINARY-RESEARCH: The presentation will identify and discuss implications for improving the understanding of the obesity and diabetes with interdisciplinary-based research involving empirical studies utilizing quantitative and qualitative methodology to improve treatment models and approaches to prevention and education and to meet the challenges and opportunities for understanding health care issues along the border.

**SESSION I | LOCATION: CONFERENCE ROOM 2  
POWERFUL MODEL-BASED ARTIFICIAL PANCREAS PREDICTIVE CONTROL APPROACH**

*Yong Mei, PhD, Derrick K. Rollins, Sr., PhD Iowa State University, Ames, Iowa USA*

The objective is the development of a novel artificial pancreas (AP) control approach that overcomes critical limitations of model-based predictive control approaches to tighten blood glucose concentration (BGC) for around-the-clock use. This approach uses a novel modeling method to predict BGC very accurately a distance into the future (i.e., 30 to 60 minutes) when insulin changes begin to affect BGC. This future virtual BGC sensor is used in the place of measured BGC in the feedback error (set point – BGC), and a classical PID controller changes insulin in the present to minimize this difference the future. This approach does not require a model for the relationship of insulin on BGC. High accuracy is achieved for one week of test data per each of 11 subjects. The superiority of our feedback predictive control (FBPC) method over MPC is demonstrated in two studies – CSTR simulator with unmeasured disturbances and diabetes simulator for 30 subjects. For 30 and 60 minutes-ahead-predictions (MAP) on the 11 subjects, model bias was nearly negligible for all cases and correlations between the measured and fitted BGC (rfit) were 0.93 and 0.83, with highs of 0.96 ad 0.88, for 30 and 60 MAP, respectively. In both studies, FBPC greatly outperformed MPC as measured by the standard deviation (SD) about the target. In the CSTR study, the SD of FBPC was 38% lower than MPC and in the diabetes simulator study, the SD of FBPC was 21% lower than MPC on the average. Thus, FBPC, using our modeling methodology, has the potential to advance AP research significantly by overcoming current limitations in modeling and control. The next step is clinical trials for a proof-of-concept. JDRF funded this work.

**SESSION I | LOCATION: CONFERENCE ROOM 2**  
**SKELETAL MUSCLE MICROVASCULAR-LINKED IMPROVEMENTS IN GLYCEMIC CONTROL FROM RESISTANCE TRAINING IN INDIVIDUALS WITH TYPE 2 DIABETES RUNNING**

*Ryan D. Russell, PhD1, Donghua Hu1, Timothy Greenaway, MD PhD2,3., Sarah J. Blackwood1, Renee M. Dwyer3, PhD, James E. Sharman PhD1, Graeme Jones M.D. PhD1., Kathryn A. Squibb PhD1., Aascha A. Brown1, Petr Otahal1, Meg Boman2, Hayder Al-Aubaidy PhD3., Dino Premilovac, PhD3., Christian K. Roberts, PhD4., Samuel Hitchins MD3, Stephen M. Richards PhD3, Stephen Rattigan, PhD.1, Michelle A. Keske, PhD1. 1 Menzies Institute for Medical Research, University of Tasmania, Hobart, Australia 2 Royal Hobart Hospital, Hobart, Australia 3 School of Medicine, University of Tasmania, Hobart, Australia 4 Department of Kinesiology, Occidental College, Los Angeles, USA*

Aims/Hypothesis: Insulin increases glucose disposal in part by enhancing microvascular blood flow (MBF) and substrate delivery to myocytes. Insulin's microvascular action is impaired with insulin resistance and type 2 diabetes (T2D). Resistance training (RT) improves glycemic control and insulin sensitivity, but whether this improvement is linked to augmented skeletal muscle microvascular responses in T2D is unknown. Methods: Seventeen (11M/6F; 52 ± 2 yr) sedentary T2D patients underwent s of whole body RT. Before and after RT, overnight fasted participants had their clinical chemistries measured (lipids, glucose, HbA1c, insulin, advanced glycation end products), and underwent an oral glucose challenge (OGC, 50g x 2hrs). Forearm muscle MBF was assessed by contrast-enhanced ultrasound, skin MBF by laser Doppler flowmetry, and brachial artery flow by Doppler ultrasound was determined prior to and 60 min post-OGC. Whole-body DEXA scan was performed before and after RT to assess body composition. Results: After RT, muscle MBF response to the OGC increased, while skin microvascular responses were unchanged. These microvascular adaptations were accompanied by improved glycemic control (fasting blood glucose, HbA1c and glucose area under the curve (AUC) during OGC) and reductions in fasting plasma triglyceride, total cholesterol, advanced glycation end products, and body fat. Changes in skeletal muscle MBF response following RT (increase by 0.1 Al/sec) correlated with reductions in fasting blood glucose ( $\beta = -0.98$ , 95% CI [-1.73, -0.22],  $p = 0.011$ ) and OGC AUC ( $\beta = -85.3$ , 95% CI [-163.8, -6.8],  $p = 0.033$ ). Conclusions/Interpretation: RT improves OGC-stimulated muscle MBF and glycemic control concomitantly, suggesting a MBF role in improved glycemic control from RT.

**SESSION I | LOCATION: CONFERENCE ROOM 2**  
**DEVELOPMENT OF AN INNOVATIVE SMART DIABETIC SHOE INSERT (SDSI) TO MONITOR PROGRESSION OF DIABETES IN REAL TIME**

*Dr. Kamal Sarkar, PhD\*+, Robert Freeman\*, PhD, Mr. Andres Medina\*\*, & Dong-Chul Kim\*\*\*, PhD \*Mechanical Engineering; \*\* Electrical Engineering; \*\*\* Computer Science + Corresponding Author The University of Texas, Rio Grande Valley, Edinburg Campus*  
ABSTRACT: Diabetes is one of the major concern in Rio Grande Valley where 26% of the population (1.1 million) is affected by it compared to 9.3% nationally. Devastating effects of this “silent killer” include vascular disease, lowered immunity, high sugar level, neuropathy Charcot foot, foot ulcer, foot gangrene, among others. Noncompliance in medication, diet, and exercise regime often results in amputation. A biomechanical engineering approach is used to address the issue and develop a commercial product to monitor the progression of the disease in real time. Human foot has 26, small and large, bones to ensure stable balancing in various dynamic environments. Diabetes can dramatically change this delicate balance. Medicare and Medicaid spends tens of millions of dollars every year by supplying passive diabetic shoe inserts that helps alleviate the pains of the patient. However, this approach does not collect any data to monitor the trend of progression of the disease and intervene for impending disasters, if needed. Researchers from the College of Engineering and Computer Science have developed an innovative Smart Diabetic Shoe Insert (SDSI) that can measure, record, and monitor the changes in the plantar pressure distribution in real time. The proposed design integrates flexible pressure sensors, a Bluetooth capable microcontroller, a power source, firmware and a custom smartphone app to seamlessly capture and transmit pressure data to a smart phone. The flexible pressure sensors are placed in key locations and connected to the microcontroller's A/D ports. The microcontroller then transmits the digital pressure data to a smartphone via Bluetooth Low Energy technology. Using a custom smartphone app, the pressure data can then be stored locally or uploaded to the cloud for full medical analysis. The product is noninvasive and suitable for mass manufacturing with a target cost of \$200 per pair when the volume exceeds 10,000.

## Global/Public Health

**SESSION I | LOCATION: CONFERENCE ROOM 3**  
**GENE EXPRESSION PROFILES ASSOCIATED WITH ARBOVIRAL INFECTIONS IN A US-MEXICO BORDER POPULATION: A STUDY DESIGN**

*Alvaro Diaz-Badillo1, Srinivas Mummidi1, Juan Carlos Lopez-Alvarenga1, Beatriz Tapia2, Ravindranath Duggirala1*  
*1South Texas Diabetes and Obesity Institute; 2South Texas Environmental Education and Research, School of Medicine, University of Texas Rio Grande Valley, Edinburg and Harlingen, Texas*  
Infections due to arthropod-borne viruses (arboviruses) impose a substantial cost and health burden to the developing and developed world due to their debilitating nature and long-term health consequences. The U.S.-Mexico border population is highly vulnerable to arboviral diseases such as Dengue, West Nile, Chikungunya, and Zika, but the extent and the effects of such infections in this area are poorly understood. Focused studies in this area are necessary because the border population with its unique genetic background is subjected to specific environmental exposures and socioeconomic challenges, and because gene by environment interactions could modulate their response to infections. We propose to bridge this existing knowledge gap by employing a unique study design, which is described here. This strategy will allow us to dissect the host

immune response to these infections by using genome-wide expression profiles in a susceptible population(s) in Matamoros and Brownsville by performing analyses of the global RNA expression profiles in peripheral blood mononuclear cells and viral RNA levels in plasma and their correlations with disease severity. While the proposed study is restricted to a single pair of trans-border metropolitan agglomerates (Matamoros and Brownsville), our long-term goal is to replicate these studies in paired U.S.-Mexico border towns that will provide powerful insights into the molecular epidemiology of arboviral infections and the differential disease susceptibility in these border region populations. Our transcriptomic analysis could potentially identify novel ethnic-specific biomarkers of the arboviral infections that may aid in disease prognostication and pinpoint novel therapeutic targets and move us towards precision medicine.

**SESSION I | LOCATION: CONFERENCE ROOM 3**  
**TRAUMA AND HEALTH AMONG RECENT REFUGEES AND IMMIGRANT ADULTS AND CHILDREN FROM CENTRAL AMERICA**

*Andy Torres, Paola Quijano Abigail Nuñez-Saenz, Melissa Briones, & Alfonso Mercado*  
Due to the high immigration numbers within the U.S., it is important to study the marginalized population to understand their needs and the lifestyle they are escaping. The purpose of this study was to explore the health and traumatic experiences of recently arrived immigrant families. Participants included 103 families from a humanitarian respite center in McAllen, Texas. They were interviewed and completed health and psychological surveys. A significant correlation between the reported health of the parent and their child was expected. It was also hypothesized that those who reported being sexually assaulted would also report suffering and witnessing physical trauma. The results confirm a medium, positive correlation among the reported overall health of the parent and that of the child. Thus, if the parent reports to have good health, it is likely that the child will, too. Possible explanations for the results are lifestyle factors, genetics, or social economic status that prevents access to health care or medications. The following was found: 14% reported sexual assault, 24% reported physical assault, 50% reported fear of dying/severe injuries, and nearly 43% reported feeling hopeless in those events. An association between those who reported being sexually assaulted and those who reported witnessing a sexual assault exists  $r = .509$ ,  $p < .001$ . A low correlation was also found between those who reported sexual assault and those who reported physical assault  $r = .322$ ,  $p < .001$ .s. Later results could indicate that reported traumas from the participants result from the hostile environment in Latin America, rather than casual instances of crime. Conclusions also add the importance of re-examining the Hispanic Health Paradox. The UTRGV Global Engagement Office was a funding source for this project.

**SESSION I | LOCATION: CONFERENCE ROOM 3**  
**ASSESSMENT RESULTS AND LESSONS-LEARNED FROM THE INTERPROFESSIONAL EDUCATION (IPE), COMMUNITY UNIVERSITY PARTNERSHIP/UTRGV HUBS---YEAR ONE**

*John Ronnau, Senior Associate Dean Office of IPE, Christie Cantu, Senior Program Coordinator; Alexandra Garcia, Program Specialist, Leticia Hayes, Administrative Associate; Eduardo Olivarez, Chief Administrative Officer, HCDHHS; and John Ronnau, Senior Associate Dean Office of IPE*

**ABSTRACT**  
The UTRGV School of Medicine Community-University Partnership/UTRGV Hub initiative is a collaborative endeavor involving the School of Medicine, College of Health Affairs and the other six UTRGV Colleges and multiple community partners. Primary among the community partners is the Hidalgo County Department of Health and Human Services (HCDHHS). With the assistance of the HCDHHS, partnerships have been developed with six communities in three South Texas counties. All of these communities, also known as colonias, are located in rural, medically under-served areas. During year-one, teams of interprofessional students were assigned to each community. The IPE teams were given the assignment of working together collaboratively with each other and community residents to create social service projects to meet the community's needs. This research presentation will provide an over view of the results of the students' assessment of the year-one IPE experience, plus lessons-learned which will further shape the program in the years to come. The learning objective for this presentation are: 1) to provide an overview of the UTRGV IPE initiative; 2) describe the role of community partners; 3) present year-one assessment results; and 4) present lessons-learned based upon assessment results.

**SESSION I | LOCATION: CONFERENCE ROOM 3**  
**SDGS AND GLOBAL HEALTH AND UTRGV LEADERSHIP ROLE**

*Aziza Zemrani, Ph.D., Department of Public Affairs and Security Studies, The University of Texas Rio Grande Valley*  
Building on the Millennium Development Goals, the Sustainable Development Goals (SDGs) agreed on 17 point plan and among them “Ensure healthy lives and promote wellbeing for all at all ages”. The SDGs are a to-do-list for the planet that can be achieved if everyone plays their part (<https://www.womenandchildrenfirst.org.uk/>). Statistical evidence is there rot shade light on some indicators that are alarming, especially for - in low-income countries, one out of every 10 children dies before the age of five, whereas in wealthier nations, this number is only one out of 143. And the lifetime risk of dying in pregnancy and childbirth is one in 22 in Africa, one in 120 in Asia, and one in 3,800 for a fifteen-year-old girl in developed countries. This presentation is raising awareness from a global perspective and how UTRGV, and the School of medicine can make a difference in the world through providing education from a multi-disciplinary perspective.



**SESSION I | LOCATION: CONFERENCE ROOM 3  
SCHOOLS AS THE FOCAL POINT FOR CHILD MENTAL HEALTH PREVENTION IN THE U.S.: A NATIONAL POLICY PERSPECTIVE**

*Guang Zeng, Ph.D. Texas A&M University-Corpus Christi*

This presentation reviews the U.S. federal policies and policy development milestones in child mental health and public education in the last century beginning in the 1900s. By presenting these two tracks of policies in parallel chronologically, this presentation highlights the fragmented nature of U.S. federal efforts in addressing crises in child mental health and public education in contrast to the co-occurring nature of the problems. It is concluded that, to achieve optimal outcomes, federal efforts in improving children's mental health and academic performance should be integrated. From a national policy perspective, the author recommends (a) a broader accountability system that emphasizes both academic performance and social emotional development, and (b) making schools the focal point for child mental health prevention and intervention, and bolstering the function of School-Based Mental Health (SBMH)

## Biomedical/Basic Science Category

**SESSION I | LOCATION: CONFERENCE HALL A&B  
ADRENERGIC MODULATION OF PRO-INFLAMMATORY RESPONSES IN OVARIAN CANCER**

*Claudia B. Colón-Echevarría, MPH1, Tatiana Ortiz, MA1, Lizette Maldonado, BS1, Melanie J. Hidalgo-Vargas, BS1, Pedro Cruz-Rosa2, Alexandra Maldonado2, Guillermo N. Armaiz-Peña, PhD1,3. 1Department of Basic Sciences, Division of Pharmacology, School of Medicine, Ponce Health Sciences University, Ponce PR; 2University of Puerto Rico in Ponce, Ponce PR; 3Division of Cancer Biology, Ponce Research Institute, Ponce PR*

Work from our group has shown that chronic stress accelerates growth of existing tumors by activating the sympathetic nervous system. Specifically, our data suggest that sustained adrenergic signaling can induce tumor growth, secretion of pro-inflammatory cytokines and macrophage infiltration. Moreover, increased macrophage infiltration was associated with decreased survival in ovarian cancer patients. Hence, we investigated role of adrenergic-stimulated macrophages in ovarian cancer biology. To assess functional output resulting from adrenergic stimulation we used cytokine arrays. An orthotopic model of ovarian cancer was used to assess the in vivo effect of adrenergic-induced macrophages on tumor growth. Cytokine array analyses showed that adrenergic stimulation modulated pro-inflammatory cytokine secretion in a SKOV3ip1 (ovarian cancer cells) /J937 (macrophages) co-culture system. Among these, nine significantly upregulated cytokines were identified in both, epinephrine and norepinephrine, treated co-culture systems (Angiogenin, BAFF, ENA-78, GM-CSF, IL-5, Lipocalin-2, MIF, PDGF-AA and Tlr). In addition, daily restraint stress resulted in increased ovarian cancer growth in two orthotopic models of ovarian cancer (SKOV3ip1 and HeyA8), while zoledronic acid (agent with anti-macrophage activity) abrogated this effect. Here, we show that adrenergic-induction of macrophages play a key role in the progression of ovarian cancer. Future studies will be directed towards further investigating the role adrenergic-induced macrophages and cytokines in ovarian cancer progression. This research was supported by the PR-INBRE NIH/NIGMS P20GM103475, NIH/NCI U54CA163071, NIH/NIMHHD G12MD007579, American Cancer Society IRG Grant and the Puerto Rico Science, Technology and Research Trust.

**SESSION I | LOCATION: CONFERENCE HALL A&B  
TOLL-LIKE RECEPTOR-2/6 AND TOLL-LIKE RECEPTOR-9 AGONISTS SUPPRESS VIRAL REPLICATION AND CHRONIC ASTHMA IN MICE**

*David L. Goldblatt, Gabrielle Valverde, Jose R. Flores, Shradha Wali, Ana Maria Jaramillo, Scott E. Evans, Michael J. Tuvim, Burton F. Dickey UT MD Anderson Cancer Center, Houston, TX*

Persistent activation of innate immunity pathways in mice can transform a respiratory viral infection into chronic lung disease – similar to Asthma1. Toll-like receptor-2/6 (TLR2/6) and Toll-like receptor-9 (TLR9) agonists have also been shown to protect mice against an otherwise lethal dose of viral pneumonia2. Currently, there are no therapies which target respiratory viruses most commonly associated with asthma exacerbations, such as Rhinovirus or Coronavirus3. To represent these viral infections in a mouse model, Sendai virus, a parainfluenza virus which replicates in a highly efficient manner in murine hosts, is used as a model for virus-induced asthma. The purpose of this study is to determine whether TLR2/6 and TLR-9 stimulation can protect mice from developing chronic lung disease after an acute viral challenge. METHODS: We treated C57BL6 mice with a combination of 2,3-bis(palmitoyloxy)-2-Propyl-Cys-Ser-Lys-Lys-Lys-Lys-OH (Pam2CSK4) as a acetate salt and oligonucleotide 5' TCG TCG TCG TTC GAA CGA CGT TGA 3' (ODN M362) as a sodium salt on a nuclease-resistant phosphorothioate backbone to stimulate both TLR2/6 and TLR 9, respectively. Pam2CSK4 and ODNm362 were formulated into a final product (Pam2ODN) in a 4µM to 1µM ratio. Pam2ODN treatment was administered from 10 days prior to 3 days after challenge with Sendai virus (SeV). Acute lung viral burden was measured 5 days after challenge using RT-qPCR against the M protein normalized to 18S rRNA. Bronchoalveolar leukocyte lung inflammation was quantified 49 days after challenge. Mucous metaplasia was measured 49 days after challenge using a fluorescent periodic acid Schiff stain and quantified using image analysis. Airway hyperresponsiveness was assessed 49 days after challenge by measuring total lung resistance using forced-oscillation breathing on a rodent respirator (Flexivent, Scireq) and a methacholine dose escalation challenge. Acute viral protection was assessed using qPCR to measure viral titer at 5 days post-infection. RESULTS: Treatment of Pam2ODN 1 day before SeV infection causes a 75% reduction of SeV mRNA levels in the lung at 5 days post infection. There was a time- and dose-dependent alleviation of acute viral burden, chronic inflammation, chronic mucous metaplasia, and airway hyper-

responsiveness. Acute infection was associated with increased epithelial proliferation, which was reduced in treated mice. Chronic inflammation was associated with IL-33 expression in type 2 alveolar pneumocytes, which was reduced in treated mice. CONCLUSIONS: SeV viral infections cause a chronic lung disease similar to asthma in mice. O/P treatment leads to a lower acute viral burden. This lower viral burden can be directly correlated to an alleviation of chronic inflammatory status. Because viral infections, similar to SeV, are a major cause of asthma exacerbations, it is plausible to use aerosolized O/P treatment can be used as therapeutic for asthma.

**SESSION I | LOCATION: CONFERENCE HALL A&B  
NOVEL NANOTECHNOLOGY APPROACH TO TARGET CANCER- SWITCH FROM PROTO-ONCOGENE TO TUMOR SUPPRESSOR.**

*Alexander Kazansky, PhD., Jose Vega, Department of Health and Biomedical Sciences, The University of Texas Rio Grande Valley*

Prostate cancer remains one of the most common and potentially lethal neoplastic manifestations among men. In many cases, malignant transformation can be directly linked to activation of the STAT family of transcription factors. STAT5B, a specific member of the STAT family, is intimately associated with prostate tumor progression. While the full form of STAT5B is thought to promote tumor progression, a naturally occurring truncated isoform acts as a tumor suppressor. We previously demonstrated that truncated STAT5 is generated by insertion of an alternatively spliced exon and results in the introduction of an early termination codon. In this report we demonstrate a new approach aimed at inhibition the expression of full-length STAT5B (a proto-oncogene) while simultaneously enhancing the expression of STAT5ΔB (a tumor suppressor). The presented work combines the actions of steric-blocking splice-switching oligonucleotides (SSOs) and a novel nanotechnology-based approach for targeted delivery of DNA to tumor cells. We were able to block alternative splicing of STATs mRNA applying conjugates of SSO with pH insertion peptide (pHLIP). Our data demonstrates the functional effect of the intron/exon proportional tuning toward anti-cancer activity. A common feature of most STATs is alternative splicing, which leads to generation of a dominant-negative isoform. STAT proteins are involved in wide variety of physiological processes including immune response and tumor progression. Ability to modulate their actions and specifically switch function from tumor activating to tumor suppressing would be highly beneficial in many areas of biomedical research. In conclusion we developed and confirmed a novel method to implement steric-blocking splice-switching oligonucleotides for targeted delivery towards the development of novel therapeutic strategies. Supported by NIH/NIGMS SC3GM087201.

**SESSION I | LOCATION: CONFERENCE HALL A&B  
GENETIC DETERMINANTS OF SERUM CAROTENOID CONCENTRATIONS AND THEIR RELATIONSHIP WITH OBESITY AND RELATED TRAITS IN MEXICAN AMERICAN CHILDREN**

*Srinivas Mummidi1\*, Lavanya Reddivari2\*, Vidya S. Farook1\*, Juan Carlos Lopez-Alvarenga1\*, Rector Arya1, Sobha Puppala3, Sharon P. Fowler4, Roy G. Resendez1, Joanne E. Curran1, Donna M. Lehman4, Christopher P. Jenkinson1, Jane L. Lynch5, Ralph A. DeFronzo4, John Blangero1, Daniel E. Hale6, Ravindranath Duggirala1, Jairam K. P. Vanamala7,8; \*equal contribution 1South Texas Diabetes and Obesity Institute, University of Texas Rio Grande Valley, Brownsville and Edinburg, TX 2Department of Plant Science, Penn State University, University Park, PA 3Department of Genetics, Texas Biomedical Research Institute, San Antonio, TX 4Department of Medicine, University of Texas Health San Antonio, San Antonio, TX 5Department of Pediatrics, University of Texas Health San Antonio, San Antonio, TX 6Hershey Medical Center, Penn State University, University Park, PA 7Department of Food Science, Penn State University, University Park, PA 8Center for Molecular Immunology and Infectious Diseases, Penn State University, University Park, PA*

Background: High serum concentrations of carotenoids are protective against obesity and related traits (ORT) in adults and children. Identifying the genetic determinants of variation in serum carotenoid concentrations is important to combat the growing global obesity epidemic. Objective: We estimated common genetic influences on the concentrations of three different serum carotenoids and ORT in Mexican American children. Design: We obtained ORT phenotypic information from 670 nondiabetic children, aged 6-17 years, who participated in our SAFARI Study. Serum lycopene, β-cryptoxanthin, and lutein/zeaxanthin concentrations were measured in 590 children using an ultraperformance liquid chromatography-photodiode array. We determined heritabilities and examined their genetic relation with nine ORT using family data and variance component analysis, after adjusting for age and sex effects. Results: Carotenoid concentrations were highly heritable [lycopene: h2 =0.98, P=7.3x10-18; β-cryptoxanthin: h2=0.58, P=1x10-7; lutein/zeaxanthin: h2=1.00, P=1.5x10-29]. We found significant (P≤0.05) negative phenotypic correlations between β-cryptoxanthin and ORT: body mass index (-0.22), waist circumference (-0.25), and triglycerides (-0.18) and positive correlations with HDL cholesterol (0.29). Lutein/zeaxanthin concentrations showed significant negative correlations with fasting insulin and HOMA-IR, in addition to the above traits except triglycerides. Lycopene showed significant negative correlation with fasting glucose and positive correlation with HDL-C. When the phenotypic correlations were partitioned into genetic and environmental correlations, there was evidence in favor of significant common genetic influences underlying the observed phenotypic correlations between certain carotenoids and ORT. Conclusions: Our findings suggest that the serum carotenoids are under strong additive genetic influences and may have differential effects on susceptibility to ORT in children.

**SESSION I | LOCATION: CONFERENCE HALL A&B  
CA2+-MEDIATED ACTIVATION OF ESTROGEN RECEPTOR-A BY CALMODULIN**

*Yonghong Zhang1, David B. Sacks2, and James B. Ames3*

*1 Department of Chemistry, University of Texas Rio Grande Valley, Edinburg, Texas 78539; 2 Department of Laboratory Medicine, NIH, Bethesda, Maryland 20892; 3 Department of Chemistry, University of California, Davis, California 95616*

Estrogen receptor  $\alpha$  (ER- $\alpha$ ) is a nuclear hormone receptor that controls selected genes, regulates proliferation and differentiation of target tissues implicated in breast cancer. Gene expression controlled by ER- $\alpha$  is modulated by Ca<sup>2+</sup> via calmodulin (CaM). However, the detailed molecular mechanisms underlying this regulation remain to be elucidated. A clear molecular picture of calcium-dependent ER- $\alpha$  signaling is required to develop better therapeutic modalities. This work takes a multi-disciplinary approach incorporating NMR structural biology for structure determination of ER- $\alpha$ /CaM complex, in parallel with the detailed analysis of ER- $\alpha$  transcriptional activity in human cells transfected with CaM to provide in vivo evidence. The determined structure of Ca<sup>2+</sup>/CaM bound to two molecules of ER- $\alpha$  shows that two lobes of CaM bind to the same site on two separate ER- $\alpha$  molecules to form a 1:2 complex and stabilizes ER- $\alpha$  dimerization. The formation of salt bridge between exposed glutamate residues in CaM and key lysine residues in ER- $\alpha$  is likely to prevent ubiquitination at these sites and inhibits degradation of ER- $\alpha$ . Transfection of cells with full-length CaM slightly increased the ability of estrogen to enhance transcriptional activation by ER- $\alpha$  of endogenous estrogen-responsive genes. By contrast, expression of either N- or C-lobe of CaM abrogated estrogen-stimulated transcription of the estrogen responsive genes and progesterone receptor. Ca<sup>2+</sup>/CaM-induced dimerization of ER- $\alpha$  is required for estrogen-stimulated transcriptional activation by the receptor. In light of the critical role of ER- $\alpha$  in breast carcinoma, binding of CaM with ER- $\alpha$  may represent a novel potential therapy of breast carcinoma.

## NEUROSCIENCE

**SESSION II | LOCATION: CONFERENCE ROOM 2  
BIOCOMPATIBLE MICROCHANNEL SCAFFOLD WITH MICROWIRES FOR RECORDING  
REGENERATIVE PERIPHERAL NERVE NEURAL SPIKES**

*Manisankar Chennamsetti1, Joshua Acosta1, Thant Soe2, Moses Noh, PhD2, Yoonsu Choi, PhD1*

*1Department of Electrical Engineering, The University of Texas Rio Grande Valley, McAllen, TX*

*2Department of Mechanical Engineering and Mechanics, Drexel University, Philadelphia, PA*

While recent advances in robotics appear promising for the recovery of some function through the use of prosthetics, neural control of these devices remains incomplete and unreliable. The limitations of nerve electrode interfaces vary depending on the type of electrode and the response of the implantation tissue, however, signal decay over time has remained an insurmountable challenge despite the multiple electrode technologies available. A new process for the fabrication of a microchannel scaffold with microwires for peripheral nerve applications is presented. This microchannel scaffold implemented between the ends of nerves guide the axons of which regenerate through microchannel in scaffold and fixed microelectrodes. This device is entirely handcrafted using commercially available materials such as microwires, PDMS film, liquid PDMS, dental cement, and epoxy glue. This device was implemented in a Lewis rat sciatic nerve to better analyze the electrical signals of regenerated axons. 64-electrode microchannel scaffolds were developed for both peripheral nerve interfacing and peripheral nerve regeneration. The microwires were used for recording electrode to capture neural signal from the regenerated peripheral nerves. To further differentiate the methodology, the new addition of a ribbon cable will facilitate the transmission of the electrical signals. A total of eight devices have been developed, the nerve regeneration were examined four weeks after device implantation.

**SESSION II | LOCATION: CONFERENCE ROOM 2  
CIRCADIAN RHYTHMS AND AGEING**

*Victoria Ragland, Department of Neuroscience, The University of Texas Rio Grande Valley*

In aging animals, the amplitudes of circadian rhythms are decreased and there are often deficits in the entrainment of the circadian system to light, which can cause internal desynchronization of the circadian clocks throughout the body. Caloric restriction (CR) is one of the few regimens that enhances longevity in mammals, yet the mechanisms underlying this beneficial effect have remained elusive. We examine BMAL1, a master circadian clock gene, to elucidate to contribution of caloric and time restricted feeding on aging. We generated five experimental groups of mice: 1) Ad lib controls: fed ad lib with no temporal restriction; 2) RF-day: ad lib feeding, but confined to 12-hrs during the day; 3) RF-night: ad lib feeding, but confined to 12-hrs during the night; 4) CR-day: 30% reduction in calories fed only during the day; and 5) CR-night: 30% reduction in calories fed only during the night. We collect the livers at 6 and 18 months and perform RNA-seq and ChIP-seq analysis to determine DNA binding sites for BMAL1 to assess targets of circadian regulators. We use the ARSER algorithm, annotate the ChIP peaks to genes using UCSC gene database, and then use RNA-seq readouts for each gene to determine whether they're expressed in a circadian manner. For the ad libitum group, the time of peak BMAL1 binding was found to be significantly different in the young and old mice, and the amplitude of circadian cycling genes was dampened in the older group. We are performing this analysis for the other 4 different feeding conditions to determine whether a specific feeding condition better resembles young mouse profile at the 18 month time point. This elucidates how caloric restriction affects transcriptional architecture during ageing and time importance of time of food intake. This has broad implications for future metabolic health and longevity studies.

**SESSION II | LOCATION: CONFERENCE ROOM 2  
SPICE UP YOUR LIFE WITH K2—AN OVERVIEW OF SYNTHETIC CANNABINOIDS**

*Adrian Sandoval, PharmD, BCPS, BCACP1, Miguel Lopez2, LMSW, LCDC, TRT, CART, Eron Manusov, MD1*

*1 The University of Texas Rio Grande Valley School of Medicine Department of Family and Community Medicine*

*2 John Austin Peña Memorial Clinic*

Marijuana, also known and Cannabis sativa, has been abused for its psychedelic effects for thousands of years. It contains over four hundred chemicals, and tetrahydrocannabinol (THC) is responsible for many of its mind-altering effects. Scientists have studied THC to investigate its medical use, and this research has ultimately led to the creation of synthetic cannabinoids (SCs). Synthetic, or designer, drugs are slightly modified versions of existing drugs created to increase their psychedelic effect and to evade control as illicit drugs. These are then sold "legally" in a variety of settings. The most extensive SC series created are the Professor John W. Huffman (JWH) molecules which are hundreds of times more potent and dangerous than traditional THC. To date, countless of these molecules have been synthesized in illegal laboratories around the world. Known as K2, Spice, Fake Weed, and by many more names, these toxins have invaded our communities. The effects of SCs rarely mimic those of natural marijuana, and currently limited evidence-based guidance exists on the management of SC overdoses and withdrawals. The purpose of our presentation is to provide an overview of SCs including the management of SC abuse in a triply diagnosed pediatric population with a mental illness, medical illness, and appetitive drive disorder at John Austin Peña Clinic, a UTRGV-based clinic. A significant part of the management includes an integrated and interprofessional approach. The funding source for the clinic is through a grant from Methodist Healthcare Ministries and a partnership with the Hidalgo County Health Department.

**SESSION II | LOCATION: CONFERENCE ROOM 2  
GENETIC VARIANTS IN CCSER1 GENE ASSOCIATED WITH ALZHEIMER'S DISEASE**

*Jonathan Abshier1, Chabeli Weary1, Cindy Barrett2, Ke-Sheng Wang2 Chun Xu1*

*1. Department of Health and Biomedical Sciences, College of Health Affairs, University of Texas Rio Grande Valley, Brownsville, TX 2. Department of Biostatistics and Epidemiology, East Tennessee State University, Johnson City, TN*

Alzheimer's disease (AD) makes up 60-80% of dementia cases and is a progressive disease. An estimated 5.4 million people in the United States are affected. The etiology of AD is multi-factorial, including gene-gene interactions and gene-environment interaction based on family and twin studies. Many Genome Wide Association Studies have been conducted and several genes are suggested for AD. Among these genes, CCSER1, coiled-coil serine rich protein 1 on 4q22.1, is our interested. Several studies of variants in 4q showed association with AD and AD with psychotic symptoms. Therefore, we examined if CCSER1 variants have significant association with risk and age at onset (AAO) of AD in the GenADA-case control data (791 cases and 782 controls with 1,588 single-nucleotide polymorphisms (SNPs) within the CCSER1 gene available) and the NIA-LOAD family study (1266 cases and 1279 controls with 3007 SNPs available). Results of the single marker- and haplotype analyses from both GenADA and NIA-LOAD samples demonstrate several AD associated SNPs within the CCSER1 gene. The top AD-associated SNP was rs10031148 (P=0.0021). Moreover, AD-associated SNP, rs1304349, resulted in alteration of gene expression. Another AD-associated SNP, rs11933080, was also located at highly conserved regions of CCSER1 gene among various ortholog species indicating potentially functioning as cis-regulatory modules and functional important. We concluded that we identified CCSER1 variants in AD, for the first time, using two large cohort samples. This study provides insight into the genetic control of AD. The study, in part, was support by UTRGV start\_up\_fund for Dr. Xu

## Genomics

**SESSION II | LOCATION: CONFERENCE ROOM 3  
EVIDENCE FOR COMMON GENETIC LOCI FOR BIRTH WEIGHT AND ADULTHOOD CARDIO-METABOLIC TRAITS IN MEXICAN AMERICANS**

*Rector Arya1\*, Sobha Puppala2\*, Juan Carlos Lopez-Alvarenga1\*, Srinivas Mummidi1, Alvaro Diaz-Badillo1, Sharon P. Fowler3, Roy G. Resendez1, Joanne E. Curran1, Donna M. Lehman3, Christopher P. Jenkinson1, Benjamin S. Bradshaw4; Ralph A. DeFronzo3, John Blangero1, Ravindranath Duggirala1; \*equal contribution1South Texas Diabetes and Obesity Institute, University of Texas Rio Grande Valley, Brownsville and Edinburg, TX 2Department of Genetics, Texas Biomedical Research Institute, San Antonio, TX 3Department of Medicine, University of Texas Health San Antonio, San Antonio, TX 4School of Public Health, University of Texas Health Houston, Houston, TX*

Birth weight (BW) is shown to be associated with adulthood cardio-metabolic traits (CMTs). However, little is known on specific genetic factors underlying the reported associations between BW and CMTs. Therefore, we performed genome-wide bivariate linkage analyses to localize genetic loci that commonly influence variation in BW and CMTs in Mexican Americans (MAs), using data obtained from the San Antonio Family Birth Weight Study (SAFBWS). We found several genetic regions across the genome to contain susceptibility loci with pleiotropic influences on BW and several CMTs. For example, at marker D1S518 region, for trait pairs involving BW and 5 CMTs (body mass index [BMI], waist circumference [WC], total cholesterol [TSC], systolic blood pressure [SBP], and diastolic blood pressure [DBP]), the LOD score (uncorrected for df, LODuc) ranges from 2.8 (BW-TSC) to 4.1 (BW-WC). Likewise, the LOD score (corrected for df, LODc), which is the equivalent 1 df LOD score corresponding to the stated bivariate LODuc score with 3 df, ranges from 2.0 (BW-TSC) to 3.1 (BW-WC). All of the LODc scores near marker D1S518 region are  $\geq 2.0$  suggesting that this locus may be important in influencing variation in BW and CMTs simultaneously, especially the trait pair BW-WC (LODc=3.1). Similarly, the trait pairs BW-SBP and BW-HDL exhibit strong bivariate linkage profiles at marker D6S1031 region (LODuc=4.9 and LODc=3.9) and marker D9S934 region (LODuc=4.5 and LODc=3.5), respectively. We are in the process of screening these novel genetic loci and other potential genetic regions of interest for identifying functional variants using whole genome sequence data.



**SESSION II | LOCATION: CONFERENCE ROOM 3**

**HYBRID-NETWORK: A BAYESIAN APPROACH TO GENE EXPRESSION DATA**

*Demba Fofana, Department of Statistics, The University of Texas Rio Grande Valley*

Analyzing gene expression data rigorously requires taking assumptions into consideration but also relies on using information about network relations that exist among genes. Combining these different elements cannot only improve statistical power, but also provide a better framework through which gene expression can be properly analyzed. We propose a novel statistical model that combines assumptions and gene network information into the analysis. Assumptions are important since every test statistic is valid only when required assumptions hold. We incorporate gene network information into the analysis because neighboring genes share biological functions. This correlation factor is taken into account via similar prior probabilities for neighboring genes. With a series of simulations our approach is compared with other approaches. Our method that combines assumptions and network information into the analysis is shown to be more powerful.

**SESSION II | LOCATION: CONFERENCE ROOM 3**

**A VECTOR SUBSPACE COMPARISON APPROACH TO STUDY THE PERTURBATION OF GENE EXPRESSION NETWORKS IN RESPONSE TO AGING**

*García-Hernández A, Diego VP, Almeida M, Peralta J, Curran J, Howard TE, Williams-Blangero S, Blangero J*

*South Texas Diabetes and Obesity Institute, School of Medicine, The University of Texas Rio Grande Valley*

Abstract: We have developed a method to compare the vector subspaces of gene expression networks (GENs) of arbitrary size and complexity across environmental contrasts of interest. For this study, we compare the vector subspaces for GENs that are known to be important in aging. We proceed by dividing the total sample into two groups, one consisting of individuals below or equal to the 50th percentile for age (Group Y), and the other consisting of all other individuals (Group O). For any GEN, we will have genes over and individuals correspondingly for Groups Y and O. On performing their singular value decompositions, we obtain their resulting matrices of right singular vectors, denoted by  $\mathbf{Y}$  and  $\mathbf{O}$ . Let the column spaces spanned or generated by their respective columns be referred to as gene expression subspaces, denoted respectively by  $\mathbf{Y}$  and  $\mathbf{O}$ . The columns have been interpreted in the literature as gene expression principal component vectors (PCs). Under the null hypothesis that the change in environment—the age environment in this case—has no effect on the GEN, their pair-wise vectors (across  $\mathbf{Y}$  and  $\mathbf{O}$ ) should be equivalent. The problem now becomes how best to make an inference on their statistical equivalence under the null. The projections onto  $\mathbf{Y}$  and  $\mathbf{O}$ , respectively denoted by  $\mathbf{Y}^T \mathbf{Y}$  and  $\mathbf{O}^T \mathbf{O}$ , are correspondingly given by  $\mathbf{Y}^T \mathbf{Y}$  and  $\mathbf{O}^T \mathbf{O}$ , and the projection  $\mathbf{Y}^T \mathbf{O}$  onto the intersection of gene expression subspaces, denoted by  $\mathbf{Y}^T \mathbf{O}$ , is given simply by their product. A measure of the squared-similarity between the subspaces and is given by: where  $\lambda$  is the eigenvalue of the projection matrix, and the corresponding distance between subspaces is given as: The null hypothesis for the equivalence of subspaces is given as, which can be evaluated using a novel permutation test that we developed and successfully applied to gene methylation networks. We will apply this overall approach to the following GENs, each one known to be important in senescence, namely the: 1) nuclear factor kappa B, 2) insulin-like growth factor I, 3) hypothalamic-pituitary-adrenal axis, and 4) immunosenescence GENs.

**SESSION II | LOCATION: CONFERENCE ROOM 3**

**GENOMIC BIOMARKERS STUDY FOR CERVICAL CANCER PREDICTION.**

*Oyervides-Muñoz MA, Berlanga-Garza A, Antonio-Macedo M, Barrera-Saldaña HA, Treviño V,*

*Perez-Maya AA, Valdez-Chapa LD, Gómez-Macías GS, Garza-Rodríguez ML.*

Cervical cancer (CC) is the second most frequent type of cancer in Mexican women, and most of the cases have been associated with human papillomavirus (HPV) infection. Identify new biomarkers associated with this neoplasia progression is necessary to improve the diagnosis and prognosis of CC. We have collected 255 cervical swabs samples at the Colposcopy consultation in the Hospital Universitario “Dr. Jose Eleuterio González” in Monterrey, Nuevo Leon, Mexico. We performed qPCR to detect HPV presence and 141 swab samples were HPV positive. We found 39% of the samples from patients with no apparent lesion were positive for HPV infection. The most common HPV found were 18, 52 and 16, and this differ to other Mexican and worldwide reports. We found multiple infection association with HPVs 16, 18, 51, 52, 59 and 68, and the most common was 16 and 18. There was also a high viral load association with HPV type 16, 18, 31, 35, 39, 45, 52, 56 and 59. The high grade lesion was associated with HPV 16. Six months after, we collected 65 swab samples as a follow up and founded HPV persistence in 17 samples. And the most common persistent HPV types were 59, 56 and 39. And the most common multiple infection was HPV 59 and 39. We founded a higher viral load in low grade lesions than high grade lesions or cervical cancer in situ samples. This has lead us to continue studying these HPV types and their viral loads, so we might predict the evolution of cervical lesions that could progress to a neoplasia.

**SESSION II | LOCATION: CONFERENCE ROOM 3**

**RISK OF BREAST CANCER.**

*Rodríguez Gutiérrez Hazyadeé Frecia, Burguet Torres Alan, Monsivasis Ovalle Daniela, Estefanía, Pérez Maya Antonio Ali,*

*Barrera Saldaña Hugo Alberto, Garza Rodríguez, María de Lourdes*

The low penetrance gene shows a high frequency in the population. Single nucleotide polymorphism (SNP) has been associated with breast cancer (BC). The SNP rs2665802 (GH1) has been associated with colon cancer protection, the rs35765 and rs2162679 (IGF-1) are associated BC protection and the rs2244502 (PRL) with risk to BC. The aim of this work was to evaluate the association of SNP rs2665802 (GH1), rs35765 and rs2162679 (IGF-1) and rs2244502 (PRL) with BC protection or risk in Mexican women. Methodology. The ethics committee of the Hospital Universitario “Dr. José Eleuterio González” in Monterrey, Mexico approved the study. We included 307 BC patients and 328 controls, the average age was 47 years old. The SNP were detected using real time PCR (qPCR) and Taq man probes. Data was analyzed with SPSS, MAXLIK and EPISOD. Results. We found that allele T of GH1 gene was associated with BC protection. The A/T OR was 0.14 (0.08-0.26) and in the homozygous T/T OR was 0.09 (0.05-0.18), with a p value of 0.0001. There was not association with the SNP of IGF and PRL genes. Conclusion. The SNP rs2665802 is a candidate for biomarker of BC protection in Mexican women. SNP allow us to understanding the genetics risk factors of BC.



## INSTRUCTIONS FOR POSTER PRESENTATIONS

**Poster Session I:** Please set-up all posters by 9 a.m. for session I and make sure that poster is removed by 12 noon to accommodate the following poster session participants. All presenters must be by their poster from 10 to 11:30 a.m. for Session I poster judging.

**Poster Session II:** Please set-up all posters by 12 noon and make sure that poster is removed by 3 p.m. All presenters must be by their poster from 1:30 to 3:00 p.m. for poster judging.

# Undergraduate Category Poster Presentations

## SESSION I, POSTER U-1

### GENETIC VARIANTS IN CCSER1 GENE ASSOCIATED WITH ALZHEIMER'S DISEASE

*Jonathan Abshier1, Chabeli Weary1, Cindy Barrett2, Ke-Sheng Wang2 Chun Xu1 / 1. Department of Health and Biomedical Sciences, College of Health Affairs, University of Texas Rio Grande Valley, Brownsville, TX / 2. Department of Biostatistics and Epidemiology, East Tennessee State University, Johnson City, TN*

#### ABSTRACT

Alzheimer's disease (AD) makes up 60-80% of dementia cases and is a progressive disease. An estimated 5.4 million people in the United States are affected. The etiology of AD is multi-factorial, including gene-gene interactions and gene-environment interaction based on family and twin studies. Many Genome Wide Association Studies have been conducted and several genes are suggested for AD. Among these genes, CCSER1, coiled-coil serine rich protein 1 on 4q22.1, is our interested. Several studies of variants in 4q showed association with AD and AD with psychotic symptoms. Therefore, we examined if CCSER1 variants have significant association with risk and age at onset (AAO) of AD in the GenADA-case control data (791 cases and 782 controls with 1,588 single-nucleotide polymorphisms (SNPs) within the CCSER1 gene available) and the NIA-LOAD family study (1266 cases and 1279 controls with 3007 SNPs available). Results of the single marker- and haplotype analyses from both GenADA and NIA-LOAD samples demonstrate several AD associated SNPs within the CCSER1 gene. The top AD-associated SNP was rs10031148 (P=0.0021). Moreover, AD-associated SNP, rs1304349, resulted in alteration of gene expression. Another AD-associated SNP, rs11933080, was also located at highly conserved regions of CCSER1 gene among various ortholog species indicating potentially functioning as cis-regulatory modules and functional important. We concluded that we identified CCSER1 variants in AD, for the first time, using two large cohort samples. This study provides insight into the genetic control of AD. The study, in part, was support by UTRGV start-up-fund for Dr. Xu

## SESSION I, POSTER U-2

### STRUCTURAL STUDY OF TRANSLATION INITIATION FACTOR 1 FROM PATHOGENIC BACTERIUM CLOSTRIDIUM DIFFICILE

*Faith Aguilar, Yonghong Zhang, PhD1 1 The University of Texas Rio Grande Valley, Edinburg, Tx*

#### ABSTRACT

*Clostridium difficile* is a gram positive, spore-forming, anaerobic bacterium whose virulence factors and mechanisms of pathogenesis require further investigation. *Clostridium difficile* infections (CDI) result in the severe and potentially fatal gastrointestinal diseases pseudomembranous colitis and toxic megacolon following extensive broad spectrum antibiotic treatment. *C. difficile* fatalities are a result of the bacteria's growing antibiotic resistance and consequential CDI recurrence. This has led to the unmet need for CDI treatment. Protein synthesis is an essential metabolic process and a validated target for the development of new antibiotics. To begin to understand the first step of protein biosynthesis at the molecular level, the *C. difficile* translation initiation factor 1 (IF1) gene was sub-cloned into pET24b vector. This placed the gene encoding IF1 upstream of a sequence encoding six histidine residues (LEHHHHHH). The recombinant plasmid was able to successfully over-express the IF1 protein in *E. coli*. Isotopically labeled (<sup>15</sup>N and <sup>15</sup>N/<sup>13</sup>C) Cd-IF1 proteins were subsequently prepared for triple resonance nuclear magnetic resonance (NMR) spectroscopy studies in order to determine the 3-dimensional solution structure of Cd-IF1. Backbone resonance assignment of the Cd-IF1 protein was based off the resulting NMR spectra. This research seeks to further elucidate the structure and thus understand the function of IF1 from *C. difficile* in order to contribute to the development of new strategies and antibiotic mechanisms to combat *Clostridium difficile* infection by targeting protein synthesis. Funding is provided by the UTRGV Internal Seed Research Program (ISRP) Award, award number: 240000303.

## SESSION I, POSTER U- 3

### INTIMATE PARTNER VIOLENCE SCREENING AND INTERVENTION: WE STILL HAVE WORK TO DO

*Claudia Akcoban MD, PGY 3, Ernesto Garcia MD, PGY 2, Alberto Rodriguez MD, PGY2, Maria del C Colon-Gonzalez MD, Assistant (Clinical) Professor, McAllen Family Medicine Residency Program, Department of Family & Community Medicine University of Texas Rio Grande Valley School of Medicine*

#### ABSTRACT

Background: The impact of IPV during pregnancy includes a higher incidence of miscarriage, low birth weight, neonatal death, maternal depression and low self-esteem, as well as maternal use of alcohol, cigarettes, and recreational drugs, and somatic disorders. (2) Pregnancy presents a window for health providers to identify IPV and provide appropriate intervention. (1) Objectives: 1. how many pregnant patients at a local labor and delivery unit were screened for IPV 2. use of a standardized screening tool 3. appropriate interventions for positive cases. Method: A retrospective chart review of 118 pregnant patients

who seek care from June 1, 2016, to December 31, 2016, at a local Labor and Delivery Unit were examined to identify if patients were screened by nursing staff for IPV. Nursing staff documentation was inspected to determine if a standardized protocol with the use of a validated tool in Hispanic females was used with each patient. For those patients that screen positive EMR orders were reviewed to determine if the appropriate consultations were placed by the physician. Results: 118 chart reviewed, 16 did not meet inclusion criteria. The pregnant patients were 23% teenagers and 4% advanced maternal age; while 6% reported use of substance during pregnancy. Our study showed that 61% of the patients were screened using a non-validated tool, while 21% were screened with a validated tool and 18% were not screened. Of a total of 82% of the patients that were screened only one tested positive, but no follow up plan was recorded in the EMR chart. Conclusion: There is a need to standardize screening protocols and use validated tools. A team-based intervention that includes physician, nurse and social worker for follow-up of patients that screen positive in the prenatal period, as well as a safety assessment for the newborn, needs to be implemented.

## SESSION I, POSTER U-4

### PERFORMANCE OF STUDENTS OF MEDICINE DURING A RESEARCH PROGRAM AT UNIVERSIDAD MÉXICO AMERICANA DEL NORTE FROM REYNOSA, TAMAULIPAS, MÉXICO

*Rodrigo Alcalá-Durán, MD1; Claudia I. Veloso-De León, MD1; Nazareth Aguirre, MD student1; Manlio F. Lara-Duck, MD student1, Edgar E. Lara-Ramírez, Dr.Sci.2; A. Gutiérrez-Sierra, MD1; Netzahualcoyotl Mayek-Pérez, Dr.Sci.1 / 1 School of Medicine, Universidad México Americana del Norte AC, Reynosa, Tamaulipas, México; 2 Instituto Mexicano del Seguro Social, Zacatecas, México.*

#### ABSTRACT

The aim of this study was to evaluate the willingness of Mexican and foreign medical students to carry out research work outside or within México, in relation to their interest in research, and to analyze the factors that influence positive and negatively in that perception. A cross-sectional study was conducted after applying validated surveys to 266 students (124 males, 142 females; 18 to 27 years-old) of Medicine of the School of Medicine of Universidad México Americana del Norte AC from Reynosa Tamaulipas; and representing the global student population of all four degrees of the career. The first section of survey assessed general, sociocultural and sociodemographic information and according to 'CLOZE test' to identify the main characteristics and abilities for reading comprehension of students. The second section included questions to evaluate the regular student and the researcher-student: experience in research, interest and knowledge in the field, reasons why students do not investigate, perspective on become a specialist in the future, among others. The most explicative variables were those included into the second section were research interest were analyzed. In general, students of Medicine not have perspectives to develop a researcher career due they prefer to become in a medical specialist (Obstetrics, Pediatrics, Oncology, etc.) instead to develop a medical scientific career (graduate studies).

## SESSION I, POSTER U-5

### BIOCERAMIC REINFORCED COMPOSITES FOR TOTAL JOINT REPLACEMENT

*Mario Alonso and Rogelio Benitez, Rogelio Benitez Jr, Ph.D., Department of Mechanical Engineering, The University of Texas Rio Grande Valley*

#### ABSTRACT

Joint prostheses utilized in total hip arthroplasty (THA) surgical procedures can have a useful lifetime of 10 to 15 years. Although the joint prostheses itself does not fail, the body's inflammatory response to the polymeric wear debris generated by the friction between the acetabular ultra high molecular weight polyethylene (UHMWPE) polymer cup and the metallic head, restrict the useful life of the prostheses and lead to eventual revision surgery. Recently, silicon nitride (Si3N4) ceramic has seen increased use as bioceramic due to its biocompatible, antibacterial and osteoinductive properties. The addition of wear-resistant silicon nitride to UHMWPE can result in a composite with superb wear resistance that could potentially extend the lifetime of joint prostheses by suppressing the formation of polymeric wear debris. This poster presents the ongoing efforts to synthesize micro & nano-reinforced Si3N4-UHMWPE composites at UTRGV as well as preliminary characterization of the composite including surface roughness and microhardness measurements. Support for this study comes from new faculty start-up funds

## SESSION I, POSTER U-6

### SYNTHESIS AND OPTICAL/SCINTILLATING PROPERTIES OF TRANSPARENT CERAMICS

*Raiven Balderas and Yuanbing Mao, Department of Chemistry, The University of Texas Rio Grande Valley, Edinburg, TX 78539*

#### ABSTRACT

Doctors in hospitals perform crucial tests on patients using equipment such as C-arm for fluoroscopy, CT scans, X-ray machines, radiation therapy, etc. One major component of these devices is a scintillation material. In photometric analysis, accurate resolution of incident wavelengths is vital to the integrity of the process and results. However, especially at high energy where photons tend to have high penetration values, the sensitivity and resolving power is severely limited. In order to detect at these high-energy frequencies, detectors utilize scintillator materials to absorb high energy photons and emit a larger number of lower energy photons to which the detector is more sensitive. Apart from large and inflexible single crystals which are notoriously finicky and expensive to produce with limited resolution, new-generation scintillators can be made of nanocomposites and ceramics. However, traditional methods for composite synthesis yield large aggregates and inhomogeneities, while retaining a high polymer fraction, rendering them unsuitable for device manufacture. Solving this problem is an active area of research. A promising method for this includes the creation of transparent ceramics from nanoparticles. In this study, we are synthesizing scintillating nanocrystals, which will be formed into free standing transparent ceramic pellets by sintering after cold press for use as a scintillator. The lanthanum zirconate nanoparticles are synthesized via a facile molten salt method, then pressed into a pellet, and finally undergo sintering to achieve transparency. The optical and scintillating properties of these nanoparticles and ceramics will be tested and proven to be beneficial in the medical field as it can be used in hospitals where x-rays and other radiation-emitting equipment is used.



**SESSION I, POSTER U-7  
HYPERTENSION**

*Cavazos, Ruben, Wang Lin, Ph.D., Department of Health and Human Performance, The University of Texas Rio Grande Valley.*

**ABSTRACT**

Our research project will be about hypertension in the Rio Grande Valley. There has been a rise in obesity in this generation due to local food chains, technology, change in curriculum, etc. Throughout our research we will discuss common factors that can arise and will cause hypertension. We will also discuss ways to prevent hypertension as well as exercises, nutrition and other helpful tips to lower your blood pressure. Hypertension is a condition in which the force of the blood against the artery walls is too high, the normal blood pressure reading should be 120/80 mmHg, while pre-hypertension is a blood pressure reading between 120/80 mmHg and 139/89 mmHg. Hypertension is a blood pressure reading greater than 140/90 mmHg, if your reading is greater than 140/90 mmHg seek medical attention immediately. High blood pressure often has no symptoms but can arise due to poor nutritional habits. We will be discussing proper nutrition such as limiting sodium intake, alcohol consumption and high amounts of carbohydrates. One of the most common diets used for people who have hypertension is the DASH diet. It stands for dietary approaches to stop hypertension. There are several exercises that could be used to help prevent or help lower high blood pressure. Walking thirty minutes a day, water aerobics, and weight lifting are a few exercise that can help people affected. However, stress is another factor why some individuals develop temporary hypertension. When a person is under a great amount stress it could lead to an elevated blood pressure so it is important that you take your care of your body by staying relaxed, dieting, and exercising. Have you ever asked yourself, is hypertension hereditary? What can you do to prevent hypertension? If you have hypertension is there ways it can be reversible? These are some questions someone may want to know about if loved ones may have it or even possibly themselves.

**SESSION I, POSTER U-8  
THE ACUTE EFFECTS OF A DYNAMIC WHOLE BODY VIBRATION WARM-UP COMBINED WITH BLOOD FLOW RESTRICTION ON MUSCLE PEAK TORQUE, VERTICAL JUMP POWER, HEART RATE (HR), AND BLOOD PRESSURE (BP)**

*Maria F. De la Rosa, Juanita Deese, Briana Hoysick, Alondra Chapa and Murat Karabulut, PhD., CSCS, Department of Biomedical Sciences, The University of Texas Rio Grande Valley, Brownsville, TX.*

**ABSTRACT**

Warm-ups are crucial for minimizing risks, such as injuries, and increasing performance. Performing warm-ups on a Whole Body Vibration (WBV) platform have shown to improve performance and strength by recruiting reflex triggered contractions. The purpose of this study was to observe the effects of WBV with blood flow restriction (BFR) on muscle peak torque (strength) and vertical jump power. Eight females and eight males performed four different warm-up sessions. The first session (control) used a cycle ergometer and the following sessions were randomized: one using dynamic squats, another using dynamic squats with WBV, and another using dynamic squats with WBV and BFR. HR, systolic blood pressure (SBP), and diastolic blood pressure (DBP) were observed and recorded before and after each warm-up. No condition main effects of Vertical Jump or Muscle Peak Torque were observed. Significant main effects for condition and time ( $p < .01$ ) for HR before and after exercise were observed. A condition main effect ( $p = .04$ ), time main effect ( $p < .01$ ), and condition\*time interaction ( $p < .01$ ) were observed for SBP. In addition, a significant time main effect ( $p = .02$ ) was seen for DBP. Dynamic WBV with BFR cuffs did not cause significant increases in vertical jump height or peak muscle torque. The intensity and volume of the warm-up may have not been enough for any of the conditions to cause an increase in performance. Future studies using different dynamic squat angles, squat volumes, and pressure of BFR may show differences in Vertical Jump Height or Peak Muscle Torque.

**SESSION I, POSTER U-9  
SURFACE PREPARATION AND CHARACTERIZATION OF SPECIMENS FROM BIOCOMPATIBLE ALLOYS FOR WEAR TESTING**

*Jose Del Rio1, Edson Espinoza1, Marlon Martinez1, Josiah Villareal1, Javier Ortega PhD1 / 1 Mechanical Engineering Department, The University of Texas Rio Grande Valley*

**ABSTRACT**

The implantation of joints prosthesis into the human body allows it to re-establish biological and mechanical functions and therefore to increase the quality of life. Metal-on-polyethylene (MPE) bearings have been successfully used in total hip arthroplasty (THA) for over 40 years. The superior surface finish (mirror like) of metallic Cobalt-Chromium (CoCr) implants mated with polyethylene bearings is believed to be one of the most important factors in the longevity of metal-on-polyethylene bearings (MPE). It can be found in the literature that the mean average roughness (Ra) of metallic endoprostheses surfaces ranges from 0.005 to 0.025 microns. The aim of this work was to prepare and characterize the surface of samples of two of the most commonly used biocompatible alloys in joint bearings, Co-Cr and Titanium alloys, in order be considered as bearing surfaces for wear testing. To achieve this aim, flat discs with 0.250 inches in thickness were cut form bars of CoCr (ASTM F-1537-11) and Titanium Ti6Al4V ELI (ASTM F136-13) alloys with 1.125 inches in diameter using abrasive blades of alumina (Al<sub>2</sub>O<sub>3</sub>) and silicon carbide (SiC). To prepare the surfaces, discs were mechanically polished following the super-finishing process using SiC grinding paper and finished by means of diamond and alumina suspensions. After surface preparation, the mean average roughness (Ra) was determined using the stylus method and a 3D profiler. It was determined that the mean roughness decreased from 0.300 microns after cutting to 0.005 microns after the super-finishing process giving the mirror-like surface required in bearing surfaces for wear testing.

**SESSION I, POSTER U-10  
IDENTIFICATION OF COMPOUNDS THAT INHIBIT THE FUNCTION OF GLUTAMINYLTRNA SYNTHETASE FROM PSEUDOMONAS AERUGINOSA**

*Yaritza Escamilla1, Casey Hughes1, Yanmei Hu1, James M. Bullard2, PhD, The Chemistry Department, The University of Texas Rio Grande Valley, Edinburg, TX USA*

**ABSTRACT**

Introduction: Pseudomonas aeruginosa is a major cause of nosocomial infections and the leading cause of mortality in patients with cystic fibrosis. Previously, GlnRS from P. aeruginosa was over expressed and enzymatically characterized for development as a screening platform for discovery of chemical compounds that have the potential for development as antibacterials. Methods: Scintillation proximity assay (SPA) technology was adapted to the aminoacylation assay and used to screen for inhibitors of activity of P. aeruginosa GlnRS in a medium throughput format. Results: Using this assay, natural product (800) and synthetic (890) compound libraries were screened to detect compounds with the ability to inhibit function of the enzyme. Three compounds (BM02E04, BM04B05, BM04H03) were identified and confirmed to inhibit greater than 50% of enzymatic activity. Each hit compound was from the natural product library and was structurally diverse. These compounds inhibited the activity of GlnRS with IC50 values ranging between 1.7 and 40  $\mu$ M. MICs for compounds with promising IC50 values were determined against a panel of bacteria including; E. coli, E.coli tolC mutant, E. faecalis, H. influenzae, P. aeruginosa, P. aeruginosa PAO200 (efflux pump mutant), P. aeruginosa hypersensitive strain, S. aureus, and S. pneumonia. There was no activity against the wildtype strains of Gram(-) bacteria, but moderate activity was observed against the efflux strain of E. coli indicating the compound may not have access to the molecular target. Moderate MIC was observed for some compounds against Gram(+) bacteria. Conclusion: GlnRS from P. aeruginosa was developed into a screening platform and used to identify compounds that have the potential for development as antibacterial agents against drug resistant pathogenic organisms.

**SESSION I, POSTER U-11  
MICROWAVE DIELECTRIC SPECTROSCOPIC MEASUREMENTS USING A TRANSMISSION/REFLECTION LINE METHOD: BENCHMARK STUDY ON AQUEOUS ETHANOL SOLUTION**

*Pedro Ramos III1, Alondra Escobar2, Michael J. Carrillo3, Yong Zhou1, Wei Lin3 Dept. of Electrical Engineering, University of Texas Rio Grande Valley, Brownsville, TX, United States.*

*1. College of Engineering and Computer Science, University of Texas Rio Grande Valley, Brownsville TX, United States Dept. of Chemistry, University of Texas Rio Grande Valley, Brownsville, TX, United States.*

It is well known that the intermolecular hydrogen bonding interactions of ethanol and water play a very important role in the properties of the mixture. We report the dielectric spectroscopic measurements of the aqueous ethanol solution as a benchmark study using a transmission/reflection line method. The complex permittivity of ethanol/water mixture was measured as a function of frequency between 10 MHz and 18 GHz at eleven volume fractions of ethanol ( $0 \leq V_e \leq 1$ ). Temperature dependency test was performed on several samples. The Debye model and the Cole-Davidson model were applied as assessment of the data from these measurements. The dependency of the dielectric properties on different volume fractions was evaluated. The results were compared to the previous works on ethanol-water system. The good agreement indicates this setup is promising as a reliable way to obtain the dielectric parameters for many biomedical applications. This research was funded by the University of Texas Rio Grande Valley ISRP internal research grant.

**SESSION I, POSTER U-12  
HIGH RESOLUTION OPTICAL IMAGING OF HUMAN LEUKOCYTES IN AQUEOUS BUFFER**

*Alondra Escobar1, Michael Izaguirre2, Juan Guevara2, Natalia Guevara2 \* The Biophysics Research Laboratory 1Engineering and 2Physics Departments University of Texas Rio Grande Valley \*Biophysics Research Laboratory Director*

**ABSTRACT**

Blood cell signaling involves a complex cascade of intermolecular events initiated by the introduction of antigenic material which elicits a response from leukocytes. These cells are key immune suppressor cells that regulate immunity in diverse tissues. Current methods to characterize blood cells include extensive dehydrating and staining procedures that alter the morphology and structure of the cell. Therefore, a live cell morphology representation in aqueous media is needed to better understand the cells' role in the immune response and obtain a more accurate determination of their physical properties, i.e. size and surface features. This project focuses on characterization of human blood cells under conditions closer to their physiologic environment to develop a cell atlas. Blood samples were donated by first author who shows no clinical symptoms of disease. Approximately, 10  $\mu$ L of blood obtained by finger puncture were placed into 1mL of Phosphate-Buffered Saline (PBS), and then centrifuged to remove red blood cells. Leukocytes, platelets and plasma-proteins are recovered in the supernatant and placed in an agarose-buffer hydrogel matrix that serves as a physiologically compatible scaffold for cell suspension. After, samples are extracted and placed in a capillary tube that allows cell visualization at different angles by rotation. A submicron resolution optical microscope system developed at the Biophysics Research Laboratory was then used to image live leukocytes. This method has allowed us to classify potential identities for different leukocytes through high resolution multiple facing images taken every 90 degrees in a cell. Data obtained is used to create an algorithm representing the cells' surface preserving their biological and structural properties.

**SESSION I, POSTER U-13**  
**STUDY OF DIELECTRIC PROPERTIES OF GLUCOSE SOLUTIONS FOR NON-INVASIVE BIOMEDICAL SENSING APPLICATIONS**

*Pedro Ramos III1, Alondra Escobar2, Michael J. Carrillo3, Yong Zhou1, Wei Lin3* 1. Dept. of Electrical Engineering, 2 College of Engineering, 3 Dept. of Chemistry

**ABSTRACT**

Diabetes is one of the major health challenges of the 21st century. According to the International Diabetes Federation, it is estimated that the number of adults living with this disease reaches 366 million, representing 8.3% of the global adult population. In order to manage their condition, patients constantly measure their glucose levels. Methods currently employed involve invasive techniques, requiring direct contact with a sample of blood via puncture of the skin. The aim of this study is to understand the behavior of glucose when exposed to high frequency signals to design a non-invasive blood glucose monitoring device for diabetic patients. A frequency domain analysis was used to perform a comparative study of microwave complex dielectric permittivity. Different glucose concentrations in aqueous solutions were characterized based on their dielectric properties using a transmission-reflection line method. This process involved the use of a Microwave Network Analyzer to determine S-parameters of signals with frequencies ranging from 10 MHz to 18 GHz. Temperature dependence analysis was carried out from 30°C to 60°C, focusing on 30°C - 40°C due to the relevance to the human body. The dielectric behavior observed in glucose solutions increases conductivity when interacting with fixed concentration of sodium chloride ions in water. Analysis made in the spectra allows us to see noticeable frequency shifts due to changes in concentration as well as shifts due to temperature dependency. The dielectric properties were analyzed using the modified Debye model. The resulting parameters compare well with the values obtained from other techniques demonstrating the potentialities in the development of a glucose monitoring device. This research was funded by the University of Texas Rio Grande Valley ISRP internal research grant.

**SESSION I, POSTER U-14**  
**CHARACTERIZATION OF TYROSINE HYDROXYLASE IN THE VENTRAL MESENCEPHALON OF THE GRAY SHORT-TAILED OPOSSUM DURING SPECIFIC STAGES OF EMBRYONIC DEVELOPMENT**

*Hector Filizola, Gabriel A. de Erasquin, Ph.D., The University of Texas Rio Grande Valley, Department of Biomedical Sciences*

**ABSTRACT**

Determining when most dopaminergic neural development occurs is essential to effectively study the molecular basis of dopaminergic system dysfunction that may arise in early embryonic stages. Such dysfunction may lead to psychiatric disorders such as schizophrenia. The animal model that is used in this study is the *Monodelphis domestica*, commonly known as the gray short-tailed opossum. This species possesses many characteristics that make it well-suited for the laboratory environment and for biomedical research in understanding the physiological and genetic mechanisms in mammals, especially during neural development. In fact, the offspring are born at such an early stage of development that resembles a mouse at 12.5 days of gestation and a human embryo of 6-weeks. We have established protocols to both obtain a primary culture of dopaminergic neurons successfully, and to visualize tyrosine hydroxylase (TH) with immunocytochemistry. We used TH as a dopaminergic marker since it is an enzyme required for the synthesis of catecholamine neurotransmitters, including dopamine. Having established these protocols is beneficial because dopaminergic primary cell cultures provide a superb model for studying the physiology of neurons in vitro. The experiments for this project will aim at showing the differences in TH expression among 9, 10, and 11-day old neurons. Prior literature has shown that rats at the equivalent embryonic stages have the most dopaminergic system development, and we seek to elucidate whether this also applies to the *Monodelphis domestica*. Discerning whether this is the time of most dopaminergic neural development can open the door for further research investigating the relationship between dopaminergic system development and associated disorders including schizophrenia, Parkinson's disease, and major depressive disorder.

**SESSION I, POSTER U-15**  
**OPTIMIZATION OF THE FABRICATION METHOD OF MINOCYCLINE LOADED PLGA MICROPARTICLES FOR GLIOBLASTOMAS**

*Franco, Jesús Roberto, Chew, Sue Ann, Ph.D., Department of Health and Biomedical Sciences, The University of Texas Rio Grande Valley*

**ABSTRACT**

Glioblastoma is the most common primary brain tumor in adults, with approximately 10,000 patients in the US receiving this diagnosis annually with an average life expectancy of up to 21 months from diagnosis. The goal of this study is to optimize the loading method of our prefabricated minocycline loaded microparticles which will be used in a dual delivery system to locally deliver minocycline (an anti-angiogenic drug) with a chemotherapy agent for the treatment of glioblastoma. In this work, two modifications to our original loading protocol were tested: 1) amount of PBS used to dissolve drug and 2) lyophilization after drug loading. PLGA microparticles were fabricated by emulsion-solvent evaporation method and the drug loading and release kinetics were determined over a 14 day period by measuring the absorbance of minocycline at 350 nm with a spectrophotometer. We found that a second lyophilization step after drug loading and increasing PBS used for drug loading did not make a significant difference in the drug loading or release kinetics. Lyophilization was a lengthy process that presented room for errors. Since it did not result in any improvement, we concluded that we will not include this step in our loading protocol in the future. We will use our original protocol of using 1.9 µL of PBS for loading without the lyophilization step. Future work includes investigating the effects of different fabrication parameters of our prefabricated microparticles including the amount of ddH<sub>2</sub>O, PVA concentration, and PLGA/DCM weight ratio on drug release kinetics to prolong the release of minocycline from these particles.

**SESSION I, POSTER U-16**  
**STREPTOZOCIN-INDUCED TYPE-1 DIABETES MELLITUS RESULTS IN DECREASED DENSITY OF CGRP SENSORY AND TH SYMPATHETIC NERVE FIBERS THAT ARE POSITIVELY CORRELATED WITH BONE LOSS AT THE MOUSE FEMORAL NECK**

*Karla Estefanía Galindo Ordoñez, Autonomous University of Tamaulipas*

**ABSTRACT**

Type-1 diabetes mellitus (T1DM) results in loss of innervation in some tissues including epidermis and retina; however, it is unknown its effect on bone innervation. Likewise, T1DM results in pathological bone loss and increased risk of fracture. Thus, we quantified the density of calcitonin gen-related peptide (CGRP+) sensory and tyrosine hydroxylase (TH+) sympathetic nerve fibers and determined the association between the innervation density and microarchitecture of trabecular bone at the mouse femoral neck. Ten weeks-old female mice received 5 daily administrations of streptozocin (i.p. 50 mg/kg) or citrate (control group). Twenty weeks later, femurs were analyzed by microCT and processed for immunohistochemistry. Confocal microscopy analysis revealed that mice with T1DM had a significant loss of both CGRP+ and TH+ nerve fibers in the bone marrow at the femoral neck. Likewise, microCT analysis revealed a significant decrease in the trabecular bone mineral density (tBMD), bone volume/total volume ratio (BV/TB), trabecular thickness (Tb.Th), trabecular number (Tb.N) and trabecular separation (Tb.Sp) in mice with T1DM as compared to control mice. Analysis of correlation revealed a positive and significant association between density of CGRP+ or TH+ nerve fibers with tBMD, BV/TV, Tb.Th and Tb.Sp, but not with trabecular number (there was a positive association only for CGRP+) and degree of anisotropy. This study suggests an interaction between sensory and sympathetic nervous system and T1DM-induced bone loss. Identification of the factors involved in the loss of CGRP+ sensory and TH+ sympathetic fibers and how they regulate bone loss may result in new avenues to treat T1DM-related osteoporosis. This work was supported by the Mexican National Council of Science and Technology [CB-2014 240829, INFR-2016 270549]; Autonomous University of Tamaulipas [PFI 2016-34].

**SESSION I, POSTER U-17**  
**SYNTHESIS OF 8-HYDROXYQUINOLINE DERIVATIVES AS ANTI-GLIOBLASTOMA AGENT**

*Kiana Garcia, Matthew Estrellado, Shizue Mito Ph.D. Department of Chemistry, University of Texas Rio Grande Valley, Edinburg, TX*

**ABSTRACT**

8-Hydroxyquinoline and its derivatives have been synthesized and demonstrated various biological activities such as antimicrobial, anti-Alzheimer, and antitumor activities, in particular, glioblastoma cells. Our research group found a new method for the synthesis of 6-acylated 5,8-dihydroxyquinoline, which structure has an extra OH group and an acyl substituent in addition to 8-hydroxyquinoline. These additional substituents are to be easily converted to other functional groups. 8-Hydroxyquinoline has also enabled Mannich reactions, therefore, forming Mannich Bases, which have previously shown bioactivity. Our objective is to prepare various 8-hydroxyquinoline derivatives using our synthetic method to test bioactivity against human glioblastoma cells. To synthesize, first, a reaction of 8-hydroxyquinoline with [bis(trifluoroacetoxy)iodo]benzene in deionized H<sub>2</sub>O and acetonitrile formed the starting material, quinoline-5,8-dione. Following the process, quinoline-5,8-dione is added with benzaldehyde in benzene. Finally, the reaction was performed under 325nm UV light until quinoline-5,8-dione was consumed. The reaction was monitored by thin layer chromatography. The obtained crude mixture was purified by column chromatography. Our previous research was conducted using sunlight to synthesize 8-hydroxyquinoline derivatives that can be used to modify Alq<sub>3</sub>, a light emitting compound. The use of sunlight took days for the reaction to complete. Instead of using sunlight, 325nm UV light is now being used. By using UV light, the reaction time was shortened from days to hours. Our previous results by sunlight gave moderate to good yields. Future work will include testing modified 8-hydroxyquinoline derivatives against the cell line growth of glioblastoma cells, in collaboration with Dr. Benxu Cheng, Department of Biomedical Sciences, School of Medicine at UTRGV.

**SESSION I, POSTER U-18**  
**ALTERNATIVE CURES FOR ADHD USING PHYSICAL ACTIVITY VS PHARMACOTHERAPY**

*A.J. Gorena, Joel Garza, Romeo De Luna, Ramon Enriquez, Wang Lin, Ph.D., Department of Health and Human Performance, The University of Texas Rio Grande Valley.*

**ABSTRACT**

ADHD, Attention Deficit Hyperactivity Disorder, has three different subtypes: inattentive, hyperactive-impulsive and exhibit the hyperactivity component. Many children who are diagnosed with ADHD sometimes find themselves being labeled as lazy or unmotivated, but in all reality, they are actually dealing with a neurodevelopmental disorder. The most commonly used treatment method for ADHD is prescription medication. These prescription medications can be found in the form of either transdermal (pills) or non-transdermal (patches). Some of the medications being prescribed are Lisdexaphetamine, Adderall, Concerta, Ritalin LA, Focalin and Daytrana. Studies are still to this day being conducted in order to find clear-cut evidence of the short-term and long-term effects of these medications. Although these medications may produce some positive results, in many cases they only last for a short period of time and must be taken in multiple doses throughout the day. Some of the side effects of taking these medications include stunted growth, substance abuse and performance loss. Other possible side effects these medications may cause are loss of appetite, sleep deprivation and mood swings. Side effects vary by age, but it appears pre-school age children deal with these effects the most. With all that being said, is there another treatment out there for parents to find other than medication? Recent studies have shown that through the use of exercise and physical activity, the dopamine levels within a patient's brain actually increase. Dopamine is the same chemical not being adequately produced in children with ADHD. Also, physical activity can reduce stress levels, alleviate anxiety/depressive symptoms and improve cognitive functions. Physical activity can therefore become a more positive and healthier alternative for those parents who are searching for better ways to improve their child's well-being as opposed to having them constantly ingest several medications which may eventually hurt them in the long run.



**SESSION I, POSTER U-19**  
**STRETCHING ADVANTAGES FOR ELDERLY PEOPLE**

*Ramsey Garza, Elvia Garza, Heather Padilla, Amber Glapa, Wang Lin, Ph.D., Department of Health and Human Performance, The University of Texas Rio Grande Valley*

**ABSTRACT**

Stretching before exercise is a good general practice. However, the stretches that make the largest difference in your program will be those done after exercise. When the muscles are warmed up, like after exercise, they will stretch with less resistance and retain their new length much more efficiently than after a light warm-up or when cold. Stretching after exercise helps to avoid muscle soreness and directs the muscle repair systems in the body to strengthen the connective tissue of the muscles stretched. The most important time to stretch during training is after the session and in between sets. When relating stretching to age we know that as a person gets older they tend to lose the range of motion in tendons, ligaments, and muscles. Primary goal of stretching is to extend the range of motion of any given joint. In the elderly, it is evident their age population experiences more postural deficiencies as Muscles shorten over time and can contribute to poor posture, which can also be caused by consistently training over a limited range of motion. According to the American Council on Exercise (ACE), "flexibility training is a vital component of a well-rounded fitness program." The use of stretching liberates greater (ROM) in joints and oxygen intake to the muscles. According to human kinetics the "improved of flexibility may enhance performance in aerobic training and muscular conditioning." Along with stretching comes great benefits such as reduced stress in the exercise muscles and the release of tension developed after a workout, assists on posture minimizing stress and maximizing the strength of all-joints. The viscosity of muscles could be improved with daily stretching either in the middle of the day or before going to bed. The purpose of this study is to enhance, reduce injury, and inform the subjects of proper stretching techniques in the importance of flexibility.

**SESSION I, POSTER U-20**  
**DERMO PRESENCE IN LOWER LAGUNA MADRE OYSTERS**

*Daniel Gonzalez, David Ammons Technique, Kai Ammons Collecting, Dr. Joanne Rampersad-Ammons, Mentor, Chemistry Department, University of Texas Rio Grande Valley, Edinburg, Texas*

**ABSTRACT**

Oysters and clams play an important role in the shellfish industry in Texas and the industry is worth 148 billion dollars worldwide. The oysters (*Crassostrea virginica*) and clams (*Donax texasianus*, and *Chione elevata*) of the Lower Laguna Madre are known to be filter feeders. Their quality is important to both the ecosystem and also as possible candidate organisms for mariculture thus it is important to understand the diseases that could affect these bivalves. Oysters are often plagued by a disease known as Dermo, caused by *Perkinsus marinus* which is known to be in the Lower Laguna Madre and which we have found. Dermo is prevalent in warm waters. Natural infections are often caused by parasites released from dead disintegrating oysters or by scavenger feeding on dead oysters. When oysters become infected, they can die anywhere up to three years after initial exposure and infection. We recently started looking at clams and discovered that Dermo affects them as well. Dermo diagnosis was done by culturing anal-rectal tissue in Rays Fluid Thioglycollate Media (RFTM). Oyster and clam samples, from the Lower Laguna Madre (LLM) were taken back to our laboratory and are cultured in RFTM and stained for Dermo detection. Our hypothesis consisted of two main points; 1. Dermo is in the LLM, 2. Dermo may affect other bivalves in the LLM. We will report on our findings to date and suggest future research direction based on these findings. I would like to thank the Howard Hughes Medical Institute for undergraduate research for their funding at UTRGV. UTRGV Science Education Grant Program #52007568 funded by the Howard Hughes Medical Institute. The Personal Identification is Dr. Joanne Rampersad-Ammons.

**SESSION I, POSTER U-21**  
**TARGETING VIRULENCE IN CANDIDA ALBICANS: IN VITRO CHARACTERIZATION OF A SMALL MOLECULE ANALOGUE**

*Victoria T. Gonzalez<sup>1</sup>, Jesus A. Romo<sup>2</sup>, Matthew Valdez<sup>3</sup>, Keith Gonzalez<sup>3</sup>, Stanton McHardy<sup>3</sup>, Stephen P. Saville<sup>2</sup>, and Jose L. Lopez-Ribot<sup>2</sup> / <sup>1</sup>The University of Texas at Rio Grande Valley, Edinburg, TX, U.S.A., <sup>2</sup>Department of Biology and The South Texas Center for Emerging Infectious Diseases, <sup>3</sup>Center for Innovative Drug Discovery, The University of Texas at San Antonio, San Antonio, TX, U.S.A.*

**ABSTRACT**

The opportunistic pathogenic fungus, *Candida albicans* is a commensal of the human body with the ability to develop into the life threatening infection candidiasis. Candidiasis carries mortality rates as high as 60% and healthcare costs between \$2-4 billion annually in the United States. Individuals most at risk include those undergoing surgery and transplants as well as patients with prosthetics and those afflicted by HIV/AIDS. *C. albicans* is able to undergo morphological changes from yeast to filamentous forms. This is pivotal for tissue invasion, as well as biofilm formation, which exhibit increased resistance to antifungal drugs when compared to their planktonic counterpart. Biofilms are highly resistant to the immune response of the host and are able to seed new sites of infection. Filamentation and biofilm formation represent vital targets that have yet to be exploited. Our group recently developed a 96 well plate-based method, which allows the formation *C. albicans* biofilms as well as the ability to test their susceptibility to antifungal treatment. Using this assay our group previously screened 30,000 small molecules from the commercially available DIVERSet library (Chembridge) for compounds with biofilm inhibition activity. From this screen, compound 9029936 was identified as a candidate with potent biofilm inhibition capabilities. In collaboration with the Center for Innovative Drug Discovery, molecular analogues were designed. Analogue 67158 displayed comparable activity to its parent molecule, 9029936, against pre-formed biofilms, planktonic cells, and displayed increased activity against the inhibition of biofilm formation. Analogue 67158 was also able to inhibit filamentation under filament induc-

ing conditions and displays comparable activity against drug resistant *C. albicans* strains exhibiting various drug resistance mechanisms. This suggests that these two compounds could potentially lead to novel ways to treat candidiasis. Our future direction includes identification of the molecular mechanism of action, as well as animal model studies. This work increases our understanding of virulence and therapeutic strategies relating to *C. albicans* and pathogenic species in general. This work was supported by the UTRGV LSAMP funded by the National Science Foundation grant number HRD-1202008, the UTSA RISE-PhD Trainee Program (NIH/NIGMS RISE GM60655) and by grants R01DE023510 and R01AI119554 from the National Institute of Dental and Craniofacial Research and the National Institute of Allergy and Infectious Diseases, respectively.

**SESSION I, POSTER U-22**  
**PLANTS OF THE RIO GRANDE VALLEY USED IN THE TREATMENT OF DIABETES.**

*A BIOCHEMICAL STUDY Gonzalez Aleida, Mar Arnulfo, Ph.D., Department of Chemistry, The University of Texas Rio Grande Valley. Brownsville Campus, Brownsville, Texas 78520*

**ABSTRACT**

Our research involves the study of the biochemical properties of medicinal plants that are found in the Rio Grande Valley, and that are used in the treatment of diabetes by people in this area. We have compiled a list of the medicinal plants by visiting yerberías, or herb stores, and by gathering information from the local population. From this list, we have selected the most easily available and commonly used plants in the control of diabetes for biochemical studies. The plants we have currently are, Neem, *Justicia epecigera*, Moringa, Wereke (*Ibervillea sonora*), Phalaris Canariensis. In these studies, we have done the analysis of neutral buffer extracts to determine its biochemical characteristics. Among the techniques used are: UV-visible spectrophotometry, sugar content determination using the Benedict Reagent, amino acid analysis content by ninhydrin, protein test using the Biuret reagent, and SDS Electrophoresis, with proteins detection by Coomassie brilliant blue and silver stain. Future research plans call preparative column chromatography and HPLC analysis of plants extracts, isolation and characterization of plants DNA and enzymatic assays of the extracts.

**SESSION I, POSTER U-23**  
**THE DETERMINATION OF TEMPORAL AND SPATIAL PATTERNING OF WING DEVELOPMENT GENES IN COLLEMBOLA EMBRYO SPECIES**

*Grimaldo, Vincent, Joanne Rampersad-Ammons, Terry, Matthews Ph.D., Department of Biology, The University of Texas Rio Grande Valley*

**ABSTRACT**

The development and evolution of wings is a key innovation that has made insects the most biodiverse group of organisms on the planet. However, the evolutionary transitions involved in origins of insect wings remain a hotly debated topic. The two main competing theories of wing origin are the tergal hypothesis, which proposes wings evolved from extensions of thoracic tergum. The other theory, pleural hypothesis, proposes that they evolved from an outgrowth of pleural tissue. Genetic studies on holometabolous insects, primarily *Drosophila*, have identified several different genes involved in the designation and initiation of wing development. Data from nonholometabolous insects and other hexapods, such as *Collembola*, is limited. We have generated an embryological transcriptome for two species of *Collembola* and identified orthologues of several wing development genes. The primary goal of this study is to investigate the role these genes have in these apterygote development. Target genes include wingless (*wg*), vestigial (*vg*), apterous (*ap*), nubbin (*pdm/nub*), notch, and Fringe (*Fng*). We have amplified and cloned regions of these genes and are performing in fluorescent in situ hybridizations to determine the temporal and spatial patterning of these genes during *Collembola* embryogenesis. These data will paint a better picture of the role these genes used to play before they were co-opted for wing development and expand our understanding of the origin and development of the first winged organisms.

**SESSION I, POSTER U-24**  
**DEGROWTH IN THE RGV**

*Karina Guerrero, Angel Saavedra, Ph.D., Political Science Department, The University of Texas Rio Grande Valley*

**ABSTRACT**

Today, capitalism's severe social and ecological have become of greater importance due to global issues such as the 2007 food crisis that led many to starvation and poverty (Bello 2009). The continued global focus on economic growth must be reconsidered because "resource and CO2 limits render further growth of the economy unsustainable" (Kallis 2011, 873). This scenario begs the question of an alternative sustainable model for humanity. A relatively new approach has emerged in political economy as a response to these social and environmental concerns. The proposal of sustainable degrowth is a rejection of the need to "grow" an economy. Instead, this approach advocates the reduction of the production and consumption so intrinsic to our societies around the world. Sustainable degrowth calls for the realization that obtaining a high GDP should not be the goal of our countries; instead, sustaining a good quality of life for the environment and our people should take priority. Although this approach would require significant changes in government policy, it would require a shift at a more fundamental level: a shift in the attitudes and values of the people (Kallis 2011, 873). Endorsing degrowth requires citizens to cease giving the accumulation of material possessions such prime importance and ask them to consider major lifestyle changes. That is however at odds with an essential part of American culture, consumerism. The goal of this research program is to discuss why this approach may be so difficult to accept at the societal level and to test whether underrepresented populations can become accepting of the degrowth messages. We will do this by comparing the attitudes about degrowth, capitalism, and the environment among two different Hispanic populations in the Rio Grande Valley. By presenting the concept of degrowth to our participants we hope to better understand the factors that make people more or less likely to embrace this radical idea in nontraditional contexts.

## **SESSION I, POSTER U-25**

### **THE APPLICATION OF OSTEOGENIC INDUCING MICRO RNA FOR BONE TISSUE ENGINEERING**

*Astrid S. Gutierrez, Marco A. Arriaga, Sue Anne Chew, Ph.D., Department of Biomedical Sciences, The University of Texas Rio Grande Valley*

#### **ABSTRACT**

Bone defects are caused by trauma, genetic abnormalities, or diseases that affect how the body maintains bone density and their function overall. Bones can regenerate with time however, when the damage is extensive, a bone autograft or allograft is needed to aid the healing process. However, these traditional methods of repairing bone defects includes multiple invasive surgeries, the risk of infection, rejection of the graft, and a lengthy rehabilitation process. An alternative method to bone grafts is the use of bone tissue engineering. Bone tissue engineering applications uses biomaterials, bioactive factors and/or stem cells by themselves or in combination to regenerate a functional bone. Stem cells that are used for bone regeneration can be provided cues to help them differentiate into osteoblasts and osteocytes. Traditionally, growth factors in the protein form are often used to differentiate these cells. Transfecting mesenchymal stem cells (MSCs) with miRNA that are capable of inducing osteogenesis rather than introducing osteogenic inducing proteins to differentiate the cells may be more effective because proteins may lose their function and denature during the delivery process, are costly, and are difficult to produce. The objective of this project is to identify and test different miRNAs that can induce osteogenesis side by side to determine which are most effective in differentiating MSCs. The MSCs are transfected with the different miRNA and after 7 days, the protein and mRNA levels of osteogenic markers were measured and observed using western blots and real time quantitative reverse transcription (RT-qPCR), respectively. Through literature search, we have identified 10 miRNAs that are capable of inducing osteogenesis and observed different expression of protein and mRNA levels of early and late osteogenic markers. Our future work consists of evaluating these markers at different time points to conclude which miRNA is the most effective at inducing osteogenesis.

## **SESSION I, POSTER U-26**

### **THE USE OF CANNABIS AND ITS RELATIONSHIP WITH EMOTIONAL DISORDERS IN HIGH-SCHOOL STUDENTS FROM REYNOSA, TAMAULIPAS, MÉXICO**

*I. Paola Hernández-Lozano, MD1, Héctor. F. Gómez-Estrada, MD2, Antonio Gutiérrez-Sierra, MD1, Netzahualcoyotl Mayek-Pérez, DrSci1 / 1 School of Medicine, Universidad México Americana del Norte AC. Reynosa, Tamaulipas, México; 2 Centros de Integración Juvenil AC, Reynosa, Tamaulipas, México*

#### **ABSTRACT**

Changes and trends in drug use are not the same all over México. Border cities of the state of Tamaulipas behave differently: While drug use in Matamoros is low, Nuevo Laredo and Reynosa show high cocaine and heroin use. In addition, drug use is increasing among teens between 12 and 17 years of age. This work analyzed marijuana use in high school teens from Reynosa and its relationship with emotional disorders (anxiety and depression). Three high schools were selected to conduct the surveys. At each school, six groups were randomly selected: three from each morning and afternoon shifts and one of each degree. Data included 18 groups and 619 students 15 to 18 years of age. Some socio-economic and academic data were requested of each student. After, two surveys were applied, one was designed by 'Centros de Integración Juvenil AC' (CIJ) to determine use of marijuana and other substances; the second analyzed anxiety and/or depression symptoms. The drug use survey was more explicative than the anxiety/depression survey and no correlation was found between survey data. The highest values of anxiety/depression were found in younger women from the morning shift, while older men from the afternoon shift showed the highest values of marijuana and other substances used. Our results emphasize the necessity to maintain and even to broaden prevention efforts to reduce drug use in young people from Reynosa. This work was founded by Centros de Integración Juvenil AC (Reynosa) and Universidad México Americana del Norte AC.

## **SESSION I, POSTER U-27**

### **DEVELOPMENT OF A NATURAL PROTEIN SYNTHESIS SYSTEM FROM PSEUDOMONAS AERUGINOSA**

*Hughes, Casey, Bullard, James, Ph.D., Department of Chemistry, University of Texas Rio Grande Valley*

#### **ABSTRACT**

We are developing a protein synthesis system from *P. aeruginosa* composed of the ribosome and 15 accessory proteins. The 15 accessory proteins have been over-expressed and characterized. Accessory proteins consist of: PheRS, ArgRS, AspRS, GlnRS, GluRS, LeuRS, MetRS, ProRS, initiation factor-1 (IF-1), initiation factor-2 (IF-2), initiation factor-3 (IF-3), elongation factor Tu (EF-Tu), elongation factor Ts (EF-Ts), elongation factor G (EF-G) and methionyl-tRNA formyltransferase (MFT). Methods. To confirm the proteins were isolated in active forms, each was subjected to individual activity assays. aaRS proteins were analyzed using aminoacylation assays. A ribosome dependent GTPase assay monitored the activity of IF-2 and EF-G. EF-Tu and EF-Ts activities were monitored by GDP exchange assays. A ribosome dissociation assay was devised to monitor the activity of IF-1 and IF-3. The ability of MFT to formylate Met-tRNAMet was monitored by CuSO4 hydrolysis of formylated tRNAMet. A previously developed poly-U directed aminoacylation/translation (A/T) protein synthesis system was used to determine the effect of all components on ribosomal activity. Results. To ensure the activity of the A/T assay was not compromised by any one individual accessory component, the A/T assay was challenged by titration of each component into the assay. There was no decrease in activity observed in the presence of any accessory component. The A/T assay was also challenged by addition of non-accessory components (e.g. amino acid mix, T7 RNA polymerase, pseudo-natural mRNA). The ability to form 30S initiation complexes was determined in the presence of the initiation factors. The 30S initiation complex could be formed in the presence of only IF1 and IF2, however IF3 enhanced the formation of the complex. A pseu-

do-natural mRNA composed of high-usage codons corresponding to anti-codons recognized by each of the aaRS proteins present will be used to demonstrate protein biosynthesis. The presence of four codons encoding leucine at the 3' end of the transcript allows monitoring of full length peptide in the presence of 3H leucine. Conclusion. An optimized form of this system will be used for screening for chemical compounds that inhibit protein synthesis in *P. aeruginosa*. The system will allow us to rapidly detect which component of the system is inhibited. Research was supported by NIH grant 1SC3GM098173-01A1 and partial student support was from the NIH UTPA RISE program grant # 1R25GM100866-01 and from a Departmental Grant from the Robert A. Welch Foundation (Grant No. BG-0017).

## **SESSION I, POSTER U-28**

### **IMAGE CAPTURE OF FIBRIN AND PLATELET MATRIX USING NANOSCALE RESOLUTION OPTICAL MICROSCOPY**

*Lazaro Lopez Mendez, Michael Izaguirre, Juan Guevara, Jr., Ph.D., and \*Natalia Guevara, PhD, Biophysics Research Laboratory Department of Physics, The University of Texas at Rio Grande Valley, \*Biophysics Research Laboratory Director*

#### **ABSTRACT**

The conversion from fibrinogen to fibrin it is the product of the coagulation cascade, followed by the addition of platelets which play a key role in hemostasis and thrombosis. Knowledge of the mechanisms of fibrinogen to fibrin conversion in the last two decades has advanced in imaging methods including SEM, TEM, and AFM. However, few studies have prospectively examined the dynamics of its conversion to fibrin in optical microscopy and captured in vitro images. We have developed a method to capture the clot formation using a nanoscale resolution optical microscopy to visualize interactions between fibrin and platelets inside the matrix. A drop of blood was provided by the first author who shows no sign or clinical symptoms of illness or disease, several steps of centrifugation, and purification of the plasma to get rid of the RBCs and Leukocytes. A 13.75 microliter aliquot of plasma containing proteins and platelets was next drawn into a microcapillary tube for optical analysis. Images are captured and enhanced using algorithms in Photoshop and ImageJ. The study demonstrated a platelet rich fibrin matrix preserving their natural properties without the interaction of the RBCs. This method allowed us to analyze and classify the potential fibrin, platelet, and protein role in the crosslinked matrix. Future studies with this method include comparing different blood factors that trigger generation and hydrolysis of the fibrin matrix. Studies are supported by College of Science Seed Grant and NIH Grants SC2GM081218 and SC3GM099637 to N. V. Guevara, PhD, Principal Investigator, and AROSR Grant to J. Guevara Jr, PhD.

## **SESSION I, POSTER U-29**

### **FABRICATION OF MINOCYCLINE LOADED PLGA MICROPARTICLES USING THE O/W EMULSION SOLVENT EVAPO- RATION METHOD FOR THE TREATMENT OF GLIOBLASTOMA**

*Elizabeth Lopez, Daniela Barbosa, Jesus R. Franco, Sue Anne Chew, Ph.D., Department of Biomedical Sciences, The University of Texas Rio Grande Valley*

#### **ABSTRACT**

Glioblastoma is a very aggressive condition with an average life expectancy of 12 to 15 months after diagnosis. Many conventional treatment methods have not been effective in combatting glioblastoma, prompting a push to develop new treatments. A prevalent trait of glioblastoma is the recruitment of blood vessels that help nourish the tumor, or angiogenesis. Minocycline is an anti-angiogenic drug that can prevent the tumor from forming new blood vessels and subsequently impeding tumor growth. Previous studies have tested the local delivery of minocycline with scaffolds in conjunction with systemic delivery of a chemotherapeutic drug on rat models with promising results. Local delivery has the benefit of maximizing the amount of drug at the targeted area while minimizing the body's exposure to the drug at non-targeted sites, decreasing side effects. The ultimate goal of our project is to develop a local delivery biomaterial system to deliver both minocycline and a chemotherapeutic drug. The objective of this particular study is to optimize the oil in water (O/W) emulsion solvent evaporation fabrication method of minocycline loaded microparticles by altering different fabrication parameters [i.e. amount of DCM and minocycline as well as concentration of PVA]. The amount of drug released by the microparticles was determined by measuring absorbance at 350 nm by a microplate spectrophotometer and comparing to a minocycline standard curve. Increasing the amount of DCM used resulted in a better sustained drug release. Not surprisingly, increasing the amount of drug used during fabrication increased drug loading and drug left after the 14 day study. A 1% PVA concentration had a better sustained drug release compared to 0.1 or 2 % PVA concentration. In conclusion, changing the parameters of the O/W fabrication method altered the drug release kinetics and amount of drug loaded of minocycline loaded PLGA microparticles.

## **SESSION I, POSTER U-30**

### **BUILDING CONFIDENCE IN THE ELDERLY FOLLOWING POST STROKE**

*Lopez, Iris, Wang Lin, Ph.D., Department of Health and Human Performance, The University of Texas Rio Grande Valley*

#### **ABSTRACT**

Chosen studies, aided in collecting data for research on standing balance which were composed of patients ranging from 65-96 years of age. The purpose of this article is for an elderly patient to regain their confidence in maintaining their balance while standing following a stroke. A stroke can directly affect the ability to stand if the part of the brain lacks blood supply or a blood vessel to the brain is blocked. Because of this, patients may need to be retaught how to stand to regain motor function. This research presentation will focus on several methods that will specifically aid to help regain confidence, as well as possible tools that can assist in the rehabilitative process to regain an individual's trust to better facilitate their journey back to standing up again. In conclusion, goal setting and the use of the tools discussed are key in getting the elderly to regain confidence to stand after a stroke.



**SESSION I, POSTER U-31**

**REDOX AND ETHANOL CAUSE DETRIMENTAL MICROGLIAL PHENOTYPIC CHANGES VIA NF-KB SIGNALING**

*Ileana C. Lozano1, Giovanina A. Hinojosa1, Leslie L. Rivera-Lopez2, Feroz Akhtar2, Andrew Tsin2 and Shivani K. Maffi2, Department of Biology1, Department of Biomedical Sciences2, School of Medicine, University of Texas Rio Grande Valley, Edinburg, TX*

**ABSTRACT**

Microglia, the predominant immune cells of the CNS control brain damage by either signaling a classical neurotoxic inflammatory (M1 phenotype), or a neuroprotective (M2 phenotype) response. The purpose of the present study was to determine the effect of glutathione dysregulation and ethanol exposure on microglial dynamics and function. EOC13.31 microglia cells were divided into six groups: control, N-acetyl cysteine (NAC), Butathione Sulfoxamine (BSO), ethanol, ethanol + NAC, and ethanol + BSO. NAC and BSO was administered 18hrs prior to ethanol exposure for 24hrs. Western blotting and microscopy-scratch wound assays were performed to determine microglia migration and the underlying signaling mechanism. Confocal microscopy was used to further illustrate changes in phenotype. Increased processing of NF-kB p105 into p50 subunit, in the presence of ethanol exposure was observed. Under control and NAC treatment, microglia grew as a mixed population, consisting of predominantly rod-like structures in addition to a small percentage of rounded cells. Ethanol alone, BSO or BSO + Ethanol treatment resulted in > 50 % of microglia to adopt a round shape, even after 24 hrs-48 hrs of ethanol withdrawal. Pretreatment with NAC showed migration and presence of both rounded and elongated cells in the wound area after 48hrs, however, mitigated NF-kB subunit processing. Together, our results indicate that ethanol-induced oxidative stress diminishes microglia migration even after 48 hrs of exposure. Also, maintaining redox (GSH) levels promotes microglial migration up to 24-48hrs after ethanol exposure and most importantly antioxidants homeostasis enhances signaling towards M2 morphological changes that are neuroprotective.

**SESSION I, POSTER U-32**

**THE EFFECTS OF SOCIAL EXPERIENCE ON SOCIAL BEHAVIOR IN THE GRAY, SHORT-TAILED OPOSSUM (MONODELPHIS DOMESTICA)**

*Chelsea McKee1, Alejandra C. Camacho2,3, John VanDeberg4, Gabriel de Erausquin2,3, and Mario Gil1,2 Department of Psychological Science1; School of Medicine Department of Biomedical Sciences, Division of Neurosciences2, School of Medicine Department of Psychiatry and Neurology3, South Texas Diabetes and Obesity Institute4*

**ABSTRACT**

Social behavior is influenced by a number of factors including an individual's sex and prior social experience. In addition, research has shown that various sex differences in behaviors, such as activity levels, memory, and pain tolerance, exist for both animals and humans. Moreover, there are sex and gender differences in psychiatric and neurodevelopmental disorders, such as anxiety, depression, autism, and schizophrenia. The objectives of this study are to define and categorize the social behavior of the gray, short-tailed opossum (*Monodelphis domestica*) and determine the impact of social experience and sex on these behaviors. *Monodelphis domestica* is a highly aggressive and territorial species. However, to our knowledge, the effects of social experience on social behavior in a marsupial mammal have not been investigated. Following social isolation, each subject was paired with a same-sex (stimulus) partner for 10 min and behavior was recorded and scored using JWatcher (first social interaction test). Twenty-four hours after this first social interaction, the same animals were again paired for 10 min (i.e., to allow them to gain additional social experience), and a final 10-min social interaction test was conducted 24 hrs after that. Our preliminary data indicate that social experience decreases the durations of aggression and non-aggressive social contact in males and females. Interestingly, males were more likely to be physically engaging with their experimental partner through grabbing, biting, or tumbling, while females were more prone to jumping and fleeing. Additional studies that are currently underway aim to replicate these preliminary findings and determine whether stable dominant-subordinate relationships are formed between same-sex partners. A major long-term goal of our research program is to develop the *Monodelphis* as an animal model of neurodevelopmental disorders. Therefore, it is imperative to first characterize their behavior and identify environmental and experiential factors that influence these behaviors.

**SESSION I, POSTER U-33**

**EFFECT OF HUMAN GROWTH HORMONE ON A GLIOBLASTOMA-DERIVED CELL LINE VIABILITY**

*Cristian Mercado, St1, Devika Raju, St1, Victoria Hernandez, St1, Andrew Tsin, PhD1, Benxu Cheng, PhD1, Kevin Bermea, MD1 1 University of Texas Rio Grande Valley, School Of Medicine*

**ABSTRACT**

Human growth hormone (hGH) is a peptide responsible for the linear growth of the human. It is mainly secreted by the hypophysis, however, extrapituitary secretion has been detected with local activity in some tissues. By activating its receptor (GHR), hGH promotes the expression of insulin-like growth factor I (IGF-1), which is one of the most important growth factors and has been implicated in the pathogenesis of several diseases such as diabetes and cancer. GHR and GH expression has been detected in distinct types of cancer and tumor-derived cell lines such as breast, colon, prostate, glioblastoma cancers. The interest in characterizing its contribution in cancer is growing since many studies suggest hGH signaling as a potential target for some of this tumors. We used the U87 cell line, which is known to express GHR, treated it with hGH, and measured cell viability. Methods: In a 24 well plate we seed 20k cells per well, after 24 hours we treated with hGH at concentrations of 0, 0.1, 1, 10, 100, 1000 nM. After 24 hours, cell viability was measured using trypan blue dye exclusion method. Results: A dose dependent increase in the cell viability was observed, with an increase of approximately 50% at a 100 nM concentration and 100% at a 1000 nM concentration having an average of 270k and 360k, respectively, compared with 180k on the negative control. Future Directions: Measure the cell proliferation with GHR and/or hGH KO, scale research to animal model. Research Supported by Dept. Biomedical Sciences, SOM/UTRGV.

**SESSION I, POSTER U-34**

**HEALTH BENEFITS OF RUNNING WITH PROPER FORM**

*Francisco Mireles, Clemente Gallo, Marcelino Rangel, Rodrigo Gomez, Wang Lin, Ph.D, Department of Health and Human Performance, The University of Texas Rio Grande Valley*

**ABSTRACT**

There are several benefits of running and how it can impact our health. The information gathered in this research project is based on what running form is most suitable for each individual to prevent any risk of injuries that might stop one from running, because running is essential to our health. Also, we look at the health benefits of running, as well some of the diseases we can prevent in our bodies. We also will be discussing when, where, and why to run. Diets are very crucial before a run, therefore it is important to know what kind of fuel we will want in our bodies. There are several positive outcomes that we can demonstrate throughout our project. With regard to running form, we were able to discern that there is no correct running form. The runner's natural stride should not be drastically changed. Posture and breathing technique can also improve a runner's performance. Improving the runner's cadence can result in a lesser chance of injury due to overuse and impact. Even so, injuries are not completely unavoidable. It is also important to note that running uphill and downhill has major benefits to your body. It's understood that hill training improves your health, as well, but doing too much hill training may also cause injury.

**SESSION I, POSTER U-35**

**VALIDATION OF IDYLLA PLATFORM FOR DETECTION OF MUTATIONS IN KRAS AND NRAS GENES IN MEXICAN PATIENTS WITH COLORECTAL CANCER**

*Karen Moreno1, B.Sc., Claudia Luna1, PhD., Monica Villareal1, B.Sc., Hector Sanchez1, B.Sc., Esteban Lopez-Tavera1, B.Sc., Ricardo Cerda2, Hugo Barrera-Saldaña1, PhD. / Genomic Bioanalysis Laboratory, Vitaxentrum, SA de CV. Monterrey, Mexico 2. Nursing School, Universidad Autónoma de Nuevo León, México*

**ABSTRACT**

The implementation of personalized medicine depends on two principal factors: the pharmacokinetic variability of drugs and genotyping of DNA biomarkers. In patients with colorectal cancer, the administration of therapy with the monoclonal antibody Panitumumab needs the determination of RAS mutational status. In this regard, the Idylla™ platform provides a sensitive and fully-automated molecular test that allows KRAS, NRAS, BRAF and EGFR analyses. The main objective of this study was to validate the detection of mutations in KRAS and NRAS genes in Mexican patients with colorectal cancer by comparing the performance of Idylla platform to the gold standard, Sanger Sequencing. In case of discordance, samples were further assessed by a third method such as quantitative polymerase chain reaction (qPCR). For statistical analysis of concordance and validation, EpiTad version 3.0 was employed. The results obtained from 118 cases analyzed by Idylla platform in KRAS analysis agreed with Sanger sequencing analysis, with an overall concordance of 90.22% with Kappa statistic of 0.794, standard error 0.07 (confidence interval: 95%, 0.67-0.92) and sensitivity of 86.1%. In contrast, NRAS analysis resulted in an overall concordance of 100% with Kappa statistic of 1.000, standard error 0.00 (confidence interval: 95%, 1.00-1.00) and sensitivity of 100%. Idylla platform is an automated system that enables the analysis of KRAS and NRAS mutations and allows the samples to be processed in a very short time with high sensitivity and specificity.

**SESSION I, POSTER U-36**

**PREVALENCE OF NEGLECTED TROPICAL DISEASES IN CAMERON COUNTY**

*Cindy Nguyen, Cherity Ysquierdo, MS, Susan Fisher-Hoch, MD, Joseph McCormick, MD UTHHealth School of Public Health, Brownsville, TX*

**ABSTRACT**

Neglected tropical diseases disproportionately affect more than a billion of the world's most impoverished people. Population based studies of this group of diseases in the US is largely lacking. Objective: We are undertaking this study to assess the prevalence of eight NTDs in South Texas, including viral infections such as dengue, chikungunya and Zika, as well as parasitic infections such as ascariasis, Chagas disease, leishmaniasis, echinococcosis, and strongyloidiasis. Methods: We selected 305 subjects from the randomly recruited Cameron County Hispanic Cohort and performed a series of enzyme-linked immunosorbent assays (ELISAs) to detect IgG and IgM antibodies to these viruses and parasites. Results: Preliminary results suggest a previously observed high prevalence of IgG antibody to dengue (~50%). Prevalence of newly diagnosed chikungunya is 4.5%. Prevalence of antibodies to parasites ranges from 3.4% to Chagas, 10% to Ascaris, and 8.9% to chinococcus. Future work focuses on conducting more serological tests and examining the underlying risk factors for these diseases. Defining prevalence and risk factors are the first steps to addressing the public health importance of this group of infections. This study is funded by grant 537-18-0332-00001 from the Texas Department of State Health Services.

**SESSION I, POSTER U-37**

**THE PURIFICATION AND CHARACTERIZATION OF C-TYPE LECTINS FROM CROTALUS OREGANUS HELLERI (SOUTHERN PACIFIC RATTLESNAKE) VENOM**

*Victoria Parra1, Montamas Suntravat1, Elda E. Sánchez1&2 1 National Natural Toxins Research Center, Texas A&M University-Kingsville, Kingsville, TX;2 Department of Chemistry, Texas A&M University-Kingsville, MSC 161, Kingsville, TX*

**ABSTRACT**

Snake venom contains an abundance of functionally distinct molecules. Among the non-enzymatic proteins, the C-type lectins (CTL) are of particular interest. A CTL is a calcium dependent, carbohydrate-binding protein that has a high specificity for sugar moieties. These proteins are capable of binding reversibly to glycoproteins found on the extracellular membrane, which modulate cell-to-cell interactions. Currently, two distinct groups of CTLs isolated from snake venoms are being investigated: true C-type lectins and C-type lectin-like proteins (CLP). Both the CTLs and CLP have been identified as having profound activity in the inhibition of cellular proliferation. Even more recently, CTLs isolated from other venoms, have gained recognition for possible antimicrobial effects against gram-positive and gram-negative bacteria. The focus of this study is to isolate and characterize Hellericetin, a C-type lectin purified from the venom of *Crotalus oreganus helleri* (Southern Pacific Rattlesnake), and to determine its biological functionality on human endothelial cells in vitro. Viper Resource Grant #P40OD01960.

#### SESSION I, POSTER U-38

##### DEVELOPMENT OF PROLYL-TRNA SYNTHETASE FROM PSEUDOMONAS AERUGINOSA AS A PLATFORM TO SCREEN FOR INHIBITORS OF PROTEIN SYNTHESIS

Noah Peña, Yanmei Hu, and James M. Bullard, The University of Texas Rio Grande Valley, Edinburg, TX USA

##### ABSTRACT

Introduction: Pseudomonas aeruginosa is an opportunistic pathogen and a common cause of nosocomial infections. Aminoacyl-tRNA synthetases (aaRSs) are a class of enzymes that catalyze the covalent attachment of amino acids to their cognate tRNAs during protein biosynthesis. We describe here the enzymatic characterization and development of a screening platform based on prolyl-tRNA synthetase (ProRS) from P. aeruginosa. Results: ProRS from P. aeruginosa was cloned and expressed in E. coli and purified to greater than 98% homogeneity. Sequence analysis shows that this protein contains the characteristic motifs of class I aminoacyl-tRNA synthetases and when compared with E. coli exhibited approximately 70% amino acid sequence conservation. The kinetic parameters for the interaction of P. aeruginosa ProRS with its three substrates (tRNA, ATP, and proline) were determined. Initial velocities were determined for charging of tRNA using tRNA<sup>Pro</sup> concentrations between 0.8 and 3 μM. The K<sub>M</sub> and V<sub>max</sub> was determined to be 7 μM and 0.67 μM min<sup>-1</sup>, respectively, resulting in an observed k<sub>cat</sub> of 0.22 sec<sup>-1</sup>. This resulted in a k<sub>cat</sub>/K<sub>M</sub> value of 0.033 s<sup>-1</sup>μM<sup>-1</sup>. The ATP:PP<sub>i</sub> exchange reaction was used to monitor the interaction with ATP and proline (Pro). The K<sub>M</sub>, V<sub>max</sub>, observed k<sub>cat</sub>, and k<sub>cat</sub>/K<sub>M</sub> for interaction with ATP was 700, 168, 14, 0.02, respectively. Scintillation proximity assay (SPA) technology was adapted to the aminoacylation assay and then used to screen for inhibitors of activity of P. aeruginosa ProRS in a high throughput format. Using this assay, a natural product (800 compounds) and a synthetic compound (890 compounds) library was screened. Conclusion: ProRS identified in P. aeruginosa was cloned, expressed characterized and developed into a screening platform to identify compounds that have the potential for development as an antibacterial agent against pathogenic organisms. Research was funded by NIH grant 1SC3GM098173-01A1. Partial student support was from a Departmental Grant from the Robert A. Welch Foundation (Grant No. BG-0017) and the NIH UTPA RISE program grant # 1R25GM100866-01.

#### SESSION I, POSTER U-39

##### THE ACUTE EFFECTS OF DIFFERENT INTER-SET RECOVERY APPROACHES ON KNEE EXTENSION ENDURANCE

Carlos Portales, Elizabeth Castillo, Victor Borrego, Karen Carmona, Amber Cavazos, Murat Karabulut, PhD1 1 University of The Rio Grande Valley, Brownsville, Tx

##### ABSTRACT

The purpose of this study was to examine the acute effects of inter-set recovery approaches on knee extension endurance. A total of 11 males (Mean ± STDEV age = 22.3 ± 1.7 years; height = 1.71 ± 0.06 m; between the ages of 18 and 24 years participated in the study. The subjects were examined on the acute effects of inter-set recovery approaches on knee extension endurance, heart rate (HR), and blood pressure (BP). For each session, the participants warmed-up with knee extensions at 35% of their 1-RM for 10 reps. There were 2 sets of knee extensions per session, with a recovery approach of three minutes being implemented between each set. The recovery approaches consisted of a power plate, dynamic stretching, foam rolling, and rest. The knee extensions were performed at 60% of the participant's 1-RM until failure. The sessions concluded by recording the subject's blood pressure, and heart rate every 5 minutes for a total of 15 minutes. Foam rolling significantly improved recovery and performance when compared to dynamic stretching (p= <0.05). Comparing the percent change of foam rolling to dynamic stretching, there was a significant acute effect on muscular endurance. This concluded that foam rolling enabled the participant to complete the same number of repetitions done in the previous set. Therefore, foam rolling could benefit people who are participating in an exercise training program who seek a recovery modality that is affordable, and that can enhance both muscle recovery and performance. To improve the results of this research, it would be beneficial to increase the number of sessions given to the participants.

#### SESSION I, POSTER U-40

##### PSYCHOLOGICAL STRESS, INFLAMMATORY STATUS AND DIETARY HABITS IN COLLEGE STUDENTS IN US-MEXICO BORDER UNIVERSITY

Preethi, Raju, Hongxing Lu, Ph.D., Department of Health and Biomedical Sciences, Psychological Stress, Inflammatory Status and Dietary Habits in College Students in US-Mexico Border University Preethi Raju1, Hongxing Lu1, Florentino Saenz1, Ednia

##### ABSTRACT

Gutierrez1, Loreanne Tostado1, Saraswathy Nair1 1Dept. of Health and Biomedical Sciences University of Texas Rio Grand valley Background: The psychological stress may be related with obesity via their possible effects on inflammation and lifestyle. The results were controversial in different population. The purpose of this study is to examine the possible relationship between perceived stress level, inflammatory status and dietary behaviors in college students in the US-Mexico border university. Methods: The college subjects (N=40) with aged 18-25 years were recruited. Body weight, height, waist circumference, and blood pressure were measured. The concentrations of salivary CRP and IL-2 were determined via Elisa methods. The Perceived Stress Scale (PSS) 10 items and Diet History Questionnaire were used to determine psychological stress level and food intake, respectively. Results: In this study, the mean perceived stress scale (PSS) was 21.00±3.89. The PSS levels were significantly related with body weight index (BMI) and waist circumference (p < 0.05). The students with increased stress took less fruit and vegetable, but more meat (p < 0.05). The salivary concentration of CRP and IL-2 were increased with high BMI and waist (p < 0.05). No significant associations between salivary CRP and IL-2 value, and stress scale, food consumption were observed in this study. Conclusions: The increased psychological stress was associated with unbalanced dietary habits and raised risk of obesity. The salivary cytokine level were positively related with body weight status, independently stress in young college students. No funding

#### SESSION I, POSTER U-41

##### PRE-OSTEOBLAST PROLIFERATION ON FIBROUS MATERIAL FOR POSSIBLE BONE REGENERATION

Cristobal Rodriguez1, Victoria Padilla3, Karen Lozano3, and Robert Gilkerson1, 2 1Department of Biology, 2Department of Clinical Laboratory Sciences, 3Mechanical Engineering Department, The University of Texas Rio Grande Valley, Edinburg, TX. USA.

##### ABSTRACT

Nanofiber display characteristics resembling the extracellular matrix (ECM), including large surface area and high aspect ratio, which has to extensive research on their suitability for a variety of physiological applications. Here, we explored the ability of bone precursor cells to adhere and proliferate on nanofibers composed of Polyhydroxybutyrate (PHB), a bio-degradable polymer, and Poly-lactic acid (PLA), with a biodegradable and biocompatible properties. The application of Zinc Oxide (ZnO), was also utilized due to its antibacterial properties, which provide the proper environment for cell growth. Mouse calvaria preosteoblast (MC 3T3) cells were used to compare cell proliferation between samples composed of PHB and PLA, with and without ZnO, with different concentrations and fiber spinning parameters. In multiple experiments, run over a 5 day time course, polyhydroxybutyrate (PHB) was shown to display robust cell proliferation and adhesion, compared to poly-lactic acid (PLA) fibers. Further research is needed to fully understand the interaction of this fibrous material with pre-osteoblast cells, for the possible application of bone regeneration. The authors gratefully acknowledge support received by NSF PREM award under grant No. DMR-1523577: UTRGV-UMN Partnership for Fostering Innovation by Bridging Excellence in Research and Student Success.

#### SESSION I, POSTER U-42

##### THE EFFECTS OF VIDEO GAMES ON MOTOR LEARNING

Dagoberto Rodriguez, Marysol Luna, Brenda MArtinez, Dani Talamantez, Wang Lin, Ph.D., Department of Health and Human Performance, The University of Texas Rio Grande Valley

##### ABSTRACT

Our research focuses on video games positive or negative effects on the school age population. This research was conducted by a group of college students that was intrigued to see if gaming affected the players' cognition, problem solving strategies, as well as critical thinking. The research was performed on different articles that are available regarding this subject. Gaming has become a lifestyle in American culture, and some studies had shown that extensive hours of video game playing could affect the brain and behavior of the players. Some research shows that there are action games that have some violent content that is not appropriate for the population that is playing the actual game. Some other action games have proven to increase the cognitive function, as well as the ability to mentally rotate objects, these games are called "brain games." There is still research that is being done regarding the issue of whether video games impact the cognitive aspect in the school aged population in a positive or negative way. Our research will dive in both positive and negative effects on the students' brains.

#### SESSION I, POSTER U-43

##### BDELLOVIBRIO SPP. ISOLATED FROM SOIL AND SEWAGE IN REYNOSA, MEXICO SHOWED PREDATORY POTENTIAL AGAINST DIFFERENT GRAM-NEGATIVE BACTERIA

L. E. Salazar-Villarreal1, 3, O. O. Oyedara1, 2, S. N. Rodriguez-Flores1, 3, S. B. Akinde2, M. A. Rodriguez-Perez1 / 1Instituto Politécnico Nacional, Centro de Biotecnología Genómica, Reynosa, Tamaulipas 88710, México. / 2Department of Biological Sciences, Faculty of Basic and Applied Sciences, Osun State University, Osogbo, Nigeria. / 3Universidad Autónoma de Nuevo León, Facultad de Ciencias Biológicas, Ciudad Universitaria, San Nicolás de los Garza, Nuevo León.

##### ABSTRACT

Bdellovibrio spp. are highly motile ubiquitous Gram negative obligate predatory bacteria that prey upon other Gram-negative bacteria for nutrients and reproduction. In this study, soil and sewage samples were collected at different locations in Reynosa Tamaulipas, Mexico. Bdellovibrio spp were isolated using double layer agar plating technique and three members of the family Enterobacteriaceae as prey (Klebsiella sp., Salmonella sp. and Citrobacter freundii CDBB-B-955 (ATCC 8090). Prey range of the isolated Bdellovibrio strains were determined using 36 different Gram negative bacteria. Four Bdellovibrio strains designated SKB1291214, SSB218315, SCRB3 (from soil) and SKUVM1 (from sewage) were isolated. The Bdellovibrio strains lysed their prey by forming plaques on dilute nutrient broth agar. The atomic force microscopy examination revealed the isolated Bdellovibrio strains as curve shaped Gram negative bacteria in interaction with their prey. Bdellovibrio strain SKB1291214 was able to lyse 13 out of 36 (36.11 %) bacterial isolates considered for prey range analysis while Bdellovibrio strain SSB218315 was able to prey upon 22 (61.11 %) bacterial isolates. Bdellovibrio strains SKUVM1 and SCRB3 exhibit same prey range pattern utilizing 28 (77.7 %) bacterial strains as prey. The ability of the isolated Bdellovibrio strains to lyse the members of the Enterobacteriaceae and other Gram-negative bacteria indicates that they have potential application as a biocontrol agent against pathogenic strains of Gram-negative bacteria



#### **SESSION I, POSTER U-44**

##### **STRUCTURE-ACTIVITY RELATIONSHIP OF NOVEL RGD-CONTAINING CYCLIC PEPTIDES AGAINST AVB3 INTEGRIN**

*Aaron Silva*<sup>1</sup>, *Yan Wang*<sup>2</sup>, *Wenwu Xiao*<sup>2</sup>, *Kit S. Lam*<sup>2</sup>, *Yonghong Zhang*<sup>1</sup> / <sup>1</sup>*Department of Chemistry, University of Texas Rio Grande Valley, Edinburg, Texas* <sup>2</sup>*Department of Biochemistry and Molecular Medicine, University of California Davis Cancer Center, Sacramento, California*

##### **ABSTRACT**

$\alpha v\beta 3$  integrin is a receptor for many extracellular matrix proteins with RGD-sequence motif, involved in multiple physiological processes. It is highly expressed in tumor cells, therefore a target for cancer therapy. It has been of great interest to develop RGD-containing ligands against the integrin. Two RGD-peptide isomers were recently screened as antagonists with dramatically different binding affinity, but structures are unknown. We present the solution structures of two isomers determined by NMR. Structure analysis reveals they adapt in entirely different conformations, provide new insight into the ligand recognition specificity of integrins and valuable clues for rational design of novel antagonists.

Funding for this project has been made possible by the Engaged Scholar Award awarded by the UTRGV Office of Engaged Scholarship & Learning.

#### **SESSION I, POSTER U-45**

##### **RISK FACTORS FOR SEXUALLY TRANSMITTED DISEASES AMONG UTRGV STUDENTS**

*Guadalupe Navarro*<sup>1</sup>, *Esa Aalto*<sup>1</sup>, *Michelle Castillo*<sup>1</sup> and *Liza Talavera-Garza*, Ph.D. <sup>1</sup>*Dept. of Psychological Science, The University of Texas Rio Grande Valley*

##### **ABSTRACT**

After years of decline, sexually transmitted diseases (STDs) in the U.S. have begun increasing again in recent years. Those between the ages of 15 and 24 are at the highest risk of acquiring an STD. Factors related to the spread of STDs include inconsistent and incorrect use of condoms and the failure of young adults to adhere to national screening recommendations. This study examined STD risk factors among UTRGV students. Objective: The purpose of the current study was to compare rates of STDs, condom use, and receipt of routine gynecological exams among UTRGV students to rates for a national sample of college students. Method: We conducted a secondary data analysis of the Fall 2016 administration of the National College Student Health Assessment II, which contains questions on college student health and health behaviors, to determine whether there were significant differences between UTRGV student rates and those of the national comparison group. Results: UTRGV students reported significantly fewer STDs (1% compared to 3.5%,  $p < .001$ ), but also significantly lower rates of condom use among sexually active students (39.2% compared to 48.4%,  $p < .001$ ) and routine gynecological exams in the last 12 months for females (27.2% compared to 41.6%) compared to the national college student sample. Conclusion: Although the rate of diagnosed STDs is lower among UTRGV students compared to that of college students in general, it's possible that the true rate is higher among our students given their lower rates of condom use and gynecological exams. The results of this study can be used in planning educational programs at UTRGV that raise awareness regarding increasing STD rates and that promote safe sex behaviors and the importance of routine screening.

#### **SESSION I, POSTER U-46**

##### **ASSOCIATIONS BETWEEN HEALTH BEHAVIORS AND PHYSICAL AND MENTAL HEALTH IN UTRGV STUDENTS**

*Brenda Castillo*<sup>1</sup>, *Daniel Rodriguez*<sup>1</sup>, and *Liza Talavera-Garza*, Ph.D. <sup>1</sup>*Dept. of Psychological Science, The University of Texas Rio Grande Valley*

##### **ABSTRACT**

UTRGV poor health behaviors established during the college years can contribute to the development of chronic diseases in later adulthood. This may be of particular relevance to UTRGV students due to the higher than average rates of obesity and diabetes in the Rio Grande Valley. Objective: The purpose of the current study is to compare rates of selected health behaviors among UTRGV students to those of a national college student sample. In addition, the associations between health behaviors and physical and mental health will be examined. Method: A secondary data analysis of the Fall 2016 administration of the National College Health Assessment II (NCHA II) to UTRGV students will be conducted. The NCHA II is a yearly survey of college students' health and health behaviors. Analyses will be carried out to examine whether there are significant differences between UTRGV students and the general college student population on levels of vigorous and moderate physical activity, intake of fresh fruits and vegetables, and sleep duration. Additionally, regression analyses will be conducted to evaluate whether the health behaviors examined are associated with body mass index, perceived physical health and mental health. Expected results: It is expected that UTRGV students will have lower rates of healthy behaviors than the national college student population and that engaging in fewer health behaviors will be associated with poorer mental and physical health outcomes. Conclusion: The college years have been considered an overlooked period for establishing positive health behaviors. The results of the current study have implications for planning and implementing health behavior promotion programs at UTRGV in order to reduce the risk of chronic health problems among our students.

#### **SESSION I, POSTER U-47**

##### **THE ACUTE EFFECTS OF SUPPLEMENTAL CITRULLINE MALATE ON HEART RATE, BLOOD PRESSURE, ARTERIAL ELASTICITY, AND ANAEROBIC PERFORMANCE.**

*Troncoso, Luis, Karabulut Murat* Ph.D, *Department of Health and Human Performance, University of Texas at Rio Grande Valley, Brownsville, TX.*

##### **ABSTRACT**

The purpose of this study was to examine the effects of supplemental Citrulline Malate (CM) on lower body when exercising. METHODS: A total of 16 females (Mean  $\pm$  STDEV age = 24.06  $\pm$  6.16 ; height = 61.88  $\pm$  2.73 in ) and 14 males (Mean  $\pm$  STDEV age= 22.43 $\pm$  2.34; height = 69.29  $\pm$  3.22 in ) between the ages of 18 and 43 participated in the study. Subjects performed two sessions of lower body exercise. Each session consisted of a warm up and two leg exercises; leg extensions and hamstring curls for two sets each with 75-80% of the subject's 1 RM. The subject was required to perform two sets of

maximum number of repetitions within 30 seconds; a 2-4-min resting period was then allowed. After exercise completion, the subject transitioned to the second leg exercise following previous protocol. After the second exercise, hemodynamic variables were measured at 0, 15, and 30 min post. The same procedure was performed at least three days after the first session, and the same protocol was performed with placebo or CM. RESULTS: There was no significant condition effects for hemodynamics variables that include: diastolic blood pressure ( $p = .877$ ), heart rate ( $p = .588$ ), small arterial elasticity ( $p = .745$ ), vascular impedance ( $p = .599$ ), or hamstring curls ( $p = .36$ ). A notable positive trend for large arterial elasticity ( $p = .085$ ), systolic blood pressure ( $p = 0.08$ ), and systemic vascular resistance ( $p = .054$ ) was discovered. In addition, a significant difference for leg extensions ( $p = .021$ ) was found. CONCLUSION: CM supplementation did not demonstrate a significant improvement in hemodynamic variables. This could be due to the location of the sensor (radial artery) during testing and the mode of the exercises performed (lower body resistance training exercises). However, CM showed an improvement in endurance for leg extension exercises, which could be due to a greater vasodilation response.

#### **SESSION I, POSTER U-48**

##### **GENE EXPRESSION SIGNATURE FOR TRIPLE-NEGATIVE BREAST CANCER USING FROZEN FRESH TISSUE**

*Grecia I Uscanga-Perales*, MS,<sup>1</sup> *Sandra K Santuario-Facio*, PhD,<sup>2</sup> *Servando Cardona-Huerta*, MD,<sup>3</sup> *Francisco Hernandez-Cabrera*, PhD,<sup>4</sup> and *Rocio Ortiz-Lopez*, PhD.<sup>2</sup> <sup>1</sup>*Universidad Autonoma de Nuevo Leon, Facultad de Medicina, Departamento de Bioquimica y Medicina Molecular, Monterrey, Nuevo Leon, Mexico;* <sup>2</sup>*Tecnologico de Monterrey, Escuela Nacional de Medicina, Monterrey, Nuevo Leon, Mexico;* <sup>3</sup>*Tecnologico de Monterrey, Hospital San Jose, Centro de Cancer de Mama, Monterrey, Nuevo Leon, Mexico;* <sup>4</sup>*Universidad Autonoma de Nuevo Leon, Facultad de Ciencias Fisico Matematicas, Centro Investigación en Ciencias Fisico Matemáticas, Monterrey, Nuevo Leon, Mexico.*

##### **ABSTRACT**

Triple negative breast cancer (TNBC) defined by the absence of hormone receptor (ER / PR) and HER2 expression is characterized by poor prognosis and short periods of recurrence. Due to the lack of targeted therapy of these tumors, several studies have been accomplished to identify biomarkers or therapeutic targets for this type of cancer. Previously our work group performed a global analysis of gene expression of TNBC and non-TNBC in a homogeneous population from north-eastern Mexico and proposed a group of genes differentially expressed in TNBC. The purpose of the study was to characterize this set of distinctive genes from a population of patients from northwest Mexico with TNBC compared to patients with non-TNBC. We performed the RNA isolation of 40 samples of fresh tissue obtained from TNBC and non-TNBC biopsies before neoadjuvant chemotherapy and 30 samples kept the quality criteria and proceeded to perform the RT-PCR. Finally the QPCR of the genes ANKRD11, LPIN1, UGT8, FOXC1 and BCL11A was performed using GRAMD1A as endogenous gene. Kolmogorov's tests were performed using a p value  $< 0.01$ . This study validates the overexpression of ANKRD11, FOXC1, LPIN1, UT8 and BCL11A as a genomic signature that characterizes CMTN phenotype in our population. This work was supported by CONACYT-Mexico through an approved grant (SALUD-CONACYT-2011-C01-162301). We are very grateful to the personnel of the Unidad de Genomica, Centro de Investigacion y Desarrollo en Ciencias de la Salud, Universidad Autonoma de Nuevo Leon for their technical assistance.

#### **SESSION I, POSTER U-49**

##### **ASESMENT OF SPATIAL MEMORY AND MOTOR COORDINATION BEHAVIORS IN MONODELPHIS DOMESTICA (OPOSSUM)**

*Yammile Vargas*, BS<sup>1</sup>, *Rogelio Montes*, BS<sup>2</sup>, *Leslie L. Rivera-Lopez*, BS<sup>2</sup>, *John VandeBerg*, PhD<sup>3</sup> and *Annelyn Torres-Reveron*, PhD<sup>2</sup> <sup>1</sup>*Dept. of Health Affairs, University of Texas at Rio Grande Valley, Brownsville, TX;* <sup>2</sup>*Dept. of Biomedical Sciences, Division of Neurosciences, School of Medicine, University of Texas at Rio Grande Valley, Edinburg, TX;* <sup>3</sup>*South Texas Diabetes and Obesity Institute, University of Texas at Rio Grande Valley, Edinburg, TX.*

##### **ABSTRACT**

The traditional animal models used for neurodevelopmental studies employ rodents. In contrast to rodents, opossums are born at a developmental stage equivalent to a human embryo at 6 weeks of gestation and continue developing extra-uterine, allowing for easy manipulations of the brain to take place. With this goal in mind, the characteristic behavior of pups during early development needs to be established. We tested behaviors related to memory and motor coordination, as these are largely affected in various developmental pathologies. Male and female opossums 6 months of age (sexual maturity) were used. Spatial learning and memory were measured using the Barnes maze test, which consists of placing the animals in a brightly lit, circular open arena divided into quadrants, with 20 holes around the perimeter. One of the holes leads to an escape box for the animal. The animal was allowed 2 minutes to find the escape hole; if the animal did not locate the escape hole, it was manually led to the target. We measured escape hole latency, as well as the time spent in each quadrant exploring. During training, females located the escape hole faster than males and needed less assistance. However, 24-hours later, males located the escape target faster. Motor coordination was assessed using the Rotarod test. The animals were placed on a horizontal rod that rotates at alternating speeds; the animal must walk forward to remain upright and not fall off. The number of rotations around the rod, and the latency to fall off were measured. Males showed increased latency to falling off the rod as well as running greater distances compared to females. These results will be added to our ongoing study in establishing the laboratory opossums as a viable model for assessing developmental insults in brain functioning and behavior. Funding: UTRGV-Internal Research Grant.

**SESSION I, POSTER U-50****STROKE PREVALENCE IN THE HISPANIC COMMUNITY: AN INTRODUCTION TOWARDS REHABILITATION AND PREVENTION**

Jonathon Vasquez, Robynn Claire Carin, Xamara J. Hernandez, Jaime Cavazos, Jose L. Garza, Lin Wang Ph.D, Department of Kinesiology, The University of Texas Rio Grande Valley

**ABSTRACT**

One of the fastest growing populations in the United States is at risk. Of all the stroke cases in the nation, 53% involved Mexican Americans. Among the many health risk factors for strokes, Hispanic Americans in the Rio Grande Valley are at risk for becoming exposed to three of the major ones such as diabetes, heart disease and obesity (1). The dangers of stroke lie in either the blockage of blood flow for longer than a few seconds to the brain, or the rupture of vessels within the brain (9). When this occurs, lasting damage to the brain can follow which may lead to a long term disability. Although, making preventative lifestyle choices is the ultimate solution against this prevalent disease, the low socioeconomic status surrounding this region impedes the numbers of stroke cases from decreasing. Therefore, it is important to educate the Hispanic community with a brief lecture on what can cause a stroke. This would lead to an introduction of the medical group of specialists behind the rehabilitation, and two forms of exercise therapies commonly utilized. Furthermore, with today's expansion in technological advances, it is crucial to become familiarized with some of the modern therapeutic ways to recover from a stroke. While strokes primarily affects the patient it is essential to be aware of the psychosocial toll that may transfer on to the family as well. Effective outcomes that produce the strongest evidence towards stroke rehabilitation involved diverse teams of specialists that focused on the transition from early patient care to patient long term recovery. However, direct assignation between a specific therapy and a specific group of stroke patients remains a game of trial and error. This is largely due to the lack of incorporation of successful widespread studies into one well-designed study for the treatment of stroke rehabilitation.

**SESSION I, POSTER U-51****BENZOIC ACID DERIVATIVES BY VIRTUAL SCREENING AS POTENTIAL TRANS-SIALIDASE INHIBITORS OF TRYPANOSOMA CRUZI**

Lenci K. Vázquez Jiménez, MC1, Muhammad Kashif, MC1, Carlos A. García Pérez, Ph.D1, Alma D. Paz González, M.C1, Virgilio Bocanegra-García, Ph.D1, Gildardo Rivera Sánchez1\* / 1 Laboratorio de Biotecnología Farmacéutica, Centro de Biotecnología Genómica, Instituto Politécnico Nacional, Reynosa, México

**ABSTRACT**

Chagas disease caused by the parasite Trypanosoma cruzi is an epidemiological, economic and social problem worldwide. Currently, the enzyme trans-sialidase of T. cruzi (TcTS) is an attractive tripanomicide target for the development of new inhibitors as a possible therapeutic action. Several authors have reported benzoic acid derivatives as inhibitors of TcTS; therefore, in this work a virtual screening was carried out based on ZINC database structure and molecular docking on TcTS. We analyzed 35 million compounds that make up the ZINC database, from which 5,000 compounds were obtained using the first inclusion criterion based on structural similarity. Subsequently, 1940 compounds were selected that complied with the Lipinski rule, which were analyzed by molecular docking on TcTS. Analyzing the interaction of 2,3-dehydro-N-acetylneuraminic acid (DANA) with the enzyme TcTS, the binding energy value of -7.7 Kcal/mol was obtained as the reference point, which allowed us to select 487 compounds with a binding energy higher than the value of the natural substrate DANA, establishing ten leading compounds. Through the analysis of the molecular coupling it was possible to determine that these compounds interact with amino acids like Asp59, Tyr342, Glu230, Tyr119, Trp312 and Glu362. Based on a virtual screening and molecular coupling on the TcTS, 487 new benzoic acid derivatives with a binding energy value higher than DANA were determined, which can be considered as potential TcTS inhibitors. Funding source: CONACyT, CB 2014-01, 241615.

**SESSION I, POSTER U-52****NOVEL NANOTECHNOLOGY APPROACH TO TARGET CANCER- SWITCH FROM PROTO-ONCOGENE TO TUMOR SUPPRESSOR.**

Jose Vega, Alexander Kazansky, PhD., Department of Health and Biomedical Sciences, The University of Texas Rio Grande Valley

**ABSTRACT**

Prostate cancer remains one of the most common and potentially lethal neoplastic manifestations among men. In many cases, malignant transformation can be directly linked to activation of the STAT family of transcription factors. STAT5B, a specific member of the STAT family, is intimately associated with prostate tumor progression. While the full form of STAT5B is thought to promote tumor progression, a naturally occurring truncated isoform acts as a tumor suppressor. We previously demonstrated that truncated STAT5 is generated by insertion of an alternatively spliced exon and results in the introduction of an early termination codon. In this report we demonstrate a new approach aimed at inhibition the expression of full-length STAT5B (a proto-oncogene) while simultaneously enhancing the expression of STAT5ΔB (a tumor suppressor). The presented work combines the actions of steric-blocking splice-switching oligonucleotides (SSOs) and a novel nanotechnology-based approach for targeted delivery of DNA to tumor cells. We were able to block alternative splicing of STATs mRNA applying conjugates of SSO with pH insertion peptide (pHLIP). Our data demonstrates the functional effect of the intron/exon proportional tuning toward anti-cancer activity. A common feature of most STATs is alternative splicing, which leads to generation of a dominant-negative isoform. STAT proteins are involved in wide variety of physiological processes including immune response and tumor progression. Ability to modulate their actions and specifically switch function from tumor activating to tumor suppressing would be highly beneficial in many areas of biomedical research. In conclusion we developed and confirmed a novel method to implement steric-blocking splice-switching oligonucleotides for targeted delivery towards the development of novel therapeutic strategies. Supported by NIH/NIGMS SC3GM087201.

**SESSION I, POSTER U-53****ISOLATION AND CHARACTERIZATION OF TR-DNA FROM URINE OF PATIENTS WITH GYNECOLOGICAL DISEASE**

Irma Domínguez-Vigil, MSc. 1; Gabriela Gómez-Macías, Lourdes Garza-Rodríguez, PhD1, PhD2, Hugo Barrera-Saldaña, PhD3. / 1 Biochemistry and Molecular Medicine Department, School of Medicine, Autonomous University of Nuevo Leon, México; 2 Department of Pathological Anatomy and Cytopathology, University Hospital 'Dr José Eleuterio González', Autonomous University of Nuevo León, Mexico; 3 Vitagenesis S.A. de C.V., México.

**ABSTRACT**

Introduction: At present, it is not always possible to diagnose most of the different types of cancers in a timely manner, especially gynecological cancers. Sometimes performing a biopsy is not easy to achieve, so, it is necessary to consider a new minimally invasive alternative, as urine. Objective: Isolation and characterization the cell free of urine (Tr-DNA) from patients with gynecological diseases. Methods: Tr-DNA was isolated from 4 ml urine of patients with gynecological diseases (n=21) confirmed by pathology, and were extracted with QIAamp Circulating Nucleic Acid Kit and eluted in 30 µL of AE Buffer, quantification in a fluorometer Qubit 3.0 with dsDNA HS Assay Kit, and analyzed in a capillary gel electrophoresis QIAxcel Advanced System with DNA High Resolution Kit. All patients signed Informed Consent approval by Ethical Committee local. Results: Average Tr-DNA yield of patients with endometrial cancer (n=10), ovarian cancer (n=4), and gynecological diseases (teratoma, cystadenoma, cyst and polyp) (n=7), were: 19.552, 10.571, and 4.078 ng per ml urine, respectively. The electrophoresis results indicated a fragmented patron of DNA and pronounced size of 100 pb. The statistics value (t student) between endometrial cancer and benign disease was p= 0.071. Conclusions: cell free DNA will be recuperated of urine (Tr-DNA) of patients with gynecological diaseses, in this work we did not find significant differences due to the small number of samples analyzed, however it is indicated the urine can be a non-invasive valuable tool in the diagnosis. Future directions: Larger sample are needed to evaluate the impact of such differences on downstream applications such as biomarker. Founding: This work was supported by the CONACYT's Great National Health Problems Grant (#247850).

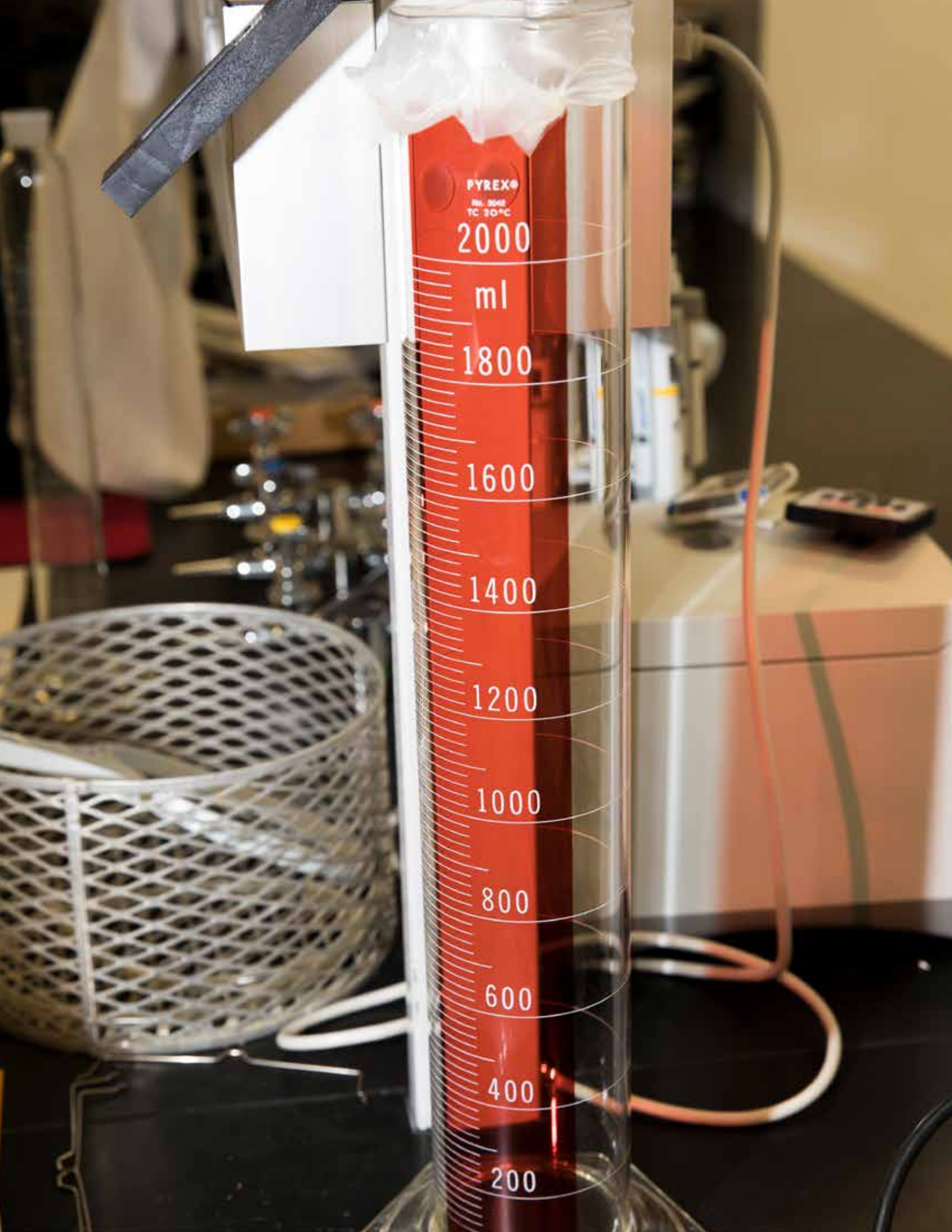
**SESSION I, POSTER U-54****AN ANALYSIS OF MEDICAL AND SOCIAL BARRIERS TO OPTIMAL DIABETES CARE IN A SOUTH TEXAS COMMUNITY HEALTH CENTER**

Vigneswaran L 1, Saldivar M PhD 1, Anandasivam L MD 2, Restrepo, B.I. PhD 3 1 Department of Biomedical Sciences, UTRGV 2 Brownsville Community Health Center (BCHC) 3 UTHHealth School of Public Health

**ABSTRACT**

Type 2 Diabetes mellitus (T2DM) is a top ten leading cause of morbidity & mortality in Texas and its complications account for 20% of hospitalized patients. Furthermore, the medical costs for managing these patients in the U.S has increased rapidly, with patients in the RGV generating costs of approximately \$9,480 per person annually. The BCHC provides primary health care to predominantly medically underserved Hispanic population living in the Valley, where one in three people is diagnosed with diabetes. The objective of this study is to identify the medical and social factors associated with poor glycemic control in T2DM patients. Adult T2DM patients (n=154) attending BCHC were invited to take part in completing a short Diabetes Self Management Questionnaire (DSMQ) about social barriers. The corresponding patients' clinical chart's data such as medications, blood glucose/HbA1c levels and diabetes related comorbidities are being collected. Data shows that the patients' mean BMI, glucose and HbA1c levels measured during the past 3-years were 31.41± 44.5, 131.9 ± 69.2 and 8.1 ± 1.9, respectively. In terms of correlation there seems to be a significant correlation (p ≤0.05) with poor glycemic control among our T2DM patients with their blood glucose levels and age; older patients had better glycemic control. Furthermore, glycemic control was significantly (p ≤0.05) poor among patients who were taking insulin compared to patients taking only Oral DA. In terms of the DMSQ, affordability of medications was the most significant social barrier to optimal glycemic control. Funding: Engaged Scholars Award.





# Graduate Student Category Poster Presentations

## SESSION I, POSTER G-1

### LDLR-RELATED PROTEIN 1 INCREASES CYTOKINE SENSITIVITY- IMPLICATIONS FOR RECOVERY AFTER BRAIN DAMAGE

Sadiya Ahmad<sup>1</sup>; Pamela Reed<sup>1</sup>; Shane Sprague<sup>1</sup>; Naomi Sayre, PhD<sup>1</sup>. <sup>1</sup> University of Texas Health Center San Antonio, Texas

#### ABSTRACT

Patients that express the Apolipoprotein E4 (ApoE4) are predisposed to poor long-term outcome after stroke. Explanations for this increased risk are not yet elucidated. This study aims to test one possible mechanism by which ApoE4 contributes to cognitive decline after stroke by examining the effect of a major ApoE4 receptor, low-density lipoprotein receptor related protein 1 (LRP1), on sensitivity to stress in astrocytes. LRP1 binds and moves extracellular ligands and plasma membrane proteins into the endocytic system. LRP1 was found to regulate cell-surface TNF receptor (TNFR1), although this has not been shown in astrocytes. We propose that a similar mechanism occurs in the central nervous system to attenuate inflammatory response after stroke. Studies have shown that ApoE4 slows the recycling of endocytic LDL receptors. We hypothesize that ApoE4 inhibits the ability of LRP1 to remove TNFR1 from the plasma membrane. This is expected to increase cytokine sensitivity, resulting in worse outcome after stroke. We investigated the effect of LRP1 on TNF $\alpha$  signaling and response in immortalized ApoE null mouse astrocytes subjected to lentiviral-mediated knockdown of LRP1. The astrocyte response to TNF $\alpha$  stimulation was tested in a concentration and time dependent manner using Western blotting of NF $\kappa$ B, a downstream mediator of TNF $\alpha$  signaling. We also tested astrocyte viability after prolonged TNF $\alpha$  stimulation. We found that LRP1 deficient cells have increased phosphorylation of NF $\kappa$ B upon TNF $\alpha$  stimulation, and resulted in significant loss of viability. Our results indicate that loss of LRP1 renders astrocytes more sensitive to TNF $\alpha$ . Future experiments will focus on treating astrocytes ApoE4 to determine if detrimental effects are exerted through LRP1. This work is supported by the American Heart Association.

## SESSION I, POSTER G-2

### SELF-STABILIZATION HOLDER: INCREASING THE QUALITY OF LIFE FOR PARKINSON AND ESSENTIAL TREMOR PATIENTS

Rodolfo Becerra, BSME<sup>1</sup>, Misael Martinez, BSME<sup>1</sup>, Carlos Hernandez, BSME<sup>1</sup>, Arnoldo Ventura<sup>1</sup>, Karen Lozano, PhD<sup>1</sup> <sup>1</sup> University of Texas Rio Grande Valley, Edinburg, TX;

#### ABSTRACT

Unintentional muscle movements are being considered in this project. Trembling caused by conditions such as Parkinson's disease (PD) and Essential Tremor (ET) can lead to a difficult life. Although similar, they result in distinctive tremor signs and symptoms. In both instances, the hands are most likely to be affected from tremors over any other body part. This results in the inability to manage fine, distinct motor skills, such as writing. Even though methods for controlling and alleviating the symptoms exist, the risks and expenses are far too great to make them a desirable option. An alternative approach is a self-stabilizing mechanism that cancels the tremors being transmitted from the hand to the utensil being held, such as a pen. When the hand is placed in the base, the accelerometer will measure the frequency and amplitude of the hand tremors and the data is then sent to the micro-controller. The controller then filters the data to distinguish between voluntary and involuntary motion. After analyzing, it sends an appropriate command to the motors to counteract the vibration. A prototype is manufactured for experimental testing. Vibration analysis, such as root-mean-square (RMS) reduction and frequency spectrum, will be applied for the evaluation of the design.

## SESSION I, POSTER G-3

### OBESITY AND MUSCULOSKELETAL ALTERATIONS IN PATIENTS FROM REYNOSA, TAMAULIPAS, MÉXICO

Laura K. Bocado-Carballo, BSc<sup>1</sup>, Isabel A. Cabrera-Villarreal, BSc<sup>1</sup>, Luis F. González-Alatorre, MD<sup>2</sup>, Netzahualcoyotl Mayek-Pérez, DrSci<sup>1</sup> <sup>1</sup> Universidad México Americana del Norte AC, Reynosa, Tamaulipas, México; <sup>2</sup> Hospital General de Reynosa 'Dr. José Ma. Cantú Garza', Reynosa, Tamaulipas, México.

#### ABSTRACT

Obesity is a major epidemic in both developed and developing countries. Obesity is a multifactorial disease and can provoke disability and other chronic diseases such as cardiovascular disease, hypertension, diabetes and some types of cancer that reduce life quality. In this work, we determined the effects of obesity on the incidence of musculoskeletal alterations in adult patients from Reynosa, Tamaulipas, México. Fifty patients were included in this work (23 male, 27 female). Age of patients ranged from 30 to 78 years-old. All patients showed any degree of obesity and most of them were from Reynosa, Tamaulipas, married, and dedicated to household-work. Body-mass index (BMI) were estimated and then patients classified by obesity degree. Incidence of low back pain, ankle arthrosis, osteoporosis, disc herniation, coccyx arthrosis and gonarthrosis was registered. Low back pain, gonarthrosis and disc herniation were the most common musculoskeletal alterations detected in obese patients from Reynosa. BMI and obesity degree were positively correlated with all musculoskeletal alterations with exception of ankle arthrosis and osteoporosis. Physical inactivity and high body-mass indexes are closely associated with an increased risk of chronic pain due musculoskeletal alterations and fracture risk in general adult-obese population. As the obesity epidemic grows, newer studies will be needed to help us fully understand the true impact of obesity on the musculoskeletal system of obese patients, and to generate strategies for pain management, physical therapy, standard care and/or rehabilitation, among others.

#### SESSION I, POSTER G-4

##### DEVELOPMENT OF A NOVEL PCR-BASED METHOD FOR DETECTION AND DIFFERENTIATION OF MYCOBACTERIUM TUBERCULOSIS COMPLEX FROM NON-TUBERCULOUS MYCOBACTERIA

Chairez-Cantú, SK1, Aguirre-Treviño, D1, Sánchez-Ibarra, HE1, López-Tavera E1, Ramírez-Sánchez, AD1, Rendón-Pérez LA2 and Barrera-Saldaña, HA1 1Laboratory of Bioprocesses, Vitagenesis S.A. de C.V., Monterrey, Nuevo León, Mexico 2Centro de Investigación, Prevención y Tratamiento de Infecciones Respiratorias, Hospital Universitario, Universidad Autónoma de Nuevo León.

##### ABSTRACT

In 2015, 10.4 million people fell ill with tuberculosis (TB) and 1.8 million died from the disease where 95% of the deaths occurred in low and middle-income countries and the risk increases when the affected population is immunocompromised. Mycobacterium is classified in two different groups: M. tuberculosis complex (MTBC), which consists on Mycobacterium species that can cause, TB, and non-tuberculous mycobacteria (NTM) which are responsible for developing opportunistic infections in humans. The traditional MTBC and NTM detection methods do not differentiate between Mycobacterium species, therefore a TB treatment will take place whether it is a TB or NTM infection, causing an inadequate choice of medication for NTM infected patients, since NTM species are commonly resistant to anti-tuberculosis drugs. In this study, a simple and cost-effective method was developed in order to detect a mycobacterial infection based on the conserved regions of the 16S gene differentiating between MTBC and NTM through PCR-targeting the IS6110 insertion sequence in MTBC. The specific primers designed for targeting this sequence were used in a multiplex PCR and Sanger sequencing was subsequently performed in order to identify the infecting microorganism involved. This rapid diagnosis will allow personalized treatments for MTBC and NTM infected patients. This project was funded by CONACYT research grant number 260826.

#### SESSION I, POSTER G-5

##### A HIGH DENSITY MICRO-ELECTROCORTICOGRAPHY DEVICE FOR A RODENT MODEL

Mukhesh K. Koripalli1, Joshua Acosta1, Yoontae Kim2, Moses Noh, PhD2, Yoonsu Choi, PhD1 1Department of Electrical Engineering, The University of Texas Rio Grande Valley, McAllen, TX 2Department of Mechanical Engineering and Mechanics, Drexel University, Philadelphia, PA

In the research of neuroscience, micro-electrocorticography ( $\mu$ ECoG) electrode arrays are a common tool in the study of cortical functions. The use of  $\mu$ ECoG electrodes as means of recording has the advantages of design customization, material flexibility, minimal invasiveness, and low cost. The brain is anatomically and functionally organized into separated regions, however several studies support the notion that brain regions interact with one another during information processing. Thus, one significant goal in neuroscience research is to determine the mechanisms that are responsible for neuronal interaction between several neuronal populations.  $\mu$ ECoG is a methodology for stable mapping of the brain surface using local field potentials (LFPs) with a wide cortical region, high signal fidelity, and minimal invasiveness to brain tissue. To compare surface  $\mu$ ECoG signals with inter-cortical neuronal activity, we fabricated a flexible handcrafted  $\mu$ ECoG electrode made with economically available materials. This handcrafted  $\mu$ ECoG electrode is non-penetrative with 256 channels that cover an area of 7mm X 7mm on the cortical surface of a Lewis rat. This device was placed on the motor and somatosensory cortex of the brain to record signals of an active animal. The recordings are acquired by using the Synapse Software and the Tucker-Davis Technologies acquisition system to monitor and analyze electrophysiological signals within the amplitude range of 200 $\mu$ V for local field potentials. This demonstrates how reactive channels and their spatiotemporal and frequency-specific characteristics can be identified by means of this method.

#### SESSION I, POSTER G-6

##### SEARCH GENETIC VARIANTS IN BRCA GENES OF OVARIAN CANCER PATIENTS: A NEW CHALLENGE FOR PRECISION MEDICINE IN MEXICO.

Jesus Rolando Delgado-Balderas, MSc1, Maria Lourdes Garza-Rodriguez, PhD1, Gabriela Sofia Gomez Macias, MD2, Oralia Barbosa-Quintana, PhD,2, Alvaro Barbosa Quintana, MD3, Ivett Miranda-Maldonado, MD4, Hugo Vazquez-Garcia, MD5, Lezmes Valdez-Chapa, MD6, Mauro Antonio-Maced, MD6, Michael Dean, PhD7, Hugo Barrera-Saldaña, PhD1\*. Biochemistry and Molecular Medicine Department, Medical School, Universidad Autonoma de Nuevo Leon, Mexico. 2. Pathology Department, University Hospital, Mexico. 3. Pathology Department, San Jose Tec de Monterrey Hospital. 4. Pathology Department, Oca Hospital, Mexico. 5. Obstetrics and Gynecology Department, Christus Muguerza Hospital, Mexico. 6. Gynecology and Obstetrics Department, University Hospital, Mexico. 7. Michael Dean, Laboratory of Translational Genomics, DCEG, National Cancer Institute, Bethesda, MD, United States. Corresponding author, habarrera@gmail.com

##### ABSTRACT

Background. Ovarian cancer is the most lethal gynecological malignancy around the world. Precision medicine makes use of genetic profiles to give a targeted therapy appropriate. Our aim was to describe the genetic variants in BRCA1 and BRCA2 to determine women candidates for olaparib therapy. Methods. The study was approved by Research Ethics Committee under number BI13-005. We sequenced BRCA1 and BRCA2 genes in 50 samples from tumor tissue biopsies from ovarian cancer patients from Northeast Mexico; The sequencing was done using the Ion Torrent platform. Results: We found genetic variants in 48 samples. For BRCA1, we found 76 polymorphic and variants were found in BRCA1, of these polymorphisms, 5/76 (6.6%) were classified as pathogenic. 105 polymorphic variants were found in BRCA2, of which 63(60%) had not been reported previously. Of these polymorphisms, 5/76 (6.6%) were classified as pathogenic in BRCA1 and 5/105 (4.8%) in BRCA2. Conclusion: We illustrate that genotyping BRCA genes can help to identify patients that carry defects in DNA repair pathway and classify them like as candidates for olaparib therapy.

#### SESSION I, POSTER G-7

##### BIOBANK OF PROSTATE CANCER TISSUES: A NEW ERA IN PRECISION MEDICINE.

Jesus Rolando Delgado-Balderas, MSc1, Lauro Salvador Gomez-Guerra, PhD, MD2, Jose Ivan Robles-Torres, MD2, Raquel Garza-Guajardo, PhD, MD3, David Hernandez-Barajas4, Herminia Martinez-Rodriguez1, Maria Lourdes Garza-Rodriguez, PhD1, Celia Sanchez-Dominguez, PhD\*1. 1. Biochemistry and Molecular Medicine Department, Medical School, Universidad Autonoma de Nuevo Leon, Mexico. 2. Urology Department, University Hospital, Mexico. 3. Pathology Department, University Hospital, Mexico. 4. University Cancer Center, Universidad Autonoma de Nuevo Leon, Mexico.

##### ABSTRACT

A biobank is an organized collection of material biological information and its associated information, stored for research purposes. In our country, prostate cancer (PC) is the first death cause for cancer in men. The diagnostic and monitoring tools are deficient, so development of new tools for this purpose is mandatory. The goal of this work was to generate a biobank for the discovery of new biomarkers in PC. Methods. The research protocol was approved for Ethical Research Committee (no. UR16-007). This work consists in retrospective and prospective phases. We collected tumor samples from prostatic biopsy and blood. nucleic acids extraction was performed from tumor samples and separate peripheral blood sample in plasma and polymorphonuclear cells. On the other hand, we are building a clinical database. Results. Retrospective phase includes today 20 tumor samples with its clinical characteristics. We apply a quality control like ratio 260nm/280 nm > 1.8 and amplification of TNF $\alpha$  gene to demonstrate the feasibility for molecular analyzes like Next Generation Sequencing or Digital PCR. The same case occurs with genomic DNA obtained from peripheral blood. An interesting point is that plasma will be used in near future for to discover circulating biomarkers.

#### SESSION I, POSTER G-8

##### THE DESIGN OF AN X-APTAMER AGAINST SNAKE VENOM DISINTEGRINS

Ilse Diego1&2, Montamas Suntravat, PhD1, Sara E. Lucena, PhD1, Curtis Lam PhD 3, Nancy Ward3, Mark Shumbera PhD 3, David Gorenstein PhD 3, and Elda E. Sánchez, PhD1&2 1 National Natural Toxins Research Center (NNTRC), Texas A&M University-Kingsville, Kingsville, TX 78363; 2 Department of Chemistry, Texas A&M University-Kingsville, Kingsville, TX 78363, 3 AM Biotechnologies, LLC, Houston, TX 77030, USA;

##### ABSTRACT

The use of aptamers rather than antibody-based antitoxins can result in the development of a new venom antidote, useable under severe conditions and suitable for immediate administration in the field without risk of serious side effects. Envenomation by the family Viperidae is characterized by hemorrhage, local necrosis, edema, and systemic effects such as coagulopathy, nephrotoxicity, neurotoxicity, and cardiotoxicity. Snake venom metalloproteinases (SVMPs) and disintegrins are the important factors responsible for hemorrhage and interfere the hemostasis pathway. Metalloproteinases from snake venoms are classified into three major classes (P-I to P-III) based on their structural domains. The disintegrin domain is a part of the P-II and P-III SVMPs, which have been reported to possess more diverse biological activities than the P-I class of SVMPs. The aim of this project is to design an X-aptamer against a disintegrin from the venom of Crotalus atrox and determine its neutralizing abilities on both disintegrins and SVMPs. Disintegrins were purified by reversed-phase and cation exchange HPLC columns. Fractions 6-9 showed protein bands at about 8 kDa, which were identified as disintegrins using SDS-PAGE and N-terminal sequencing. Disintegrins will be further biotinylated in vitro for the X-aptamer selection. X-aptamers can open new avenues in identifying novel cellular targets of venom toxins providing the foundation for designing innovative therapeutics for the treatment of various illnesses. Funding for this project was provided by the NIH-NCRR/BMRG, Viper Resource Grant # P40OD01960.

#### SESSION I, POSTER G-9

##### CHARACTERIZATION AND ANTIBIOTIC SUSCEPTIBILITY PATTERN OF COMMUNITY ISOLATED STENOTROPHOMONAS SPECIES

Elufisan Temidayo Oluyomi1, Rodrigue Luna Isabel Christina 1, Omotayo Opemipo Oyedara1,2 Alejandro, Valera Sachez1 Miguel Angel Villalobos1 and Xianwu Guo1 1Instituto Politécnico Nacional, Centro de Biotecnología Genómica, Reynosa, Tamaulipas 88710, 2Department of Biological Sciences, College of Science, Engineering and Technology, Faculty of Basic and Applied Science, Osun State University, Osogbo, Osun State, Nigeria

##### ABSTRACT

The ability of Stenotrophomonas spp., (some of which could be involved in human infection), to quickly adapt to environmental changes has resulted in the advent of various clonal diversity. New features either phenotypic or genotypic such as new antibiotic resistant pattern and new metabolic behavior may be found in them. In this study, Stenotrophomonas samples were collected from soils and sewage in different parts of Mexico and 43 Stenotrophomonas strains were isolated. They belong to three different species (S maltophilia, S. nitritireducen and Stenotrophomonas spp) based on the BLAST search analysis of the sequenced 16S rDNA nucleotide sequence, which were produced by PCR with our Stenotrophomonas-specific primers. Stenotrophomonas maltophilia isolates from sewage showed the ability to use arabinose and mannitol as sole carbon source and grew at 42°C, different from Bergey's manual report. Stenotrophomonas strains were resistant to most antibiotic tested except fluoroquinolones, including ofloxacin (2.32%), ciprofloxacin (6.98%), and pefloxacin (9.3%) with average multi-resistance index being 70%. Most isolates were resistant to sulfamethazole-trimethoprim (81.4%). This result suggests the need for drug review in the treatment of Stenotrophomonas associated infections and the need for empirical drug administration for the treatment of Stenotrophomonas-associated infections in Mexico. This is the first study in Mexico which focused on the resistant pattern of non-hospital strains of Stenotrophomonas species, and the second to evaluate the susceptibility pattern of S. maltophilia in Mexico.



**SESSION I, POSTER G-10****THE PREVALENCE OF SUBCLAVIAN ARTERY STENOSIS IN MEXICAN AMERICANS:****RESULTS FROM THE CAMERON COUNTY HISPANIC COHORT**

*Nelson D. Gonzalez, MPH1, Marlene Garcia, MD2, Kristina P. Vatcheva, PhD1, Audrey Choh, PhD1, Gordon Watt, PhD1, Susan T. Laing, MD3, Joseph B. McCormick, MD1, Susan Fisher-Hoch, MD1, Anand Prasad, MD2*  
*1 UTHealth School of Public Health - Brownsville Campus; 2 The UT Health Science Center (UTHSC) at San Antonio; 3 The UTHSC at Houston*

**ABSTRACT**

There are limited data on the prevalence of subclavian artery stenosis (SAS) in community cohorts. Inter-arm systolic blood pressure (BP) readings have been used to screen for SAS. The aim of this study was to assess the prevalence of SAS in a random sample of Mexican American (MA) adults. Methods: The Cameron County Hispanic Cohort Study is a representative sample of the MA population in Cameron County, Texas. Participants from the sample had their bilateral arm systolic BP readings taken using an automatic BP device (Welch Allyn, Skaneateles Falls, NY). Results: The sample consisted of 383 participants; 35% male. The rates of past smokers, chronic kidney disease (eGFR < 60 ml/min), and obesity were 36%, 5.2%, and 52%, respectively. The rates of diabetes mellitus and hypertension were 34.0% and 39.3%, respectively. The overall study prevalence of SAS using the ≥15 mm Hg definition was 9.7%. The systolic inter-arm pressure differences are summarized in the figure.

**SESSION I, POSTER G-11****DESIGN AND DEVELOPMENT OF AN INDEPENDENTLY OPERATED ESTHETIC LIFTING****DEVICE FOR PHYSICALLY DISABLED PEOPLE**

*Noe Vargas Hernandez, PhD, Jorge L. Gutierrez Garrido, MA, The Department of Manufacturing Engineering, Mechanical Engineering, The University of Texas Rio Grande Valley*

**ABSTRACT**

The present investigation is about a self-operated fall aid device. The main objective of this investigation was the development of a fall aid device with the functionality of being operated by the affected person without the need for external help. The secondary objective was to achieve a simple design with a low cost and capable of hiding in plain sight. The developed fall aid device provides a physically impaired person the ease of achieving a seated position after falling to the floor. The device is easily operated by solely the affected person. The apparatus includes a rigid frame divided into three sections to adapt to the human body in a seated position after the device has transformed. This structure provides a solid support to maintain the person seated. The lifting device includes a pump to inflate a set of inflatable chambers. This set of chambers is located below the middle section of the frame that act as the lifting mechanism of the apparatus. As previously mentioned, one of the main features of the device is its simple design and ability to be hidden in plain sight. This was done by disguising it as a rug that can be placed anywhere in a room. The method used to develop this investigation was the observation of similar product to achieve the objective of helping a disabled person to be lifted from the ground.

**SESSION I, POSTER G-12****DIALECTICAL BEHAVIOR THERAPY: EFFECTIVENESS OF CULTURAL ADAPTATION WITH A LATINA ADULT DIAGNOSED WITH AN EATING DISORDER AND DEPRESSION**

*Yvette Hinojosa, BS1, Alfonso Mercado, PhD1* *1 University of Texas Rio Grande Valley, Department of Psychological Science, Edinburg, Texas*

**ABSTRACT**

Dialectical Behavior Therapy (DBT) has become the treatment of choice for complex clinical disorders and its effectiveness is well-documented. However, there is a lack of evidence supporting this approach with culturally diverse groups. Objective: This case study highlights the applicability and effectiveness of a Spanish DBT skills program with a 23-year-old Latina female diagnosed with Bulimia Nervosa and Dysthymic Disorder at a community mental health program. Method: This case study incorporates case history, pre and posttest measures (PAI, BDI, BAI, BHS, and BSS), and the client's monitored progress during a 17 week Spanish DBT group skills program. Findings: The results indicate that DBT skills, when delivered in a culturally responsive manner, had a significant impact in reducing client symptomology and improving interpersonal effectiveness. Conclusions and Implications for Practice: The generalizations that can be made based on this study is unknown. We intend to increase the power of this longitudinal study and hope to obtain a Treatment as Usual control group in the future. The findings support the conclusion that cultural adaptations of empirically supported treatments in a community mental health setting and the importance of providing supplemental and culturally sensitive interventions to an existing outpatient mental treatment program enhances treatment efficacy. Clinical implications and recommendations for clinicians and psychology trainees are offered.

**SESSION I, POSTER G-13****REFINEMENT OF REAL-TIME NANOSCALE OPTICAL MICROGRAPHS THROUGH OPTIMIZATION OF AN ADAPTIVE ALGORITHM**

*Michael Izaguirre, Juan Guevara Jr., PhD, and Natalia Guevara, PhD\** *Biophysics Research Laboratory, Department of Physics, The University of Texas Rio Grande Valley \*Director of the Biophysics Research Laboratory*

**ABSTRACT**

Bioimage informatics is a growing subfield of computational biology as well as bioinformatics. With the advancement of photo-sensors, microscopy methods, and an assortment of technologies, it becomes crucial to be able to revisit early algorithms and processes that can be coupled with these modern technologies and their micrographs that contain tremendous amounts of data. Our aim was to optimize an older algorithm for the refinement of live cell, non-invasive optical micrographs obtained in the biophysics research lab. The diffraction limitations in optical microscopy call for various factors to be considered when visualizing the data retrieved from the photo-sensor. Well-known physical limitations in optical microscopy are often the root of hazy and blurry micrographs when dealing with specimen below the 200-nm limitation. The micrographs collected in our lab are obtained in real time, roughly 30 milliseconds apart, and contain an assortment of datasets and values. With proper utilization and optimization of an adaptive histogram equalization algorithm implemented through ImageJ, we can view nanoscale activity and differentiate between structures. Frame by frame analysis of chromatin activity in live cell nucleus micrographs and pixel size calibration allows us to report the ability to differentiate structures at the systems resolution limit of 45 nm. This methodology grants the ability to view real-time protein-protein interactions and conformational changes on the nanoscale to observe a variety of biological processes in an unaltered, natural state. Future work consists of further optimization of this algorithm and others of the like while keeping them as automated unbiased systematic approaches for enhancing high-resolution optical micrographs. The end goal is to present a simplistic approach and easy to use method for a microscopy system that has many clinical and scientific applications.

Studies are supported in part by grants F49620-99-1-0327 (AFOSR, PI – J. Guevara) and SC2GM081218 and SC3GM099637 (NIH, PI – N. Guevara)

**SESSION I, POSTER G-14****BIOBANK: A PRODUCT OF BIO AND HEALTH INDUSTRIES AND KEY ELEMENT FOR FUTURE RESEARCH**

*Luna-Aguirre CM1, Ramírez-Gordillo S1, López-Tavera E1, Moreno-Martínez AK1, Sánchez-Ibarra HE1, Palacios-Tovar TE1, Garza-Rodríguez ZB1, Mendiola-Garza G1, Barrera-Saldaña HA1.* *1Genomic Bioanalysis Laboratory, Vitagénesis SA de CV, Monterrey, N.L. México.*

**ABSTRACT**

One of the main resources for biomedical science are the biobanks, which allow the development of biomarker detection, molecular diagnosis, translational medicine and multidisciplinary disease research. This is in turn enriched by the establishment of collaboration networks between research institutions, which enhances the standardization and diffusion of processes, policies and computational infrastructure. Furthermore, it helps to broaden the scope of the projects and services supported by the participating institutions, for instance, by backing the technological validation. The objective of this project is to establish a biobank out of the materials derived from the research projects and services carried out by Vitagénesis SA de CV, complying with the international quality norm ISO 9001:2015. Results: Vitagénesis SA de CV holds collections of samples coming from several research projects that were approved by CONACyT (tissues and/or blood from patients with metastatic colorectal cancer, diabetes and lung cancer), as well as from the services offered to the Bio-industry (several cultured microorganisms and extracted nucleic acids). Some of these collections have been used for the implementation and validation of new technologies as part of national (AMGEN) and international (Biocartis) collaborations. Conclusion: The appropriate storage of many kinds of samples can serve as a source of biological materials for a great variety of multidisciplinary research projects, as well as for the implementation of state-of-the-art technologies. Funding source: AMGEN and CONACYT grant 260826, 218098.

**SESSION I, POSTER G-15****RATTLESNAKE (CROTALUS OREGANUS HELLERI): THEIR ROLE ON BLOOD AND LYMPHATIC ENDOTHELIAL CELL PERMEABILITY**

*Jessenia Marquez1; Victoria Parra1; Walter Cromer2; David Zawieja2, Montamas Suntravat1; Elda E. Sánchez1&3* *1 National Natural Toxins Research Center (NNTRC), Texas A&M University-Kingsville, Kingsville, TX, USA; 2 Division of Lymphatic Biology, Texas A&M College of Medicine, Bryan, TX, USA; 3 Department of Chemistry, Texas A&M University-Kingsville, Kingsville, TX, USA*

**ABSTRACT**

Cysteine-rich Secretory Proteins (CRiSPs) have long been recognized as ubiquitous components of many snake venoms; however, no concrete role has been assigned. We speculate that CRiSPs disrupt normal interstitial fluid dynamics adjacent to the snakebite, accelerating the transfer of the macromolecular toxins in the venom into the lymphatic circulation, which plays a critical role in venom absorption and distribution into the systemic circulation. The rapid delivery of these toxins into the circulation contributes to the acute effects of envenomation. The goal of our study is to characterize the cellular and molecular basis for the effects of Hellerin, a newly identified CRiSP isolated from the venom of the Southern Pacific rattlesnake, on the function of human dermal blood and lymphatic endothelial cells. Crude venom was characterized by reversed-phase HPLC fractionation, followed by analysis of chromatographic fractions by SDS-PAGE and N-terminal sequencing. The N-terminal sequence of a 28 kDa protein band in fraction 17 was determined and identified as a CRiSP family. CRiSPs will be further purified by cation exchange column and test their roles on human dermal blood and lymphatic endothelial cell permeability. Knowledge gained from these studies will contribute to a new level of understanding of the pathophysiology of snakebite. Funding for this project was provided by the NIH/NHLBI Grant# 1R15HL137134-01 and Viper Resource Grant# P40OD01960.

#### SESSION I, POSTER G-16

##### **BLOCKADE OF THE COLONY STIMULATING FACTOR-1 RECEPTOR REVERSES BONE LOSS IN MOUSE MODEL OF SECONDARY OSTEOPOROSIS.**

*Arisai Martínez Martínez, Department of Pharmacology, Autonomous University of Tamaulipas*

##### **ABSTRACT**

Mice lacking of either CSF-1 or CSF-1R display osteopetrosis and pharmacological blockade of CSF-1/CSF-1R pathway prevents the bone loss associated to cancer and arthritis. However, the role of the CSF-1/CSF-1R pathway in the development of osteoporosis has not been examined. Thus, it was evaluated the anti-resorptive effect of antibody against CSF-1R in adult female ICR mice with type 1 diabetes mellitus (T1DM, model of secondary osteoporosis-induced bone loss) by using microcomputed tomography. Female ICR mice at 10 week-old received 5 daily administrations of streptozotocin (i.p. 50 mg/kg). Fourteen weeks after first injection of STZ, mice received an anti-CSF-1R (2G2) antibody (10 mg/kg, i.p; once/week per 6 weeks) or vehicle. At the day of last administration of the antibody, mice were sacrificed and femur and lumbar vertebra were harvested for microCT analysis. Streptozotocin-induced T1DM resulted in significant trabecular bone loss at the femoral neck, L5 vertebra as well as a significant decrease in the cortical bone of the femoral mid-diaphysis. Chronic treatment with anti-CSF-1R antibody significantly reversed the bone loss observed in mice with T1DM. Our results suggest that blockade of CSF-1R reverses the bone loss in model of secondary osteoporosis.

#### SESSION I, POSTER G-17

##### **ASSOCIATION AMONG PHYSICAL ACTIVITY, RESTING BLOOD PRESSURE, HIP AND WAIST CIRCUMFERENCE, AND BODY COMPOSITION IN HISPANIC COLLEGE STUDENTS**

*Paloma Mendoza, Phillippe Lopez, Archie Massen, Magalie Sanchez, Raymundo Chapa, Ulku Karabulut UTRGV Health and Human Performance Department*

##### **ABSTRACT**

The purpose of this study was to examine the correlation among physical activity (PA), resting blood pressure (PB), hip (HC) and waist circumference (WC), and body composition (BC) among Hispanic college students. METHODS: Fifty-one (51) Hispanic undergraduate students (age= 22.8 ± 3.7), (24 males and 27 females), volunteered to participate in the study. Each subject read and signed the consent form, prior to any measurement. Physical activity was predicted via Godin's Leisure-Time Exercise Questionnaire. Resting blood pressure, hip, and waist circumference were measured in the Exercise Physiology lab using the ACSM guidelines. Body composition (BC) was measured via Tanita RESULTS: It was found that PA was negatively correlated with hip circumference (-0.430\*\*), diastolic blood pressure (-0.298\*), and body composition (-0.530\*\*). CONCLUSION: The results indicate that PA matters for resting blood pressure and body composition in young Hispanic students. Future studies should be performed to determine objectively measured physical activity and focus on sedentary bouts. Possible physical activity intervention methods should also be investigated.

#### SESSION I, POSTER G-18

##### **THE NEUTRALIZATION EFFICACY OF EXPIRED POLYVALENT ANTIVENOMS: AN ALTERNATIVE OPTION**

*Chesney E. Migl1, Montamas Suntravat1, Elda E. Sánchez 1&2 1National Natural Toxins Research Center, Texas A&M University-Kingsville, Kingsville, TX; 2Department of Chemistry, Texas A&M University-Kingsville, MSC 161, Kingsville, TX*

##### **ABSTRACT**

The expense of production and distribution of antivenom, as well as relatively infrequent use compared to other medications, is causing antivenom against snakebite to be increasingly difficult to obtain, resulting in a global shortage. Unused, expired antivenom represents a potentially large untapped resource to alleviate this problem. This study examines the efficacy of expired antivenom over time by testing clotting statistics in vitro. Representatives from three years for four different brands of polyvalent antivenom were chosen and tested against their corresponding venoms as well as other venoms that could display cross reactivities. These were: Wyeth (U.S.; 1997, 2001, 2003), Antivipmyn (Mexico; 2005, 2013, 2017), Biotecfar (Venezuela; 2010, 2014, 2016), and SAIMR (South Africa; 1997, 2005, 2017). Wyeth was tested against *Crotalus atrox*, Antivipmyn and Biotecfar against *C. atrox* and *C. durissus vegrandis*, and SAIMR against mg/ml *Echis carinatus*. For each treatment whole blood was measured for activated clotting time (ACT), clotting rate (CR), and platelet function (PF). Preliminary results with each antivenom brand appear encouraging; the antivenoms maintain efficacy levels over the various time spans. In light of the global shortage of antivenoms, this information will provide hope in the cases of snakebite emergencies. Funding for this project was provided by Viper Resource Grant# P40OD01960.

#### SESSION I, POSTER G-19

##### **MOTIFS IN DENGUE NS1 PROTEINS IMPLY CAPACITY TO INTERACT WITH HOST IMMUNE RESPONSE SIGNALING PATHWAYS**

*Christian Miranda, Juan Guevara Jr., Ph.D, Natalia V. Guevara, Ph.D., Department of Physics, The University of Texas Rio Grande Valley, The Biophysics Research Laboratory*

##### **ABSTRACT**

Dengue nonstructural protein, NS1, is located between residues 0777 to 1130 of the virus polyproteins. This region has been shown to be essential in viral propagation, and displays molecular pattern with signal transduction potential. Host immune response pathways represent a likely target for pathogen-associated signaling, yet motifs that would impart NS1 with the capacity to mediate the host immune response have not been identified. Our examination of the primary structure of NS1 revealed a commonality with Interferon Regulatory Proteins, IRFs. These proteins are comprised of a 110-residue DNA binding domain followed by a Transactivation domain; functional motifs for each domain are, also, well known. Sequence of IRF DNA-binding domains is highly conserved; 5 and 6 Tryptophan residues form intra-molecular, hydrophobic clusters, a Nuclear Localization Signal motif at the N-terminus, a Pro-Gly motif, and a cation-binding site at the carboxyl end. IRF Trans-activation domains are involved in numerous immune response pathways. The sequence spanning residues 0790 to 0895 of the dengue polyprotein, within the NS1 region, shares several motifs that are present in the IRF DNA binding domains, e.g. WEN in IRFs 4 and 8 is in DNV 3. The motif GXXG present in dengue NS1 suggests both DNA and RNA binding capacity. The sequence 0931EDYGFGIF0938 is conserved in DNV1 NS1 and may be a potential Tyrosine Kinase phosphorylation site. Moreover, this motif appears in the IRF 5 Transactivation domain as EDYSFGAG. We propose that dengue NS1 region plays a role similar to that of IRF proteins and may interfere and/or mediate host immune response signaling pathways.

#### SESSION I, POSTER G-20

##### **HOLIDAYS EFFECT ON WEIGHT GAIN OF UNIVERSITY STUDENTS. STUDY FOR PROOF OF CONCEPT.**

*Claudia Munguía1, Carlos Ramirez Pfeiffer1, Srinivas Mummidi2, Ravindranath Duggirala2, Juan Carlos Lopez Alvarenga1,2. 1. Investigación UMAN, Reynosa, Tamaulipas. 2. STDOI de UTRGV, Texas.*

##### **ABSTRACT**

Vacation days as risk for weight increase has been study in different countries. These reports show people whom increase weight often returns to basal weight. However, other studies reports basal weight is a good predictor to non-return of weight increase. None has considered the size of effect of weight gain over cardiovascular risk, neither the interaction of leptin increase (surrogate of energy expenditure). Neither has considered the effect of alcohol drinking or self-efficacy as modifiers of the weight. To evaluate these questions we will recruit 50 students with normal weight (BMI 20 to 25), compared to 50 with obesity (BMI 30 to 40), all will be followed during two periods of holidays in Mexico: the long-term vacation of Guadalupe-Reyes which starts in middle December and finish on January 6th and Holly Weak (Eastern). This first approach includes anthropometry measurements for BMI, body fat, and fat free mass, which will be recorder during 6 visits. Questionnaires for self-efficacy, alcohol drinking, and anxiety/depression (HAD) for 4 times, and leptin measurement two times. ANOVA for repeated measurements for anthropometry and biochemistry, with fixed factors (initial category of BMI groups, sex, living in same city of the University), and covariates will include self-efficacy, alcohol, HAD score and leptin will be performed. We considered two models based on Monte Carlo Simulation: 1) total measurements to contrast groups, 2) used the basal state as covariate to analyze the effect of weight. The sample size considered size effects greater than 40% and statistical power of 80%.

#### SESSION I, POSTER G-21

##### **CHARACTERIZATION AND ANTIBIOTIC SUSCEPTIBILITY PATTERN OF COMMUNITY ISOLATED STENOTROPHOMONAS SPECIES**

*Elufisan Temidayo Oluyomi1, Rodrigue Luna Isabel Christina 1, Omotayo Opemipo Oyedara1,2 Alejandro, Valera Sacher1 Miguel Angel Villalobos1 and Xianwu Guo1 1Instituto Politécnico Nacional, Centro de Biotecnología Genómica, Reynosa, Tamaulipas 88710, 2Department of Biological Sciences, College of Science, Engineering and Technology, Faculty of Basic and Applied Science, Osun State University, Osogbo, Osun State, Nigeria*

The ability of *Stenotrophomonas* spp., (some of which could be involved in human infection), to quickly adapt to environmental changes has resulted in the advent of various clonal diversity. New features either phenotypic or genotypic such as new antibiotic resistant pattern and new metabolic behavior may be found in them. In this study, *Stenotrophomonas* samples were collected from soils and sewage in different parts of Mexico and 43 *Stenotrophomonas* strains were isolated. They belong to three different species (*S. maltophilia*, *S. nitritireducens* and *Stenotrophomonas* spp) based on the BLAST search analysis of the sequenced 16S rDNA nucleotide sequence, which were produced by PCR with our *Stenotrophomonas*-specific primers. *Stenotrophomonas maltophilia* isolates from sewage showed the ability to use arabinose and mannitol as sole carbon source and grew at 42°C, different from Bergey's manual report. *Stenotrophomonas* strains were resistant to most antibiotic tested except fluoroquinolones, including ofloxacin (2.32%), ciprofloxacin (6.98%), and pefloxacin (9.3%) with average multi-resistance index being 70%. Most isolates were resistant to sulfamethazole-trimethoprim (81.4%). This result suggests the need for drug review in the treatment of *Stenotrophomonas* associated infections and the need for empirical drug administration for the treatment of *Stenotrophomonas*-associated infections in Mexico. This is the first study in Mexico which focused on the resistant pattern of non-hospital strains of *Stenotrophomonas* species, and the second to evaluate the susceptibility pattern of *S. maltophilia* in Mexico.

## SESSION I, POSTER G-22

### PRELIMINARY ANALYSIS OF VISCERAL ADIPOSE TISSUE CUTOFF VALUES FOR HISPANICS

Jessica Pena, MPH1, Miryoung Lee, PhD1, Susan Fisher-Hoch, MD1, Joseph McCormick, MD1 1UTHealth, School of Public Health, Brownsville, Texas

#### ABSTRACT

Introduction- Excess visceral adipose tissue (VAT) has been linked to health outcomes including diabetes, insulin resistance, and atherosclerosis. However, literature is limited as to how excess VAT levels may be indicative of adverse health outcomes, especially in Hispanics. The purpose of this study was to estimate cutoff values of VAT associated with diabetes, metabolic syndrome (MetS), and atherosclerosis risk (carotid intima-media thickness, cIMT). Methods- We analyzed VAT area estimated by dual-energy X-ray absorptiometry (DXA), and outcomes of interest in 485 individuals (65% females) from a population-based Cameron County Hispanic Cohort. We used survey-weighted methods for descriptive statistics stratified by sex. Logistic regression analysis was used to examine significant relationships between VAT (measured in cm<sup>2</sup>) and outcomes controlling for age. Receiver Operating Characteristic curves were used to determine best VAT cutoff values. Results- Mean age was 55.0 (standard error, 1.8) years. Thirty-three percent had diabetes, 47% had MetS, and 20% had a mean cIMT>75th percentile for adults of same age and gender. Mean VAT area was 189 (13) cm<sup>2</sup> for males and 168 (8) cm<sup>2</sup> for females. VAT was a significant factor for males with diabetes, and for females with diabetes, MetS, and cIMT risk. VAT cutoff values of 125 cm<sup>2</sup> for men and 186 cm<sup>2</sup> for women were found for diabetes. In women, cutoff values were 157 cm<sup>2</sup> for MetS and 160 cm<sup>2</sup> for cIMT risk. Conclusion- Findings suggest that DXA estimated VAT area cutoff values were between 125 cm<sup>2</sup> and 186 cm<sup>2</sup> for health outcomes and were higher in women. Future research is planned to evaluate the predictive power of VAT cutoff values to identify health outcome risk

## SESSION I, POSTER G-23

### OBAMACARE AND THE CONSUMER EXPERIENCE: A LONGITUDINAL STUDY IN THE RIO GRANDE VALLEY

Ngoc Pham, Doctoral Candidate1, Huan Pham, Pre-med Student2, Lorena Ramon, Doctoral Student1 1The University of Texas – Rio Grande Valley, Edinburg, TX 2University of St. Thomas, Houston, TX

#### ABSTRACT

This paper investigates how healthcare consumers experience the Obamacare (Affordable Care Act, ACA) over the period 2014-2017, particularly when there is a potential replacement of “Trumpcare” (2017 GOP health-care reform plan). In order to investigate how consumers experience the ACA, this paper presents a literature review that covers healthcare services marketing and the Obamacare as public health policy. As a highly complex service, healthcare services marketing is designed to include people, process, and physical evidence (Sreenivas, Srinivasarao, and Rao 2013) with the standard 4Ps marketing (Berkowitz 2010). Moreover, healthcare should be viewed under the light of transformative service research (TSR) as it “treats outcomes related to consumer well-being, including quality of life issues”, more specifically, focuses on citizens below the level of consumption adequacy (Rosenbaum et al. 2011). Considering the ACA as a short-life span health policy (about eight years old) and a health insurance product, public debate continues with much confusion about the ACA (HealthAffairs 2012), particularly its pros and cons to each group of consumers. The question of how consumers experience the ACA is therefore significant and timely. The methodologies used to address this question are in-depth interviews (Thompson, Locander, and Pollio 1993) at two points in time – the fall 2014 and the summer 2017, narrative analysis (Riessman 1993) (phrases 1 & 2), and a follow-up survey design in the fall 2017 (phrase 3). The participants are recruited within Hidalgo County where 33.5 percent of the population lives in poverty (The Texas Tribune 2016). Overall, the findings hopefully will indicate (1) a need for specific marketing concepts in healthcare insurance context, and (2) whether ACA reflects the transformative service marketing direction. Our work will also show preliminary data at two points in time regarding customers cognitive (i.e. awareness, discouragement) and emotional (i.e. fear, insecurity) reflections on the current applications of the ACA system. In addition, this study will record the consumers’ experience on ACA. From here, ACA’s practitioners including insurance companies and healthcare providers such as hospitals and clinics will know how to implement a more suitable strategy to reach low-income consumers.

## SESSION I, POSTER G-24

### DESIGN OF NANOPARTICLES FOR DEATH-INDUCED GENE THERAPY

Jorge A Roacho-Pérez, MSc1, Hugo L Gallardo-Blanco, PhD1, Margarita Sánchez-Domínguez, PhD2, Perla E García-Casillas, PhD3, Christian Chapa-González, PhD3, María L Garza-Rodríguez, PhD1, Alexia Escareño-Cruz, BBME3, Tomás F Galván-Alferez, BBME3, Celia N Sánchez-Domínguez, PhD1 1 Universidad Autónoma de Nuevo León, Faculty of Medicine, Monterrey, NL, Mx; 2 Centro de Investigación de Materiales Avanzados, S. C. (CIMAV, S.C.), Monterrey Unit, Apodaca, NL, Mx; 3 Universidad Autónoma de Ciudad Juárez, Institute of Engineering and Technology, Cd. Juárez, Chih, Mx.

#### ABSTRACT

Death-induced gene therapy consists in the introduction of plasmid DNA (pDNA) into the cancerous cells. pDNA used contains in their sequence a gene that codifies a protein which activates different cellular pathways triggering apoptosis. This pDNA cannot be administrated directly in the patient, because nucleic acids are easily degraded by endonucleases in blood, also because of the pDNA physicochemical characteristics (long negative charged molecule) is difficult for it to cross epithelial barriers and cellular membranes. The goal of this project is the design of cationic nanoparticles which can load nucleic acids in their surface and taking it directly inside the cancerous cell nucleus. Experimental procedure includes the design of magnetite nanoparticles, recovery with different polymers (chitosan, polyethylene glycol and polylactic acid) as pDNA carrier. pDNA used is the commercial plasmid PTracer-CMV2. Also we optimized nanoparticle synthesis (nanoprecipitation), physicochemical characterization (FT-IR and SEM analysis), pDNA loading (electrostatic interactions evaluated in agarose gel electrophoresis) and pDNA protection from enzyme degradation (incubation in blood plasma and degradation evaluation by agarose gel electrophoresis). Results shown adequate synthesis, physicochemical characteristics (size, shape, surface charge, stability, easy sterilization) and loading and protection of pDNA. In conclusion, this nanoparticles area available to continue studied for their application as a pDNA transfection vector. This work was supported by the grant PAICYT 2016 Project Number: SA108-15.

## SESSION I, POSTER G-25

### DESIGN OF A MULTIDIRECTIONAL WEAR TESTING DEVICE FOR SIMULATING WEAR OF BIOCOMPATIBLE MATERIALS USED IN JOINT IMPLANTS

Carlos Rodríguez Betancourth1, Javier Ortega, PhD1 1 Mechanical Engineering Department, The University of Texas Rio Grande Valley

#### ABSTRACT

One of the main causes of joint prostheses failure is the premature wear of its components. Ultra-high molecular weight polyethylene (UHMWPE) is worldwide used as a bearing material in orthopedic implants. Multi-directional motion or “cross-shear” motion has been identified as one of the most significant factors affecting the wear rate of UHMWPE in total hip joint replacement prostheses. It has been found that the trajectory of motion at the point of contact between a femoral head and an acetabular cup takes a general quasi-elliptical or rectangular shape during a gait cycle. In the present work, a novel multidirectional pin-on-disc wear testing device designated CNC-POD (computer-numerical-control pin-on-disc) capable of replicating the cross-shear motions experienced by a prosthesis in vivo was designed and developed in the UTRGV in order to evaluate the wear resistance of new biomaterials. The CNC-POD consists of six temperature-controlled pin-on-disc stations mounted on a two-axis CNC table (X-Y). Each pin-on-disc station is load-programmable up to 510 Newtons (115 pounds). The CNC table allows the machine to reproduce a wide range of 2D patterns in millimeter scale on the six stations under a specific load. Friction force is measured during testing using force sensors and coefficient of friction can be calculated. Motions and loads are fully programmable through LabView. Using this system it is possible to simulate both unidirectional and bidirectional sliding between the contact surfaces, and measure the combined effect of multidirectional motion and variable

## SESSION I, POSTER G-26

### PHARMACOGENETICS OF HYPOGLYCEMIC DRUGS USED TO TREAT MEXICAN PATIENTS WITH TYPE 2 DIABETES

Sánchez-Ibarra, HE1, Luna-Aguirre, CM1; Morales-Alvarado, IA1; Reyes-Cortés, LM1; Espinosa-Mata, T1, López-Tavera, E1, Chairez-Cantú, K1, Rivera-Prieto, RA4; León-Cachón, RB3; Cerda-Flores, RM2; Barrera-Saldaña, HA1 1Genomic Bioanalysis Laboratory. Vitagénesis, SA de CV. Monterrey, N.L. México 2Facultad de Enfermería, Universidad Autónoma de Nuevo León, Monterrey N. L. México 3Centro de diagnóstico molecular y medicina personalizada, Departamento de Ciencias Básicas, Vicerrectoría de Ciencias de la Salud, Universidad de Monterrey, Monterrey, N. L. México 4Instituto Tecnológico y de Estudios Superiores de Monterrey, Monterrey N. L. México

#### ABSTRACT

The treatment of Type 2 Diabetes Mellitus (T2DM) consists primarily of oral antidiabetic drugs (OADs) that stimulate insulin secretion, reduce hepatic glucose production, delay digestion and absorption of intestinal carbohydrate or improve insulin action. The marked interindividual differences in T2DM patients’ response to these drugs have become an issue on prescribing and dosing efficiently. In this study, nine polymorphisms selected from Genome-wide association studies were screened by Real-Time PCR in 495 T2DM Mexican patients previously treated with different OADs to find the relation between the presence of polymorphisms and response to OADs. Two polymorphisms, A1369S in gene ABCC8 and E23K in gene KCNJ11 had a significant impact on response to sulfonylureas (SUs), an OAD that stimulate insulin secretion. Heterozygous ABCC8 E23K variant (A/C) carriers evinced a higher response to SUs compared to homozygous (A/A) variant carriers (P=0.029) and to homozygous wild-type (C/C) carriers (P=0.012). The homozygous KCNJ11 E23K variant (C/C) and wild-type (T/T) carriers had a lower response to SUs compared to heterozygous (C/T) carriers (P=0.039). The screening for these polymorphisms could help to improve the prescribing and dosing of SUs for T2DM patients and thus to personalize treatments. This project was funded by CONACYT research grant number 218098.

## SESSION I, POSTER G-27

### ISOLATION AND CHARACTERIZATION OF C-TYPE LECTINS FROM SOUTHERN PACIFIC RATTLESNAKE ON HUMAN DERMAL LYMPHATIC ENDOTHELIAL CELLS

Shelby Szteiter1, Montamas Suntravat, PhD1, Elda Sanchez, PhD 1&2

1 National Natural Toxins Research Center (NNTRC), Texas A&M University-Kingsville, MSC 224, 975 West Avenue B, Kingsville, TX 78363, USA; 2 Department of Chemistry, Texas A&M University-Kingsville, MSC 161, Kingsville, TX 78363, USA.

#### ABSTRACT

Crotalus oreganus helleri (Southern Pacific Rattlesnake) is responsible for the majority of severe envenomations in southern California. Bites cause local tissue damage including prominent edema or/and hematological abnormalities. The main components of C. o. helleri venom are enzymatic enzymes including metalloproteinases and phospholipases A2s, which play a major role in the pathogenesis of local tissue damage. On the other hand, non-enzymatic proteins (such as disintegrins, C-type lectins, cysteine-rich secretory proteins, and myotoxins) also play a role in the envenoming. C-type lectins are commonly found in low amounts in most snake venoms. They bind to plasma proteins, specific receptors on platelets, vascular or lymphatic endothelial cells and interfere in the prey’s physiological processes. C-type lectins are also considered promising molecules for research tools and treatment of certain diseases. The goal of this project is to isolate C-type lectins from C. o. helleri venom to determine their biological activities. We have isolated C-type lectins using reversed-phase chromatography. Fractions 37, 38, 40, and 43 contained C-type lectins with molecular weights about 26 kDa as determined by SDS-PAGE and N-terminal sequencing. They will be further purified using cation exchange chromatography. Purified C-type lectins will be tested for cellular functions on human dermal lymphatic endothelial cells (HDLECs). Studies of these C-type lectins not only facilitated a better understanding of the snakebite pathology but also lead to the development of therapeutic agents. Funding for this project was provided by Viper Resource Grant# P40OD01960 and NIH/NHLBI Grant# 1R15HL137134-01.

## SESSION I, POSTER G-28

### ESTIMATING THE ANNUAL COST OF HIGH BLOOD PRESSURE COMPLICATIONS ON YOUNG ADULTS: A SIMULATION APPROACH

Francisco Rafael Torres Diaz, B.S., Douglas Timmer, Ph.D., Hiram Moya, Ph.D. University of Texas Rio Grande Valley

#### ABSTRACT

Medical costs estimates are wide ranging or non-existent, yet they can influence preventive care, in particular asymptomatic conditions like high blood pressure (HBP). To address this, a simulation model and expected cost function were developed to determine the annual expected cost of medical complications associated to misdiagnosis of HBP in young adults. According to



the American Heart Association, adults 18 to 24 years old are 28% less likely of being diagnosed with HBP on regular medical visits compared to those 60 or older. The simulation will make use of the Poisson distribution to assess the probability of common risk factors associated with HBP to estimate the average risk factor of false negatives in HBP diagnosis for young adults nationally and determine the proportion of cases falling in the different HBP categories. This average risk factor estimate will be included in the cost function to compute the individual economic impact based on known complications of uncontrolled HBP. The national case will then be a comparison point for the case study into the South Texas region.

**SESSION I, POSTER G-29  
POLYMORPHISMS WITHIN RYR3 GENE ARE ASSOCIATED WITH RISK AND AGE AT ONSET OF HYPERTENSION**

Hugo Tovar<sup>1</sup>, Valeria Gonzalez<sup>1</sup>, Ke-Sheng Wang<sup>2</sup>, Chun Xu\*<sup>1</sup> 1. UTRGV-BMED; 2Department of Biostatistics and Epidemiology, East Tennessee State University

**ABSTRACT**

Hypertension affects 33% of Americans, leading to increased morbidity and mortality of cardiovascular disease. The etiology of hypertension is multi-factorial, including gene-gene and gene-environment interactions. The gene of interest in this study, Ryanodine receptor 3 gene (RYR3), located at 15q13.3, has previously shown to mediate mobilization of calcium ions (Ca<sup>2+</sup>) in cardiac and skeletal muscle, and is expressed in human arterial endothelial cells which supports its potential role in hypertension related phenotypes. However, no study has assessed the association between RYR3 and hypertension. In this study, we used the NIA-LOAD family data including 3007 individuals (1036 cases), and the Marshfield case-control sample (825 cases) to explore if RYR3 variants have significant association with risk and age at onset (AAO) of hypertension. Single marker analysis based on FBAT – GEE showed seventeen single nucleotide polymorphisms (SNPs) associated with risk of hypertension, and five SNPs associated with AAO of hypertension ( $p < 0.05$ ). Of these, the ones showing most association were rs169733232, rs2291736, and rs4780118 for risk of hypertension, and rs1051981, rs2596230 and rs8023659 for AAO of hypertension. Accordingly, based on the Marshfield case-control sample showed fourteen SNPs associated with risk of hypertension, and fifteen SNPs associated with AAO of hypertension ( $p < 0.05$ ). The ones showing the most association were rs10519835 and rs1565937 for risk of hypertension, and rs7497692 for AAO of hypertension. Moreover, several disease associated SNPs expressed RYR3 at lower levels. Altogether, we identified RYR3 variants in hypertension, for the first time, using two large cohort samples. This study provides insight into the genetic control of hypertension. The study, in part, was supported by UTRGV startup fund for Dr. Xu

**SESSION I, POSTER G-30  
RISK CHARACTERIZATION AND BARRIERS TO HEALTHCARE IN AN UNDERSERVED POPULATION ON THE SOUTH TEXAS MEXICO BORDER**

Jaime Villafranca BS<sup>1</sup>, Eldibrando Ramos BS<sup>1</sup>, Claudia Silva BS<sup>1</sup>, Bassent Abdelbary, MD, MPH, PhD<sup>1</sup> 1 University of Texas Rio Grande Valley, Department of Physician Assistant

**ABSTRACT**

**Objective:** The Rio Grande Valley (RGV) has been largely identified as a morbidly obese region with a high prevalence of many diagnosed and undiagnosed comorbid conditions together with low access to healthcare. Our ongoing study aims at investigating health care disparities in the RGV, identify barriers to healthcare and the impact on cardiovascular disease (CVD) risk in an underserved population along the South Texas Mexico Border. **Methods:** This is an ongoing study, attendees of public health fairs in the RGV are recruited by answering a quick survey together with gathering their anthropometric measures and laboratory results. We hypothesize that the prevalence of comorbid conditions will be at least two times higher than in the general population. Cross sectional analysis by CVD risk (ASCVD 10 year and lifetime risk) will identify differences in sociodemographic and other underlying factors as well as barriers to healthcare. **Results:** Our preliminary results (n= 34) showed that our participants are 64.7% females, mean age 47 years old, 64.7% born in the United States, 61.8% have completed college education, and 44.1% are living under 133% of the federal poverty level. When evaluating their healthcare access, 41.2 % are uninsured with 64.3% of them state that they cannot afford having healthcare insurance. Mean body mass index was 31.7 with 61.4% of the participants falling in the obese category and 72.7% had low HDL levels. **Discussion:** This ongoing study quantifies CVD risk and obstacles to healthcare access in a special underserved subpopulation on the South Texas Mexico border in order to increase awareness and public health directed interventions.

**SESSION I, POSTER G-31  
ANALYSIS OF DENGUE INCIDENCES IN REYNOSA, TAMAULIPAS, MÉXICO (2008-2016)**

Carlos E. Villalón-Barrón, MSc<sup>1</sup>, Gloria L. Doria-Cobos, MD<sup>2</sup>, Pablo G. López, MD<sup>2</sup>, Antonio Gutiérrez-Sierra, MD<sup>1</sup>, Netzahualcoyotl Mayek-Pérez, DSc<sup>1</sup> 1 School of Medicine, Universidad México Americana del Norte, Reynosa, Tamaulipas, México; 2 Jurisdicción Sanitaria IV, Secretaría de Salud, Reynosa, Tamaulipas, México.

**ABSTRACT**

Dengue caused by any four serotypes of DENV arbovirus was reintroduced to Mexico since 1978. Two types of dengue could be founded: dengue fever (DF) or dengue hemorrhagic fever (DHF) and they constitute a major health public problem in the country. This work was the aim to analyze DF and DHF incidences in Reynosa, Tamaulipas as well as to associate them with weather conditions. Epidemiologic study of dengue prevalence at Reynosa through nine years (from 2008 to 2016) based on statistics provided by local health Institutions and CENAPRECE-México and its correlation with weather conditions. No significant associations between DF and DHF incidences and weather conditions were found. DF and DHF incidences were similar among gender although the highest values were found in women in 2013 and 2012. Highest dengue incidences happened during 2013-2016; October and November showed the highest DF and DHF incidences and the lowest were detected during December-May. Highest incidences were found in men 0-20 years-old (DF) and both gender with 11-30 years-old (2013-2016); from 2008 to 2012 the highest DF values were detected in men 11-20 years-old and women 21-30 years-old (DHF). In conclusion, dengue incidences (DF and DHF) in Reynosa, Tamaulipas was most higher in 2013 during October to November in young people (less than 30 years-old). Dengue prevalence was not related with weather conditions. Dengue incidences are increasing despite preventive strategies. Control could be successful if strategies are focused on health education.



# Medical Student Category

## Poster Presentations

### SESSION II, POSTER M-1 IMPLEMENTATION OF AN IMMEDIATE POSTPARTUM LONG-ACTING REVERSIBLE CONTRACEPTION PROGRAM AT A LARGE SOUTH TEXAS HOSPITAL.

*Kyle Biggs DO, Saul Rivas MD, MSPH, Laura Fonseca MD, Normal Garcia DO, Tony Ogburn MD, Department of Ob/Gyn, UTRGV School of Medicine, Edinburg, Texas, USA.*

#### ABSTRACT

Immediate postpartum long-acting reversible contraception (IPPLARC) provision is a recommended approach to providing effective contraception that has been difficult to implement in the United States. We used a process known as Change Acceleration to rapidly and effectively implement an IPPLARC program at a large, south Texas hospital. This site is now one of the first and only hospitals in Texas to offer IPPLARC to its patients. Our abstract is a qualitative review that describes the process used to implement an IPPLARC program. The Change Acceleration Process (CAP) model illustrates key steps involved in and provides a common language for facilitating effective change in an institution. We used tools specific to the CAP model to assist in transitioning from a current state without an IPPLARC program to a future state where one existed. Specifically, we identified a LARC champion and team leaders to lead the change and promote the new program to other hospital departments. This was accomplished by first creating a shared need across the institution for the program. Next, we shaped a vision for what the program would look like once in place by spreading a unified, consistent, and compelling message. We then mobilized commitment within the hospital departments of administration, pharmacy and the billing and coding. CAP tools including stakeholder and a technical, political and cultural (TPC) analyses were employed to overcome resistance and gain acceptance for the program. Through this process, we successfully implemented an IPPLARC program over nine months. Future efforts will be directed at maintaining and expanding the program, and monitoring its progress.

### SESSION II, POSTER M-2 THE EFFECTS OF PNEUMATIC COMPRESSION ON COMMON SYMPTOMS AND OVERALL QUALITY OF LIFE SECONDARY TO LYMPHEDEMA OF THE LOWER EXTREMITIES

*Joseph Boateng (MS-2), Jay Radhakrishnan, M.D., RVT, RPVI, University of Texas Rio Grande Valley (UTRGV) School of Medicine, Edinburg, TX*

#### ABSTRACT

Introduction: Lower extremity (LE) lymphedema is a common, incurable disease with substantial mortality. Current evidence-based clinical practices aim to improve lymphatic drainage from the lower extremity. There is well-documented evidence on the efficacy of pneumatic compression devices (PCD) in managing lower extremity lymphedema. However, there is little published literature on the effects of PCDs on patients' quality of life. Objective: To evaluate how PCDs affect the symptoms and quality of life of patients with lower extremity lymphedema. Methods: Survey data collected from 25 lower extremity lymphedema patients receiving successive prescribed PCD treatments for at least 3 months at a single medical practice. The principal outcomes for analysis were self-reported relief of symptom and overall quality of life. Results: 76% of respondents treated with PCD reported a high overall quality of life or better compared to a pre-PCD treatment of 12%. Patient-reported outcomes indicated a significant improvement in patients reporting high/very high levels of LE pain (from 40% to 12%), LE swelling (from 64% to 12%), LE heaviness (from 60% to 12%), and 36% of PCD-treated patients reported at least a high level of daily ambulation compared to 8% before treatment. Conclusion: Use of PCD is strongly associated with patient-reported reductions in common lymphedema symptoms. The results also indicate a significant improvement in patient-reported level of daily ambulation and overall quality of life. Further studies are required by using objective clinical data to validate findings from this study

### SESSION II, POSTER M-3 TKA REVISION RISKS AMONG HISPANICS

*John Boxberger1, Ventrice Shillingford-Cole1, Kathleen Harnois1, Jennifer Nordhauser1, Chance C Moore1, Joel Michalek1, Matthew Charles Morrey2, Roberto Jose Fajardo1 1University of Texas Health Science Center at San Antonio 2Christus Physicians Group (Christus Orthopaedics & Sports Medicine)*

#### ABSTRACT

While minority outcomes have not been emphasized in current literature, limited data suggest that minority populations experience poorer outcomes following total knee arthroplasty (TKA) procedures. TKA outcomes among Hispanics in particular are not well documented in the literature despite the fact that they represent the fastest growing racial/ethnic group in the United States, projected to become the 2nd largest racial/ethnic group by 2050. Some evidence from large healthcare database analyses suggests that post-operative complications and revisions are more common among Hispanics compared to non-Hispanic patients. OBJECTIVE: The hypothesis that Hispanics have a disproportionate risk of TKA revision was established during initial retrospective data collection. In our study, we report on initial findings of a retrospective and prospective study investigating the impact of race/ethnicity, implant type, diabetes and BMI (and other associated risk factors) on TKA outcomes. Extensive healthcare database analyses offer evidence that post-operative complications, including infection, are more common in Hispanics than non-Hispanic patients. METHODS: Employing retrospective methods, post-operative data for outcomes up to three years post-surgery were abstracted from 477 TKA events between 2009 and 2015. All protocols were approved by the institutional

IRB and data were entered into a REDCap database. Potential complications (e.g. implant loosening, fractures, radiolucencies, infections and manipulations under anesthesia) were documented, in addition to data on age, sex, race, ethnicity, disability status, insurance coverage and comorbidities. Implants prior to March 2013 were listed as metal-backed, while all implants after this date used all-polyethylene implants. The primary outcome variable was the need for surgical revision and secondarily, revision due to infection. SETTING: Surgeries were performed by a high volume, single surgeon in one of three surgical locations in San Antonio, TX. Immediate post-operative care was maintained at the surgical hospital. All pre-operative and post-operative visits were either performed by the surgeon or a Physician's Assistant at an outpatient clinic. Post-operative visits were recorded on dates 2 weeks, 6 weeks, 3 months, 1 year, 2 years and 3 years following initial surgery. PARTICIPANTS: Patients (n=477) with TKA CPT code (27447) documented on EMR were included. Implants requiring additional augmentation secondary to bone defects or revision after another surgeon's initial surgery were excluded. RESULTS: Of the 477 patients, we found 19 who required revisions. Stratifying data based on ethnicity, Chi-square analysis indicated an increased risk among Hispanics for TKA revision (all causes) surgery (p=0.0107). Further analysis demonstrated that surgery type (primary or revision) is not associated with implant type (metal or all-polyethylene) (p=0.1101). Regarding revision TKA in Hispanics versus non-Hispanics, the odds ratio was 1.53 (CI=.3-7.81) and relative risk was 0.423. DISCUSSION AND CONCLUSION: Previous studies suggest that high volume surgeons should, on average, have a lower complication rate. However, the data suggests a higher than average complication rate amongst the Hispanic cohort. This analysis strongly suggests that Hispanics are at a greater risk for revision surgery (all causes) after TKA. This risk is independent of tibial implant type (metal-backed or all-polyethylene). These data highlight the need for further investigation into the rates and causes of TKA revision surgery among Hispanics and other minority populations to ensure the highest quality of care.

### SESSION II, POSTER M-4 INVESTIGATING THE GENETIC DETERMINANTS OF ANXIETY DISORDERS AND REGIONAL BRAIN MORPHOLOGY

*Leah K. Bryan1,2, Joanne E. Curran2, David C. Glahn3,4, Ravindranath Duggirala2, John Blangero2, Nicholas B. Blackburn2 1 School of Medicine, University of Texas Rio Grande Valley, TX, USA 2 South Texas Diabetes and Obesity Institute, School of Medicine, University of Texas Rio Grande Valley, TX, USA 3 Department of Psychiatry, Yale University School of Medicine, New Haven, CT, USA 4 Olin Neuropsychiatry Research Center, Institute of Living, Hartford Hospital, Hartford, CT.*

#### ABSTRACT

USA Anxiety disorders are the most common mental illness in the United States and come with a complex set of risk factors. Numerous studies have highlighted possible genetic, environmental, and morphological causes for anxiety disorders. However, few studies have observed large familial cohorts to investigate a genetic correlation between regional brain morphology and diagnosis. In our population of 1,385 Mexican American individuals from extended pedigrees, 290 were diagnosed with any form of anxiety and 49 diagnosed with PTSD. We performed preliminary heritability analyses (accounting for variance due to sex and age) to determine if there is a genetic component to disease risk. The heritability of anxiety (defined as any diagnoses of generalized anxiety disorder, panic disorder, PTSD, social phobia, specific phobia, or OCD) was 16.6% (p = 0.021). Interestingly, independent of anxiety, PTSD was significantly heritable, showing that 61.6% (p = 0.004) of the variance in the trait is due to genetic factors. PTSD also showed strong familial clustering in 26 of 111 families. Several regional brain volume differences have been indicated in PTSD including hippocampal, parahippocampal, amygdala, thalamus, and anterior cingulate cortex. The heritability of MRI measures of these brain regions was analyzed in the same 1,385 individuals and all were found to be heritable. Differences in these brain regions have also been described in other anxiety disorders. The next step in these analyses will be to determine whether there is a genetic correlation between anxiety, and specifically PTSD, and morphological differences in these brain regions; determine whether any of these genetic influences are shared between traits; and identify rare functional sequence variants (derived from whole genome sequence) influencing disease risk.

### SESSION II, POSTER M-5 CHARACTERIZING POSSIBLE AUTOIMMUNE DIABETES PHENOTYPES AMONG THE CAMERON COUNTY HISPANIC COHORT

*Ye Ji Choi1, Christiane S. Hampe, PhD2 1 University of Texas Rio Grande Valley School of Medicine, Edinburg, TX; 2 Department of Medicine, University of Washington, Seattle, WA*

#### ABSTRACT

An increasing number of patients with diabetes do not conform to the traditional forms of Type 1 and Type 2 Diabetes (T1D and T2D). One of these forms of "atypical" diabetes has been described as Latent Autoimmune Diabetes in Adults (LADA), defined as patients diagnosed with T2D, but positive for at least one of the islet cell autoantibodies associated with T1D: glutamate decarboxylase (GAD65), islet antigen (IA-2), and zinc transporter 8 (ZnT8). LADA patients are prone to developing insulin requirement within 5 years of their diagnosis with T2D. Most of the previous study cohorts consist of Caucasian or Asian subjects, while there is a lack of studies in diabetics with Hispanic/Latino backgrounds. Here we investigated the frequency of autoimmune diabetes phenotypes among the Cameron County Hispanic Cohort (CCHC). Serum samples of 312 selected subjects of the CCHC were analyzed via radioligand binding assay for the presence of T1D-associated autoantibodies. None of the subjects was diagnosed with diabetes, or received anti-diabetes medication. Autoantibody data and clinical parameters of metabolic syndrome (MetS) were used to estimate risk for development of diabetes. Twenty-two individuals (7%) tested positive for at least one autoantibody. Considering autoantibody-positivity and parameters of MetS, we identified ten patients at risk for developing LADA. These patients had a median age of x and median BMI of x. Moreover, they showed signs of insulin resistance as established by HOMA-IR. Individuals at risk for developing T1D (n=7) were significantly younger (median age y), leaner (median BMI y) and showed no indication of insulin resistance. We identified five individuals with atypical phenotypes. These patients were either lean, but showed insulin resistance, or were overweight with indications of MetS, but no elevated insulin resistance. This study demonstrates the high frequency of atypical diabetes among autoantibody-positive subjects and suggests detailed follow-up to ensure proper diagnosis. Funding was provided by the National Institutes of Health (RO1 DK026190) and the NIDDK Medical Student Research Program in Diabetes – University of Washington Diabetes Research Center (P30 DK017047, T32 DK007247-39).



**SESSION II, POSTER M-6****TRAUMATIC INJURY MITIGATION IN AN OCCUPATIONAL SETTING USING ANATOMICAL INJURY SCORE***Carolyn Elizabeth Cuevas, PhD1, Weihsueh Chiu, PhD2, Scott Lillibridge MD2 1 UTRGV School of Medicine; 2 Texas A&M University***ABSTRACT**

The development of a comprehensive epidemiological methodology for trauma assessment and mortality classification for law enforcement officers killed in the line of duty, using an interdisciplinary approach provides the foundation for an occupational risk assessment. The central hypothesis that some law enforcement officer line of duty deaths are from injuries that are clinically, potentially survivable. Describing patterns of fatal injuries and identifying risk to develop a framework may reduce the severity and occurrence of fatal injuries in the line of duty. Eighty-four traumatic fatalities sustained by Texas DPS Highway Patrol Officers in the line of duty were reviewed using trauma injury severity scoring to determine potentially survivable injuries. Injuries resulting in twenty-five potentially survivable deaths were evaluated with consideration to established Tactical Combat Casualty Care (TCCC) interventions, such as tourniquets and needle decompression, for their possible impact on survivability for injuries sustained in the line of duty. Truncal hemorrhage was noted to be the most common cause of death with opportunity for future mitigation. Lastly, health hazards impacting officer deaths were evaluated focusing on environmental and operational risk factors that have the potential to influence survivability. Opportunities for risk mitigation relating to automobile accidents could improve survivability and reduce line of duty deaths. These studies contribute to a more comprehensive understanding of fatal injuries sustained in the line of duty. A long-term goal of this study is to apply this traumatic injury review methodology to other populations in order to prioritize mitigation efforts and recommend risk reduction strategies aiming to reduce the severity and occurrence of injuries sustained in the line of duty

**SESSION II, POSTER M-7****THE HUMAN RIGHTS FRAMEWORK AS A TOOL TO STUDY THE ZIKA EPIDEMICS IN VENEZUELA***1Jared Eaves, BBA, 2Carmen Paz, PhD, 2Carlos Valbuena, PhD, 3Luis R. Homes, 4Rosa V. Pirela, BSc, 5Gladys E. Maestre, MD, PhD. 1 The University of Texas Rio Grande Valley School of Medicine, Edinburg, Texas; 2 University of Zulia, Maracaibo, Venezuela; 3 Department of Anthropology and Department of Psychology, University of Colorado Boulder College of Arts and Sciences, Boulder, Colorado; 4 FundaConCiencia, Maracaibo, Venezuela and Miami, Florida; 5 Department of Biomedical Sciences, Division of Neurosciences, School of Medicine, The University of Texas Rio Grande Valley, Brownsville, TX.***ABSTRACT**

Epidemics of infectious disease are an increasing public health concern around the world, including the most recent epidemics of Zika virus in the Americas. Of the Zika virus-affected countries since 2015, Venezuela has endured one of the harshest impacts, and concurrent socio-political and economic crises have maximized the consequences. We used a human rights framework to assess the impact of Zika virus in Venezuela and to examine how shortcomings in human rights protections have affected vulnerability to epidemics and exacerbated the consequences. The human rights framework refers to the Universal Declaration of Human Rights, along with associated guidelines and principles about how they can be interpreted and applied. This framework has allowed us to analyze whether the social, civil, political, economic, and cultural rights of individuals are respected, fulfilled, and protected beyond strict legal compliance. In this analysis, we used epidemiological data, interviews with healthcare providers and information from international organizations and individual Venezuelans, including parents of children born with microcephaly in 2016. We applied human rights principles, such as justification and proportionality, to assess complex issues surrounding the Venezuelan epidemics, which require balancing of competing rights and interests. Our analyses showed that the response to the Zika epidemics focused on disruption of transmission through surface-level interventions such as vector control. However, little attention has been paid to the underlying socioeconomic factors and human rights that were key in influencing past epidemics of other infectious agents. Thus, the national and international responses to Zika epidemics in Venezuela have been insufficient to counteract its effects. Discussion is needed regarding the implementation of the human rights framework on a broader scale, to ensure effective delivery of public services while maintaining respect for individual rights, and focusing on the needs of individuals during unexpected circumstances such as epidemics.

**SESSION II, POSTER M-8****IMPACT OF INTEGRATED INTERPROFESSIONAL CARE ON TRIPLY-DIAGNOSED ADOLESCENTS***Kaitlyn L. Hall, BS1, Rafael A. Raya, BS1, Alexandra Bulga, BS1, Stephanie Leal, MS1, Vincent P. Diego, PhD1, Sudershan Pasupuleti, PhD2, John Lowdermilk, PhD3, Linda Nelson MSN1, Francisco Fernandez, MD1, Eron Manusov, MD1 1University of Texas Rio Grande Valley School of Medicine, Edinburg, TX 2University of Texas Rio Grande Valley College of Health Affairs, Edinburg, TX 3University of Texas Rio Grande Valley College of Education and P-16 Integration, Edinburg, TX***ABSTRACT**

The Integrated Care Collaborative Unit (ICCU) within the John Austin Peña Memorial Center (JAPMC) serves to provide inter-professional care for adolescents ages 12-18 triply-diagnosed with mental, addictive, and medical disorders within the Rio Grande Valley. A collaboration between UT Rio Grande Valley School of Medicine and Hidalgo County Health Department, the JAPMC addresses the needs of its patients via a team approach, utilizing resources from thirteen different professions (i.e. physicians, nurse practitioners, physician assistants, social workers, nutritionists, etc.). The JAPMC also provides twenty-five on-site professional services including GED classes and courses promoting self-reliance, self-efficacy and resiliency. To assess the efficacy of the integrated care, a cohort of triply diagnosed adolescents were measured for height, weight, blood pressure, BMI and PHQ-9 scores (screening tool assessing the severity of depression) initially and then at three month intervals. Paired t-test results has shown a noticeable decrease in PHQ\_9 scores in individuals over a six month time span since the initial visit as well as decreases in blood pressure and BMI. Future studies would aim to compare the inter-professional team care approach against other standard models of care. Continuing work would also seek to address the challenges to the success of integrated care including lack of insurance, transportation and poverty. Funding was provided by the Methodist Healthcare Ministries of South Texas (450000888).

**SESSION II, POSTER M-9****A BIRD'S EYE VIEW OF "A VOICE IN YOUR EAR" PODCAST PROJECT***Michael LaPelusa, Joy Alvarado, Valerie Terry, Ph.D., Arden Dingle, M.D., The University of Texas Rio Grande Valley, School**of Medicine***ABSTRACT**

Background In July 2017, UTRGV School of Medicine matriculated their second first-year cohort (Class of 2021). Student leaders from the first cohort (Class of 2020) conceptualized offering a helping hand to the new class to facilitate their transition into medical education. The idea was to provide the new students the benefit of the experiences of the Class of 2020 in an innovative and practical manner. Program Description The project's vision is one by students for students, that is, student-created, student-driven. Some constraints included time and resource limitations, logistical complexities exacerbated by geographical distance, scheduling complications and competing priorities. Opportunities such as forming close collaborations with UTRGV campus partners (namely, the Center for Online Learning, Teaching and Technology that donated staff time and their professional quality recording studio and production equipment) presented themselves. Ultimately, a podcast channel containing twenty themed episodes were produced and rolled out via iTunes and an Android Podcast Player application. Podcast content contributors were medical students, faculty, staff and Administration as interactive interviews, conversations and other engaged formats. The UTRGV student-run newspaper highlighted this partnership in a story about the project. Other issues managed cooperatively included how to publish the podcasts, whether to keep them private or make public, how to introduce the channel to the new students, how to document the project's effectiveness, obtaining Institutional Review Board (IRB) approval for human subjects research, and conducting benchmark measures without "tipping our hand," compromising the surprise factor for the new students. Discussion The long-term project goal is for the podcasts to be sustained, adding new content tailored for future cohorts. This presentation will outline processes that were effective in successful implementation so that pre-matriculation and other orientation material developers, medical students interested in engaging in a medical education project, and other new medical schools may model them.

**SESSION II, POSTER M-10****ASSESSING KNOWLEDGE AND UNDERSTANDING OF HIV IN COLLEGE AGE STUDENTS***Leah Bryan, Christine Loftis, Sravan Narapureddy, David Ortiz: UTRGV School of Medicine, Edinburg, Texas***ABSTRACT**

There are approximately 1.1 million people living with HIV in the United States. (CDC 2016) Texas ranked 3rd in all states with number of diagnosed HIV infections. Hidalgo county alone had 79 new cases of HIV, ranking 7th in Texas for new HIV diagnoses and Cameron County ranked 11th with 61 new cases. (Texas Department of State Health Services 2016) Despite the increasing number of HIV cases, sexual education and HIV education are not mandated in Texas schools. (Guttmacher Institute 2017) In the 2015-2016 school year 25% of Texas schools offered no sex education and 60% of districts used abstinence only. (Texas Freedom Network 2017) There is a need to educate college age students on the risks of HIV infection. To effectively provide education to college age students in the Rio Grande Valley, we seek to first assess the knowledge and understanding that these students have of HIV. To do this, we plan to administer surveys to first and second year medical students that assess preconceptions about HIV and will covers statistics regarding prevalence, transmission facts, drug pharmacology, risk reduction, prevention, and sexual health. We hope that this information will provide insight into deficiencies in knowledge about HIV and how this may benefit future educational presentations about HIV. This information will also allow for resource recommendations to be made based on where the deficiencies, if any, lie.

**SESSION II, POSTER M-11****ASSESSING THE VALIDITY OF A PYRUVATE TOLERANCE TEST AS A MEASUREMENT OF GLUCONEOGENIC CAPACITY***Niral Patel1, Nicholas Mignemi, PhD1, Lianyi Chen1, Owen McGuinness, PhD1 1. Department of Molecular Physiology and Biophysics, Vanderbilt University, Nashville, Tennessee***ABSTRACT**

One current approach to measure the gluconeogenic capacity of the liver is through a pyruvate tolerance test (PTT). We hypothesized that a PTT is unreliable due to extrahepatic tissue's usage of pyruvate. In addition, the provision of only pyruvate as opposed to lactate and pyruvate disrupts the cellular redox state, further complicating data interpretation. To determine the validity of this test, the impact of exogenous pyruvate and combined lactate and pyruvate (10:1) on glucose concentration, hepatic glucose production, and whole-body glucose utilization in fasted mice was assessed. In addition, the impact of exogenous pyruvate versus a physiologic lactate-pyruvate mixture to clamp cellular redox state on blood glucose levels in fasted mice was compared. Overnight fasted c57/bl6j mice received intraperitoneal injections of saline, pyruvate, or lactate-pyruvate mixture. Blood glucose levels were sampled via the lateral tail vein at six timepoints after injection. Additional chronically catheterized (carotid artery & jugular vein) conscious mice were fasted overnight and received a primed continuous infusion of [3-3H] glucose to assess glucose kinetics. During steady-state tracer infusion period, the mice received intraperitoneal injections of saline, pyruvate, or lactate-pyruvate mixture. Blood glucose, insulin, and metabolite levels were sampled from the carotid artery at multiple timepoints. Results showed that pyruvate and lactate-pyruvate mixture significantly raised blood glucose levels compared to saline and then returned to baseline. The lactate-pyruvate group showed a higher peak level of blood glucose than the pyruvate group. The tracer data are pending; however, the physiologic mechanisms of a PTT should be further analyzed based on the differing responses of the glucose profile. Funding: DK043748, DK059637, DK020593, T35 DK007383.



## SESSION II, POSTER M-12

### ESTABLISHING THE INTEGRATED CARE COLLABORATIVE UNIT AT THE JOHN AUSTIN PENA MEMORIAL CENTER: INSIGHTS ON PROGRAM DEVELOPMENT

Rafael A. Raya, BS1, Alexandra Bulga, BS1, Kaitlyn L. Hall, BS1, Stephanie Leal, MS1, Vincent P. Diego, PhD1, Sudershan Pasupuleti, PhD2, John Lowdermilk, PhD3, Linda Nelson MSN1, Francisco Fernandez, MD1, Eron Manusov, MD1 1UT Rio Grande Valley School of Medicine, Edinburg, TX 2UT Rio Grande Valley College of Health Affairs, Edinburg, TX 3UT Rio Grande Valley College of Education and P-16 Integration, Edinburg, TX

#### ABSTRACT

Supported by evidence on the efficacy of integrating primary care and behavioral health, the Integrated Care Collaborative Unit (ICCU) was created within the John Austin Peña Memorial Center (JAPMC). A collaboration between the UTRGV School of Medicine, College of Health Affairs, Department of Social Work, the College of Education and P16 Integration, and the Hidalgo County Department of Health and Human Services, the ICCU and accompanying programs supplement the care of medically underserved, socioeconomically disadvantaged, triply-diagnosed adolescents. The integration with the JAPMC (an established rehabilitation treatment facility) resulted in the availability of thirteen different professions (i.e. physicians, nurse practitioners, physician assistants, social workers, nutritionists, etc.) within a centralized location. The JAPMC also provides twenty-five on-site professional services including GED classes and courses promoting self-reliance, self-efficacy and resiliency. Including first-hand accounts of individuals directly involved in the formation of the ICCU, this article examines the development of the interprofessional framework of the JAPMC, the roles of each profession and how they enhance patient care, and the maintenance of the interprofessional team which provides positive outcomes for the JAPMC patients. This article also outlines the challenges and accomplishments of the ICCU as well as recommendations for the future of the JAPMC and other comparable models. Funding was provided by the Methodist Healthcare Ministries of South Texas (450000888).

Session II, Poster M-13

### QUANTIFICATION OF BRAIN CRF PEPTIDE IN RATS TREATED WITH CRF RECEPTOR ANTAGONIST FOLLOWING INDUCTION OF ENDOMETRIOSIS

Rogelio Montes, BS 1, Yammile Vargas 2, Leslie Rivera-Lopez, BS 1, Caroline B. Appleyard, PhD 3, Annelyn Torres-Reveron, PhD 1 Dept. of Biomedical Sciences, School of Medicine, University of Texas at Rio Grande Valley, Edinburg, TX; Dept. of Health Affairs, University of Texas at Rio Grande Valley, Brownsville, TX; Dept. of Basic Sciences, Ponce Health Sciences Univ./Ponce Research Institute, Ponce, Puerto Rico.

#### ABSTRACT

Endometriosis is a disorder in which endometrial tissue is found outside the endometrial cavity causing pain, infertility and stress. We have previously documented that stress can negatively affect the progression of endometriosis. Corticotropin releasing factor (CRF) is one of the main signaling peptides within the hypothalamic pituitary adrenal axis released in response to stress. CRF can affect nervous and visceral tissues such as the uterus and gut. Our objective was to determine whether CRF peptide is altered in the brain of rats with endometriosis that received a treatment that targets the CRF receptor type 1. Endometriosis was induced in female rats by suturing uterine horn tissue next to the intestinal mesentery and allowed to progress for 60 days. During the first 7 days after endometriosis induction, rats received intraperitoneal injections of either vehicle (n=4) or a CRF receptor 1 antagonist (n=4) that crosses the blood brain barrier. At time of sacrifice, endometriotic vesicles, uterus and brains were collected. Rats with endometriosis that received the CRF antagonist, showed a decrease in the size and number of endometriotic vesicles. A single labeling immunofluorescence was performed to analyze levels of brain CRF in the dorsal and ventral CA3 region of the hippocampus, and the paraventricular nucleus of the hypothalamus. Preliminary results show similar levels of CRF peptide in both areas of the hippocampus regardless of treatment. However, further studies will continue to be conducted to increase the sample size, evaluate hypothalamic CRF and compare to rats without endometriosis (sham group). Our study will provide information regarding the role of central nervous system CRF in endometriosis progression. Finding alternative treatments for endometriosis will be necessary for combating current therapies that are highly invasive and disrupt the endocrine and reproductive organs. Funding: 1K07AT008027

## SESSION II, POSTER M-14

### DETERMINING THE ROLE OF STRESS MANAGEMENT IN IMPROVING HEALTH OUTCOMES

Florentino Saenz, Hongxing Lu, Preethi Raju, Ednia Gutierrez, Loreanne Tostado, Saraswathy Nair, Dept. of Health and Biomedical Sciences, University of Texas Rio Grande Valley

#### Abstract

Background: Both moderate intensity physical activity (MIPE) and Hatha Yoga (HY) are considered to have benefits in decreasing psychological stresses. However, the influences of MIPE versus HY interventions on stress hormone levels in young adults are still unclear. The purpose of this study is to explore the effect of a MIPE and HY intervention on psychological stress and stress biomarkers (salivary cortisol) in college students. Methods: A total 18 college students were recruited for six-week psychological stress management intervention. The subjects randomly enrolled in either MIPE or HY section. At pre- and post-intervention, body weight, height, waist circumference, and blood pressure were measured. The psychological stress status was determined with the Perceived Stress Scale (PSS) 10 items and the Trier Social Stress Test (TSST) which was administered before and after intervention. The salivary samples were collected and were used to analyze the concentrations of cortisol (morning, night and TSST-related). Results: The morning salivary cortisol value was positively associated with body mass index before ( $R^2=0.48$ ,  $p<0.05$ ) and after both MIPE and HY intervention ( $R^2=0.32$ ,  $p<0.05$ ). After both Physical Exercise (MIPE) and Hatha Yoga (HY) intervention, body weight, and salivary cortisol (morning and night) were not significantly different. The PSS scale was 25% and 5% reduced in HY group ( $p=0.057$ ) and MIPE group ( $p>0.10$ ), respectively. The changes of salivary cortisol during TSST were greatly improved after HY intervention ( $p<0.05$ ), but the improvements of TSST-related salivary cortisol were not observed in MIPE group ( $p>0.05$ ). Conclusion: Hatha Yoga may have beneficial effects on prompting hormonal stress response without significant changes in body weight and psychological stress (PSS scale) in college students.

## SESSION II, POSTER M-15

### A SUMMARY OF HEALTH CONCERNS IN PATIENTS RECEIVING CARE ON THE UNIMOVIL, A MOBILE HEALTH CLINIC IN THE RIO GRANDE VALLEY

Jacob Smith1, Stephanie Leal1, Linda Nelson, RN, MSN1, Vincent Diego, PhD1, Eron Manusov, MD1 1University of Texas Rio Grande Valley School of Medicine, Edinburg, TX

#### ABSTRACT

The Colonias of the Rio Grande Valley (RGV) represent a population that is economically disadvantaged and medically underserved. Colonias are unincorporated residential areas along the Texas-Mexico border that lack basic living necessities, such as potable water, sewer systems, electricity, paved roads, and safe and sanitary housing. Our report estimates the prevalence of several health conditions in patients on the Unimóvil, a mobile medical clinic that serves several Colonias in the LRGV, from Rio Grande City to Cameron Park. Health assessments were based on personal and family medical histories taken by health care professionals, metabolic and lipid panels established from blood samples, and patient questionnaires, specifically patient health questionnaire-9 (PHQ-9). We report current cross-sectional demographic information collected over 18 months from January 2016 to June 2017. Patients receiving care on the Unimóvil (n=1094) have an average age of 38.6 (range 1-89), with females representing the majority of patients (66.5%). Prevalence of selected health conditions are as follows: diabetes (12.9% based on HbA1C  $\geq 6.5\%$ ); hypertension (27.8% based on systolic BP  $\geq 140$  or diastolic BP  $\geq 90$ ); obesity (39.8% based on BMI  $\geq 30$ ); and depression (14.3% with at least moderate levels of depression by PHQ-9). The information gathered identifies areas of health concern that predominate in the Colonias, and will help to allocate resources to the treatment and management of conditions with highest rates across individuals in these medically underserved areas in the RGV. Funding for this project provided by United Health Foundation Grant 450000592.

## SESSION II, POSTER M-16

### THE EFFECT OF VALPROIC ACID PRENATAL EXPOSURE ON THE NEURODEVELOPMENT OF CHICKEN EMBRYOS

Ramiro Tovar III, Xiaolian Fang, Ph.D., The University of Texas Rio Grande Valley, School of Medicine

#### ABSTRACT

Valproic acid (VPA) is one of the most commonly used antiepileptic drugs. It is also a teratogen that causes birth defects in humans, including neural and neurobehavioral abnormalities in the offspring. However, the underlying molecular mechanisms of these defects remain unclear. N-methyl-D-Aspartate receptor (NMDAR) is one type of glutamate excitatory receptors and is involved in normal neurodevelopment, learning, and memory formation. VPA intervenes in rat synapse formation and suppresses NMDAR-mediated neural response. We aimed to investigate if and how NMDARs play a role in VPA-induced neurodevelopmental anomalies. This study was carried out in fertile White Leghorn chicken eggs. VPA was injected in different dosages (100  $\mu\text{g}$  to 500  $\mu\text{g}$ ) into chicken embryos at stage HH4 before the process of neurulation occurred. Embryo development, embryo growth and brain NMDAR expression were analyzed in eggs incubated for 12 days. Our data showed that prenatal exposure of VPA causes failure of embryo development and embryo growth restriction, which are dosage-dependent. NMDARs expression was studied in forebrain of chicken embryos and NMDAR expression increase was found in VPA-treated groups. The potential role of NMDARs in the neurodevelopment of chicken embryos will be further studied. And the present findings highlighted that the birth defect model created in this study could be used to test the hypotheses causing birth defects as well as investigate appropriate preventative strategies.

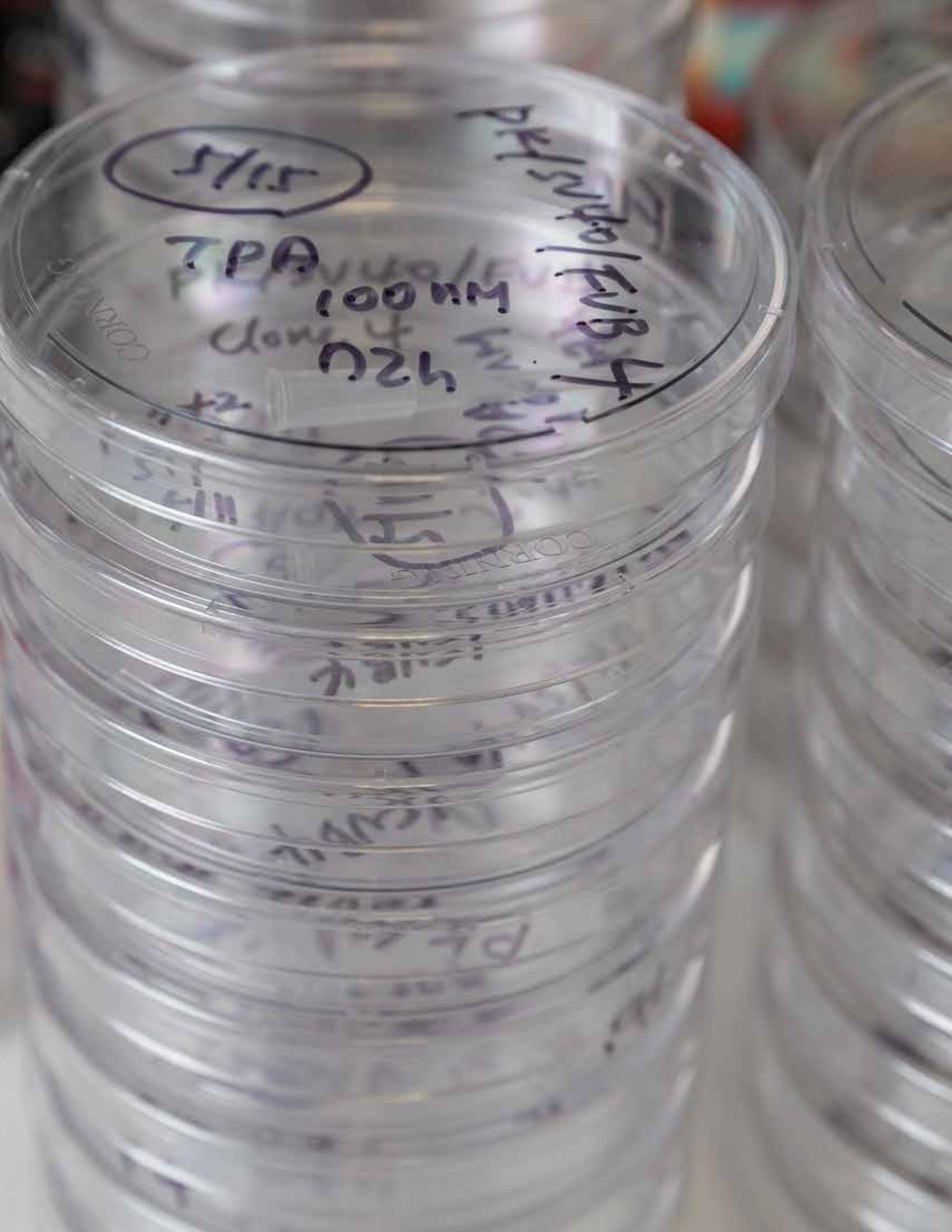
## SESSION II, POSTER M-17

### COMORBID DEPRESSIVE SYMPTOMS AND SELF-ESTEEM IMPROVE AFTER EITHER COGNITIVE-BEHAVIORAL THERAPY OR FAMILY-BASED TREATMENT FOR ADOLESCENT BULIMIA NERVOSA

Fabiola Valenzuela1, James Lock1, Daniel Le Grange2,3, Cara Bohon1 1Department of Psychiatry and Behavioral Sciences, Stanford University School of Medicine, Stanford, California, USA 2Department of Psychiatry, University of California, San Francisco, California, USA 3Department of Psychiatry and Behavioral Neuroscience, The University of Chicago, Chicago, IL, USA (Emeritus)

#### ABSTRACT

Objective: To examine the effect of Family-Based Treatment for adolescent BN (FBT-BN) and Cognitive Behavioral Therapy for Adolescents (CBT-A) on change in depressive symptoms and self-esteem in adolescents with bulimia nervosa. Method: Data were collected from 110 adolescents, ages 12 to 18, recruited from The University of Chicago and Stanford University who met DSM-IV-TR criteria for BN or partial BN. Participants were randomly assigned to FBT-BN or CBT-A and completed measures of depressive symptoms and self-esteem before and after treatment and at 6-month and 12-month follow-up assessments. Results: Results revealed that depressive symptoms and self-esteem significantly improved in both CBT-A and FBT-BN, and neither treatment appeared to be superior to the other on these secondary clinical outcomes. Discussion: Although FBT-BN has demonstrated greater remission rates for adolescent BN, parents often worry whether the treatment also addresses comorbid depressive symptoms and low self-esteem. Our findings are important in addressing this concern, as they demonstrate that FBT-BN does not differ from CBT-A in improving depressive symptoms and self-esteem, and that both treatments result in symptom improvement. These findings can help clinicians guide families in choosing a treatment that successfully addresses both BN and depressive symptoms and low self-esteem. Supported by NIMH grants: R01-MH-079978 and R01-MH-079979



# Medical Resident Category Poster Presentations

## SESSION II, POSTER R-1

### EFFECT OF COMBINATION SGLT2I AND GLP-1RA THERAPY ON GLYCEMIC CONTROL, BODY WEIGHT, AND BETA-CELL FUNCTION IN TYPE 2 DIABETIC (T2D) SUBJECTS

Hussein Al Jobori MD, John Adams MS, Curtis Triplitt PhD, Ralph DeFronzo MD, Eugenio, Cersosimo MD - The University of Texas Health Science Center at San Antonio, San Antonio, Texas.

#### ABSTRACT

To examine whether SGLT2 inhibition plus GLP-1RA combination therapy provides superior clinical and metabolic benefits compared to monotherapy with each agent, we randomized 24 inadequately controlled ( $A1c = 8.2 \pm 0.2\%$ ) T2D patients (treated with MET or MET/SU) to receive either canagliflozin (300 mg/d; n=8, CANA), liraglutide (1.8 mg/d; n=8, LIRA) or both (n=8, COMBO). Baseline characteristics were similar across all groups. After a baseline OGTT and clinical measurements (systolic blood pressure [SBP], body weight [BW], A1c & fasting plasma glucose [FPG]) a 16-wk treatment period was started. Clinical parameters & OGTT were repeated at study end. Matsuda [MI]\* for insulin sensitivity, insulinogenic index [DI/DG] & insulin secretion/insulin resistance [disposition] index [IS/IR= $\Delta I/\Delta G \times MI^*$ ] were calculated. LIRA CANA COMBO p-value Combination therapy with canagliflozin and liraglutide provides a greater than additive effect on body weight and systolic blood pressure and an additive effect on glycemic control and beta cell function. These findings provide a strong rationale for the use of combined SGLT2i/GLP-1 RA therapy in poorly controlled T2D patients

## SESSION II, POSTER R-2

### EMPAGLIFLOZIN IMPROVES BETA CELL FUNCTION MEASURED WITH THE HYPERGLYCEMIC CLAMP IN T2DM

Hussein Al Jobori, The University of Texas Rio Grande Valley DHR Graduate Medical Education Program

#### ABSTRACT

AIM: To examine whether lowering the plasma glucose concentration for 2 weeks with empagliflozin (SGLT2 inhibitor) improves beta cell function in T2DM. Research Design and Methods: 15 T2DM patients received empagliflozin (25 mg/day) for 2 weeks, and beta cell function was measured with a 9-step hyperglycemic clamp (each step = +40 mg/dl) before and at 1 and 14 days after the start of empagliflozin. Results: Empagliflozin caused  $101 \pm 10$  and  $117 \pm 11$  grams glucosuria on days 1 and 14 and produced a 25 and 38 mg/dl reduction ( $p < 0.05$  for both) in the fasting plasma glucose (FPG) concentration, respectively. Empagliflozin caused 48% and 70% increase in the incremental area under the plasma C-Peptide concentration curve during the stepped hyperglycemic clamp on days 1 and 14. Empagliflozin caused an increase in the glucose infusion rate during the hyperglycemic clamp at days 1 and 14 compared to baseline by 15% ( $P < 0.05$ ) and 16% ( $p < 0.05$ ), respectively. Beta cell function, measured as the insulin secretion/insulin resistance (IS/IR) index, increased by 76% and 100% (both  $p < 0.05$  vs baseline) at days 1 and 14, respectively, versus baseline. Empagliflozin also caused a significant increase in beta cell glucose sensitivity during the hyperglycemic clamp by 42% and 54% at days 1 and 14 compared to baseline. Conclusion: Lowering the plasma glucose concentration with empagliflozin in T2DM patients: (1) enhances tissue glucose uptake during combined hyperinsulinemic/hyperglycemic conditions, (2) augments beta cell glucose sensitivity; (3) improves beta cell function (IS/IR index).

## SESSION II, POSTER R-3

### INFLAMMATORY RESPONSE REGULATOR TREATMENT IN ACUTE SECOND DEGREE PARTIAL DEPTH BURN WOUNDS

Jose Cano, MD1,2,4, Climaco Cano PharmD 3, Heidi Pareja, MD4 1-Hospital Central de Los Institutos Venezolanos de Seguros Sociales "Dr Miguel Perez Carreño", Caracas, Venezuela 2-Plastic and Reconstructive Surgery Program, Universidad Central de Venezuela, Caracas, Venezuela 3-Metabolic and Endocrine Research Center "Dr. Felix Gomez", Universidad de Zulia, Maracaibo, Venezuela 4-University of Texas Rio Grande Valley, McAllen, TX

#### ABSTRACT

Skin burns have a high incidence in patients within the active workforce. Released oxidant and arachidonic acid metabolites and cytokines result in the early generalized inflammatory response, which have a vicious cycle that amplifies the inflammation. This prolongs wound healing time and worsens wound depth, resulting in extent in treatment and costs. Objective: Regulating inflammation using high concentration polyphenols. Methods: Topical high concentration phenols were used on 11 patients with second degree partial-thickness deep burn wounds. The investigator followed patients and used software and hardware Silhouette Connect and Silhouette Star for macroscopic measurements. Results: An average of 54.6% area healed after the 4th day of treatment; 82.71% after the 8th day; and 95.1 % after the 12th day. Conclusions: High concentration phenols (hydroxytyrosol, tyrosol, oleuropein, 1-acetoxypinoresinol and pinoresinol) were used due to their high known anti-oxidant properties in burn pathophysiology. Phenols are mono-unsaturated fatty acids that restore membrane cell selectivity preventing further damage and also have antimicrobial properties. The results of this project were promising: the ability to reduce wound healing period using a topical treatment that could regulate inflammatory response is innovative, practical and reproducible. Future direction: The inclusion of population with diseases that have altered inflammatory responses (patients with diabetes mellitus, chronic kidney disease, and autoimmune disease), would allow a more detailed description of inflammatory pathophysiology and possible benefit of using topical high concentration phenols for wound healing.

## **SESSION II, POSTER R-4**

### **WHAT'S IN THE URINE BAG? A CASE OF PURPLE URINE BAG SYNDROME**

*Ivashchuk Galyna, Department of Internal Medicine, The University of Texas Rio Grande Valley School of Medicine*

#### **ABSTRACT**

Introduction: Purple urine bag syndrome (PUBS), is a phenomenon in which purple discoloration of the urinary drainage bag manifests following long-term urinary catheterization. Case: Patient is a 69 year old woman with breast cancer on chemotherapy and bed-bound due to dementia presented for cough and shortness of breath for 3 days. Subsequently, she was admitted for treatment of community-acquired pneumonia. Due to her bed bound status, foley catheter was placed. During second day of admission, the urinary bag was found to have purple discoloration with clear urine present in the bag. Urinalysis was significant for alkaline urine with a pH of 8. No bacterial growth was found in urine culture. Although urine bag was replaced, subsequent bags developed purple staining. Discussion: PUBS, although a rare phenomenon, has been reported to occur in up to 42% of patients in long term care facilities and is caused by breakdown of amino acid tryptophan by bacteria. Tryptophan is metabolized into indoxyl sulfate following intestinal and hepatic metabolism. Indoxyl sulfate is further divided into indigo (blue) and indirubin (red), which combined in the bag lead to purple discoloration in the presence of bacteria with indoxyl phosphatase/sulfatase activity. Bacteria involved are usually E.Coli, Proteus, Pseudomonas, Enterococcus, Citrobacter, Klebsiella, Morganella, and Providencia. Risk factors for development of PUBS are UTI, elderly women, constipation, CKD and alkaline urine. Although most cases appear to be harmless, there have been reports of complications including development of Fournier's gangrene. This phenomenon usually resolves with administration of antibiotics, or spontaneously. Appearance of PUBS should prompt evaluation for urinary tract infection. Medical care should include improvement in intestinal motility, urinary hygiene and changing urinary catheters.

## **SESSION II, POSTER R-5**

### **A CASE OF UNUSUAL HYPOXEMIA: ACQUIRED METHEMOGLOBINEMIA SECONDARY TO PHENAZOPYRIDINE USE**

*Sunil Kamnani, Graduate Medical Education Resident, The University of Texas Rio Grande Valley, School of Medicine, Internal Medicine*

#### **ABSTRACT**

Acquired methemoglobinemia secondary to Phenazopyridine use is a rare side effect that has been documented in literature. This case highlights salient features of this condition and a discussion of prior case report findings. Case: An 87-year-old woman sent to the ED with unexplained hypoxemia, generalized body weakness, and shortness of breath. During assessment for a colonoscopy that day, she was noted to have an oxygen saturation of 88%. Symptoms began 1 day prior to admission. She was recently started on phenazopyridine for urinary dysuria ten days prior. On physical exam, patient appeared pale with a bluish discoloration around the lips. She had an elevated methemoglobin level at 18.4% on arterial blood gas, troponin of 0.73ng/ml, creatinine 2.9mg/dl, and blood urea nitrogen level of 144mg/dl. Patient was given methylene blue and supplemental oxygen, with gradual improvement of hypoxemia. Patient's overall hospital stay was complicated by cardiac demand ischemia, acute kidney injury, and bowel obstruction, likely correlated with initial tissue hypoxia due to methemoglobinemia. Despite this, she was managed medically and surgically and discharged for follow up. Discussion: Phenazopyridine is a commonly used over the counter urinary analgesic. It is a rare cause of acquired methemoglobinemia, with only a few cases reported in literature. Patients can present with skin discoloration, such as pale or blue/gray coloration to lips, skin, nails, and sclera. Some present with shortness of breath, which is resolved after treatment with methylene blue. Clinical findings include low pulse oximetry reading with incomplete response to supplemental oxygen therapy. Arterial blood gases do not show hypoxemia. Patients recover within 1-3 days of treatment with administration of methylene blue and removal of trigger.

## **SESSION II, POSTER R-6**

### **DIABETIC CARE IMPROVEMENT INITIATIVE THROUGH THE LEARNING/TEACHING OF QUALITY IMPROVEMENT METHODS**

*Charles Ike Austin, M.D., Sunand Kallumadanda, M.D., Angel Lamas, M.D., Zeeshan Afzal, M.D., Roman Kuznetsov, M.D., Fafael Fontirroche, M.D., Jesus Garza-Tamez, M.D., Marivel Barrera, Clinic Director for McAllen Medicine Residency Program at Mcalle, Texas. The University of Texas Rio Grande Valley.*

#### **Abstract**

Medical education is changing at both the undergraduate and graduate levels with new methods being introduced and taught to provide the learner with skills needed for lifelong learning with the ultimate goal of improving the care provided to our patients. The skills learned in scholarly research and quality improvement are essential in dealing with the increasing complexity of providing medical care. Family medicine physicians are well suited to benefit from learning these skills. OBJECTIVE: This study was undertaken for the purpose of improving diabetic care in our population of patients. Diabetes is serious disease and has a high prevalence in our patients. The process, skills, and methods of quality improvement were thought and learned during this study. DESIGN/PATIENTS/INTERVENTION: The researchers were able to determine that there was substantial opportunity for improvement after reviewing baseline data collected from 126 diabetic patient charts. The research team studied the problem and suggested several interventions to improve care. The implementation of standardized work with a checklist as the primary interventions for improvement yielded dramatic results. The Plan Do Study Act approach to improvement was utilized to conduct our study. Both descriptive and inferential statistical methods were used to support conclusions. The methods used demonstrated the resourcefulness of the research team in overcoming obstacles to success. OUTCOME/RESULTS/CONCLUSION: The goal of improving compliance in meeting diabetic care guidelines were

accomplished and supported by the study. The simple implementation of a checklist dramatically improved care provided. The importance of scholarly work in teaching family medicine residents was strongly accepted by our residents and faculty as a result of their participation in this quality improvement research. Working with data collection and the participation in this team effort was instrumental in the researcher/learner buy in. Efforts to sustain the project beneficial effects with the use of the checklist have been successful.

## **SESSION II, POSTER R-7**

### **DILATED CARDIOMYOPATHY IN A YOUNG WOMAN WITH ECTOPIC PREGNANCY**

*Sina Najafi, Carlos Morales, MD., Graduate Medical Education Resident, The University of Texas Rio Grande Valley, School of Medicine*

#### **ABSTRACT**

Introduction: Dilated cardiomyopathy (DCM) is characterized by dilation and impaired contraction of one or both ventricles, which affects systolic function. Late stage pregnancy is one the reported causes of cardiomyopathy. This case demonstrates a young woman with ectopic pregnancy who developed dilated cardiomyopathy after surgical intervention. Case: Patient is a 20 year-old female G2 P1 who presented to ED for right lower quadrant abdominal pain and positive home pregnancy test. Patient was found to have a right ruptured fallopian tube consistent with ectopic pregnancy. She underwent diagnostic laparoscopy with right salpingectomy. Patient was found to be persistently hypotensive after the procedure despite minimal blood loss. Subsequently she was found to have elevated troponin levels with no ST or T wave changes on EKG. Echocardiogram revealed dilated cardiomyopathy with a reduced ejection fraction (EF). Heart catheterization established mild anterior hypokinesis, and mild elevation of pulmonary artery pressure with no evidence of CAD. Patient's hospital stay required intensive care management for stabilization of clinical condition. She was discharged from the hospital with beta-blocker therapy. Her repeat echo 2 weeks after discharge revealed normal left ventricle size with normal EF with mild mitral and trace tricuspid regurgitation. Discussion: Dilated cardiomyopathy may have idiopathic, ischemic, or nonischemic causes. This case demonstrates an interesting finding of dilated cardiomyopathy which may have been due to a stressful event such as an ectopic pregnancy. Pregnancy induced cardiomyopathy was originally diagnosed on last trimester or after delivery; however, few cases have been reported before 28 weeks. We cannot exclude the possibility of this diagnosis in our patient. This demonstrates that to determine the true causative factor of cardiomyopathy remains an elusive diagnostic challenge.

## **SESSION II, POSTER R-8**

### **KEEP YOUR EYES WIDE OPEN WHEN YOUR PATIENT EYES ARE WIDE SHUT**

*Juan J. Menjivar MD1, Carlos A. Paris MD2, Juan Castaño MD3, Timothy Heath MD4 1,2,3 University of Texas Rio Grande Valley-Doctors Hospital at Renaissance Internal Medicine residents. 4 University of Texas Rio Grande Valley-Doctors Hospital at Renaissance Internal Medicine core faculty.*

#### **ABSTRACT**

Introduction: Horner syndrome is a well-known neurological syndrome that includes signs of ptosis, miosis, and anhidrosis, is also called oculosympathetic paresis and is caused by a lesion anywhere in the sympathetic pathway that supplies the head, eye, and neck; lesions affecting the neck are usually compromising the second and/or third neurons of this pathway originated in the hypothalamus. The syndrome is usually unilateral and there are few reports of bilateral involvement, we hope our case will enrich this unusual presentation. Here we present a case of Bilateral Horner Syndrome secondary to bilateral lymph nodes metastasis due to Squamous Cell Carcinoma of the lower esophagus. Case description: The patient is a 48 year-old man, former smoker of 1 pack of cigarettes a day for 20 years with no other medical history, whom started to have symptoms of dysphagia to solids, odynophagia and 25 lbs. weight loss 6 months before he consulted a Gastroenterologist. An EGD showed an obstructive mass occluding the lower esophagus and biopsy of the mass reported a Squamous Cell Carcinoma; he started chemotherapy but his dysphagia progressed to liquids, and then he was sent to the hospital for a PEG tube placement. During his hospitalization he started developing bilateral weakness of both eyelids(LT>RT) associated with diplopia. On physical exam he had pupils size of 2 mm bilaterally with pupillary dilation lag, droopy eyelid LT>RT and multiple adenopathies in the neck bilaterally in segments II-III-IV and V bilaterally. A CT of the neck showed the marked enlarged lymph nodes compressing the carotid arteries and therefore the sympathetic trunk just posterior to the carotid sheath. Patient was subsequently discharge home with his PEG tube placed. Few months after, he passed away. Images: Will add 8 images demonstrating the case in the actual poster. Discussion: This case illustrates the rare presentation of bilateral Horner Syndrome secondary to esophageal metastasis. The pupillary size is governed by 2 opposing forces, the sympathetic and parasympathetic nerve fibers. The constriction to light and near stimuli is mediated via parasympathetic (cholinergic) nerve fibers that travel along the third cranial nerve. Dilation is mediated through three-neuron sympathetic (adrenergic) pathways that originate in the hypothalamus. Other factors influencing pupillary size include patient age, emotional state (adrenergic tone), state of arousal, and intraocular pressure. It is important to always have a broad differential on bilateral ptosis patients. The examiner always has to have a high index of clinical suspicion for diagnosis, the confirmatory test is the use of pharmacological agents and also imaging studies. This syndrome is normally unilateral, that is the way we learned it in the medical school, is very infrequent to find it bilaterally, so that opened our eyes to all the different etiologies that this clinical finding of his physical exam could represent.



**SESSION II, POSTER R-9**

**THE SAFETY OF PULMONOLOGIST PERFORMED SONOGRAPHY-GUIDED THORACENTESIS IN THE OFFICE SETTING**

*Grigoriy Rapoport, Adolfo Kaplan, M.D., Graduate Medical Education Resident, The University of Texas Rio Grande Valley, School of Medicine*

**ABSTRACT**

Pleural effusions are commonly encountered and their characterization key for clinical management. The purpose of this study is to examine the safety of ultrasound guided thoracentesis by pulmonologists in an office setting. We conducted a retrospective chart review of patients undergoing thoracentesis between January 1st 2014 and December 31st 2016 in a pulmonary practice. All procedures were performed with sonographic guidance utilizing a 3.5 MHz probe and Sonosite Titan equipment. Only Arrow thoracentesis kits were utilized. Pleural fluid was drained by gravity. Vitals signs were recorded prior to and after interventions. Pleural drainage was stopped at the discretion of the proceduralist. Chest sonography was utilized to rule out pneumothorax after intervention. In total, 190 thoracenteses were performed on 100 patients (60 males, 40 females). Age ranged between 42 to 100 years. Indications included decompensated heart failure (n=36, 75 procedures), post CABG effusions (n=9, 20 procedures), effusions associated with renal failure (n=11, 26 procedures), liver cirrhosis (n=7, 11 procedures), pulmonary hypertension (n=6, 10 procedures), malignancies (n=19, 25 procedures), and miscellaneous. Total fluid removed ranged from 250 to 2,000 mL, average 1,153 mL. Complications: cough (13%), chest pain (4%), dyspnea (0.05%). No hypotension, vasovagal reaction, pneumothorax or bleeding occurred. We demonstrate the safety of ultrasound-guided thoracentesis as part of regular services in a busy office setting, and support the use of chest sonography to rule out pneumothorax after intervention. We confirm the safety of large volume pleural drainage in high-risk patients using our approach. No increase in complications was noted based on volume of fluid removed and incidence of pain and cough compared with current literature. No pneumothoraces were identified. Sonographic-guided thoracentesis is safe, preferred by patients, cost-effective, and feasible in a busy clinical setting as performed by trained pulmonologists.

**SESSION II, POSTER R-10**

**MURINE TYPHUS: A RISING CAUSE OF FEBRILE ILLNESS IN SOUTH TEXAS**

**WITH POTENTIAL FOR SERIOUS COMPLICATIONS**

*Zeeshan Afzal 1, MD, Sunand kallumadanda 1, MD, Feng Wang 1, MD, Maria del C Colon-Gonzalez 1, MD, Vagish Hemmige 2, MD, Daniel Musher 2,3, MD 1. McAllen Family Medicine Residency Program, University of Texas Rio Grande Valley, McAllen, TX, 78503 2. Department of Medicine (Infectious Disease Section), Baylor College of Medicine, Houston, TX, 77030 3. Medical Care Line, Infectious Disease Section, M.E. DeBakey VA Medical Center, Houston, TX, 77030*

**ABSTRACT**

Murine typhus is reemerging, especially in Texas, however most cases are not promptly recognized. Report a comparison of epidemiology, clinical manifestations, and potential complications of murine typhus between pediatric and adult patients in the Rio Grande Valley. Design: A retrospective chart review was conducted of electronic medical records of patients admitted in 2 hospitals of the Hidalgo County, TX who had positive typhus serology (titer  $\geq 1:64$ ) between the years 2013-2016. Setting: All patients who were admitted to a community hospital. Participants: 107 patients were identified with endemic typhus based on serology. 96 of them were included in the study based on clinical presentation, supportive laboratory findings and elevated IgM titers. 11 cases were excluded due to presence of concurrent infection or incomplete medical records. Most patients lacked significant comorbidities and all were immunocompetent. Results: The majority presented with typical typhus: fever, headache, myalgias and fatigue. Rash, low platelet count, low albumin and elevated liver enzymes were frequent. Median duration from onset of illness to hospitalization was 7 days (ranging up to 21 days) and median number of days between initial clinical encounter and administration of definite antimicrobial therapy was 5 days (ranging up to 15 days). Complications occurred in 26% of cases, caused a less typical syndrome, including bronchiolitis, pneumonia, pancreatitis, cholecystitis, myositis, rhabdomyolysis, meningitis and septic shock. Procalcitonin was  $\geq 0.5$  in 71% of cases. All patients were treated with doxycycline with a rapid response; fever generally disappeared within 24-36 hours of the first dose. Conclusion Murine typhus is a common endemic infection in South Texas and continues to rise. Although most patients have a typical syndrome, it is frequently overlooked as a cause of acute febrile illness. Prompt recognition can prevent complications which occur in one-fourth of patients.

**SESSION II, POSTER R-11**

**IN A BIND: TRANSAMINITIS IN A TRANSGENDER WOMAN**

*Kara Zabelny, DO2, Michelle Cordoba-Kissee, MD22*

*1 University of Texas Rio Grande Valley School of Medicine, Edinburg, Texas; 2 University of Texas Rio Grande Valley-Doctors Hospital at Renaissance Internal Medicine Residency, Edinburg, Texas*

**ABSTRACT**

Underserved patient populations such as the transgender community have unique healthcare needs that have yet to be discussed in medical literature. The desire to outwardly express their gender identity and avoid harassment may lead transgender people to pursue non-conventional methods to achieve their preferred appearance. Understanding these practices can give insight into the patient's overall well-being. An 18 year old male to female transgender woman presented for hormone replacement therapy. The patient had no prior medical history, was currently taking no medications (including hormones), and had no family history of cancer, heart disease, liver disease, or coagulation disorders. She denied alcohol or substance abuse. On exam, she was well-appearing without jaundice. There was no scleral icterus. The abdomen was soft, nondistended, and non-tender. Initial bloodwork prior to hormone use showed no electrolyte abnormalities, but a mild elevation in AST to 88 and ALT to 190 were noted. ALP was 61 with no hyperbilirubinemia. Lipid profile showed triglycerides at 60, total cholesterol 167, LDL 103, and HDL 66. When the lab findings were discussed with her, the patient denied any abdominal pain. However, she stated that she was using a waist trainer to achieve a more feminine figure. She was advised to stop using it for the time being, and repeat lab work showed resolution of the transaminitis as well as a negative viral hepatitis panel. While this case highlights a transient and benign increase in transaminases, the etiology of these abnormal lab results could be considered in persons pursuing hormone therapy. It is unknown how many transgender individuals use waist trainers to achieve a particular figure and what impact those waist trainers may have on a patient's general health. Therefore, further research should be done to learn more about waist training practices, including its prevalence in transgender women and if there are any long term adverse effects.



# Post Doctoral/Fellows Category Poster Presentations

## SESSION II, POSTER P-1

### ACANTHOSIS NIGRICANS IN TEXAS; WHAT CLAIM DATA CAN TELL US?

Bassent Abdelbary, MD, MPH, PhD1 1 University of Texas Rio Grande Valley, Department of Physician Assistant

#### ABSTRACT

Objective: Acanthosis Nigricans has been linked to obesity, high levels of circulating insulin, and other endocrine disorders especially in children. Acanthosis Nigricans has been used as a quick marker to determine risk for such conditions. This study seeks to quantify the burden of Acanthosis Nigricans over Texas public health regions, note overtime changes and link findings to population census data to account for population level differences. Methods: Aggregate claims data with Acanthosis Nigricans as a reported ICD-9 was retrieved from the border health office at the University of Texas Rio Grande Valley. Data included all Acanthosis Nigricans claims from the year 1999 to 2014 reported to Texas Medicaid. Random effect Poisson regression models were used to detect differences in the number of Acanthosis Nigricans claims between public health regions. Results: The number of claims and members of the Medicaid program with Acanthosis Nigricans increased tremendously between the years 1999 and 2014 with a peak increase starting in 2010. Public health region 11 had the highest number of claims in the state of Texas followed by region three, six and eight. Nonparametric test for trend showed significant increase in the number of claims over the fifteen years ( $p < 0.001$ ). Similar increase was demonstrated for regions three, six, and eight ( $p < 0.001$ ,  $0.001$ , and  $0.002$  respectively). Discussion: Public health region 11 serves a 19-county area in the Rio Grande Valley, border counties in region 11 continues to be one of the poorest areas in the country. The significant increase in number of Medicaid members (0-17 years) with Acanthosis Nigricans claims over time is an alarming fact that needs to be addressed by public health officials.

## SESSION II, POSTER P-2

### EARLY LIFE EXPOSURE TO ENVIRONMENTAL POLLUTANTS AS ASSESSED IN DECIDUOUS TEETH AND CARBIO-METABOLIC RISK IN MEXICAN AMERICAN CHILDREN

FEROZ AKHTAR, South Texas Diabetes and Obesity Institute, The University of Texas Rio Grande Valley, School of Medicine  
Early Life Exposure to Environmental Pollutants as Assessed in Deciduous Teeth and Cardio-metabolic Risk in Mexican American Children Feroz Akhtar1\*, Vidya S. Farook1\*, Rector Arya1, Srinivas Mummidi1, Juan Carlos Lopez-Alvarenga1, Roy G. Resendez1, John Blangero1, David E. Camann2, Suman Challa3, Ravindranath Duggirala1. 1South Texas Diabetes and Obesity Institute, University of Texas Rio Grande Valley, Edinburg, TX; 2Southwest Research Institute, San Antonio, TX; 3University of Texas Health San Antonio, San Antonio, TX; \*equal contribution

#### ABSTRACT

Early life exposure to organic chemicals may influence childhood obesity and associated cardio-metabolic risk, which disproportionately affect minority populations such as Mexican Americans (MAs). However, information on the impact of organic chemicals on cardio-metabolic risk in MA children is limited. Therefore, we conducted a pilot study to assess the extent to which exposure to organic chemicals influence cardio-metabolic traits (CMTs) in children. We recalled 25 children from a previous study and collected 25 deciduous teeth. The chemical analysis of the teeth was performed using established protocols. The target analytes included acetaminophen (APAP), 3,5,6-trichloro-2-pyridinol (TCPy), 2-isopropyl-6-methyl-4-pyrimidinol (IMPY), diethyl phosphate (DEP), N,N-diethyl-m-toluamide (DEET), tris(2-butoxyethyl) phosphate (TBOEP), monoethyl phthalate (MEP), mono-n-butyl phthalate (MnBP), monoisobutyl phthalate (MiBP), monobenzyl phthalate (MBzP), mono-2-ethylhexyl phthalate (MEHP), mono-(2-ethyl-5-carboxypentyl) phthalate (MECPP), mono-(2-ethyl-5-oxohexyl) phthalate (MEOHP), and mono-(2-ethyl-5-hydroxyhexyl) phthalate (MEHP). However, the most frequently detected organic chemicals in the chemical analysis of the teeth included the following: APAP, DEET, MnBP, MiBP, and MEHP. These five analytes were considered for association analysis with the selected CMTs, after adjusting for covariate (age, sex, tooth-type) effects. We found significant ( $p < 0.05$ ) positive correlations between MiBP and the CMTs: fat mass, fasting insulin and Homeostasis model of assessment-insulin resistance (HOMA-IR) along with positive association with number of metabolic syndrome components ( $p < 0.10$ ). MnBP and MEHP exhibited negative correlation with blood pressure measures and triglycerides, respectively. APAP showed strong negative correlation with HDL-C ( $p = 0.009$ ) and positive association with triglycerides ( $p < 0.10$ ). These findings suggest a role for early life exposure to organic chemicals influencing cardio-metabolic risk in MA children.

## SESSION II, POSTER P-3

### TARGETED DISRUPTION OF TC-PTP IN THE PROLIFERATIVE COMPARTMENT AUGMENTS STAT3 AND AKT SIGNALING AND SKIN TUMOR DEVELOPMENT

Minwoo Baek, Department of Biomedical Sciences, The University of Texas Rio Grande Valley.

#### ABSTRACT

Tyrosine phosphorylation is a vital mechanism that contributes to skin carcinogenesis. It is regulated by the counter-activities of protein tyrosine kinases (PTKs) and protein tyrosine phosphatases (PTPs). Here, we report the critical role of T-cell protein tyrosine phosphatase (TC-PTP), encoded by Ptpn2, in chemically-induced skin carcinogenesis via the negative regulation of STAT3 and AKT signaling. Using epidermal specific TC-PTP knockout (K14Cre.Ptpn2<sup>fl/fl</sup>) mice, we demonstrate loss of TC-PTP led to a desensitization to tumor initiator 7,12-dimethylbenz[a]anthracene (DMBA)-induced apoptosis both in vivo

epidermis and in vitro keratinocytes. TC-PTP deficiency also resulted in a significant increase in epidermal thickness and hyperproliferation following exposure to the tumor promoter, 12-O-tetradecanoylphorbol-13-acetate (TPA). Western blot analysis showed that both phosphorylated STAT3 and phosphorylated AKT expressions were significantly increased in epidermis of TC-PTP-deficient mice compared to control mice following TPA treatment. Inhibition of STAT3 or AKT reversed the effects of TC-PTP deficiency on apoptosis and proliferation. Finally, TC-PTP knockout mice showed a shortened latency of tumorigenesis and significantly increased numbers of tumors during two-stage skin carcinogenesis. Our findings reveal that TC-PTP has potential as a novel target for the prevention of skin cancer through its role in the regulation of STAT3 and AKT signaling.

## SESSION II, POSTER P-4

### DEVELOPMENT OF SINGLE DOMAIN ANTIBODIES AGAINST GROWTH HORMONE

Kevin Bermea, MD1, Pavel Lugo PhD, MD2, Alexei F Licea-Navarro, PhD2, Jorge A. I. Ascasio-Martinez, PhD1, Antonio A. Perez-Maya PhD1, Hugo A Barrera-Saldaña, PhD1, 1 Universidad Autónoma de Nuevo Leon, Monterrey, Nuevo León, Mexico; 2 Centro de Investigación Científica y de Educación Superior de Ensenada, Ensenada, Baja California, Mexico.

#### ABSTRACT

Single domain antibodies (sdAb) consist of a single monomeric variable antibody domain from human antibodies' heavy chain (VH), light chain (VL), or variable domain from heavy chain antibodies from camelids (VHH), or cartilaginous fish (VNAR) that are biotechnologically produced in yeast or bacteria. The advantage of these type of antibodies compared with the conventional ones is that they have a more efficient tissue penetration, higher expression biotechnological systems high solubility and thermostability. Our main aim was to apply this technology to develop a sdAb against human growth hormone (hGH). Justification: Although hGH is required for an adequate body developmental, imbalance on hGH production is the basis of three important diseases: acromegaly, gigantism (overproduction), and growth retardation (deficiency). Overproduction of hGH lead to deleterious effects in our body such as insulin resistance, bony deformities, cardiovascular diseases, obstructive sleep apnea, and high risk for developing cancer. Methods: To obtain sdAb against hGH, the phage display technique was performed starting from a naive VNAR library. After that, the clones obtained where sequenced and to characterize the structure and finally expressed on the BL21 E. coli strain. An ELISA was performed to test the target recognition capacity. Results: At the end we found four candidates and one antibody gave a positive signal in the target recognition test. Future directions: The antibody obtained should be more characterized by measuring its affinity, sensibility on immunoassays, and also its ability to block hGH activity. This project was funded by CONACYT.

## SESSION II, POSTER P-5

### UNTANGLING LIPIDS – A PEDIGREE BASED STUDY OF THE PLASMA LIPIDOME THROUGH WHOLE GENOME SEQUENCING TO ASSESS RARE DELETERIOUS VARIANTS IN 1,025 MEXICAN AMERICANS.

Nicholas B. Blackburn1, Juan M. Peralta1,2, Arthur Porto1, Marcio A. Almeida1, Ravi Duggirala1, Harald H. Göring1, David C. Glahn3,4, Peter J. Meikle5, John Blangero1, Joanne E. Curran1. / 1 South Texas Diabetes and Obesity Institute, School of Medicine, University of Texas Rio Grande Valley, TX, USA / 2 Menzies Institute for Medical Research, University of Tasmania, Hobart, Tasmania, Australia / 3 Department of Psychiatry, Yale University School of Medicine, New Haven, CT, USA / 4 Olin Neuropsychiatry Research Center, Institute of Living, Hartford Hospital, Hartford, CT, USA / 5 Baker Heart and Diabetes Institute, Melbourne, Australia

#### ABSTRACT

Circulating lipids such as HDL, cholesterol and triglycerides, are routinely used as clinical tools for monitoring human disease risk. These macro scale lipids are constitutively made up of a structurally diverse complex of simple lipid species collectively known as the lipidome. Using mass spectrometry quantification, lipidomic profiling of human samples is showing these simple lipids influence diseases including major depressive disorder, diabetes and CVD. The genetic basis that drives variation in levels of plasma lipids is relatively unknown and presents an opportunity to understand the genetics of the lipidome and potentially provide new disease insights. We characterized 319 lipid species (from 23 lipid classes and subclasses) in plasma samples from 1,025 Mexican Americans in extended pedigrees, each with whole genome sequence (WGS) data. These pedigrees provide the potential to capture enough copies of rare functional variants to allow specialized variant-specific association analyses. Such an analysis is not possible in large population studies because genetic variants with the largest functional impact are typically rare in the population and do not occur frequently enough in unrelated sample sets for association testing. Our analysis has shown that variation in levels of all 319 lipid species is significantly heritable, ranging from 14%-77% (mean 43%). This means that on average 43% of the variation seen in a lipid level is due to underlying genetic factors. To identify what some of these genetic factors are we used rare, functional coding variants identified in our sample set using WGS to look for associations between variants and lipid levels. We identified multiple rare variants significantly associated with specific lipid species. Variants of specific interest include those of apparent Hispanic origin, LIPC-Q355R, causing large, significant increases (0.57-0.69 SDU) in several phosphatidylethanolamines ( $p = 2.10 \times 10^{-6}$  to  $9.54 \times 10^{-9}$ ) and DEGS1-L175Q, causing large, significant alterations (0.9-1.3 SDU) in ceramides and dihydroceramides ( $p = 2.00 \times 10^{-7}$  to  $1.67 \times 10^{-13}$ ). Our results suggest that WGS in extended pedigrees is useful for the detection of putative functional variants of relevance to the lipidome. Given the large effect sizes of these variants and their apparent Hispanic specificity this study highlights the benefits of studying rare variants in families from different ancestry backgrounds.



**SESSION II, POSTER P-6**

**USE OF GROWTH HORMONE IN POOR RESPONDER PATIENTS FOR IVF CYCLES**

*Cepeda Reyes Alma Delia, Gracia Hernández Irma, Martínez Castañeda Jesús, Canseco Sedano Rodolfo, Ramírez Correa Genaro, Juárez Díaz Behira Liliana, Garza Morales Arturo. Instituto de Ciencias Vida, Matamoros, Tamaulipas, México.*

**ABSTRACT**

Oocyte quality is a key factor in Assisted Reproduction success. Advanced female age before menopause decreases oocyte number and quality. Older patients (37- 45), with elevated FSH, ovarian reserve is diminished, favors cancellation cycles due to poor or null oocyte recovery, poor follicular development and premature ovulation<sup>1</sup>. Growth hormone (GH) present in granulosa cells, plays an important role in ovarian function and oocyte quality. Recent reports shown a significant increase in clinical ongoing pregnancy rate and live births in IVF patients treated with GH<sup>2,3</sup>. Evaluate the effect of GH in two groups poor responders with a diminished ovarian reserve on oocyte quality, embryo development and clinic pregnancy rate. Retrospective study April 2016-2017. We included poor responders patients with embryo transfer. We compared the number of MII oocytes, fertilization rate and embryo development on Day 2-3 in two groups of patients. Group 1 (30-36 years old) and Group 2 (37-44 years old). Each patient received 1 daily unit of GH (8 units, ZAIZEN, Merck) for 25 days previous to the IVF cycle (antagonist, FSH+HMG). Result and Conclusion: Included 87 patients, average age of 38.7 years, cancellation rate 22.9% (n=20), and an average 4.1 oocytes recovered per cycle. Group 1(n=18), MII oocytes = 89.6%, fertilization rate 81.1%, embryos on day 2-3 = 20%, development to blastocyst 80%. Group 2, n = 69, MII oocytes = 86.1%, fertilization rate 71.10%, embryos on day 2-3 = 86%, development to blastocyst stage 14%. The patients in Group 1 had a significantly higher pregnancy rate than the patients in Group 2 (66.7% vs 32%, p=0.025). Younger patients with poor response had higher pregnancy rate than those of older patients, however, since we observed a good pregnancy rate in both groups of age, we conclude that the treatment with GH is a good alternative before egg donation.

**SESSION II, POSTER P-7**

**PROLACTIN INDUCES IL-2 DEPENDENT IN VIVO AND IN VITRO TRAIL EXPRESSION ON NATURAL KILLER CELLS FROM HCV PATIENTS.**

*G Gutierrez1, PhD, D Kershenobich, MD, PhD2, S Mummidi, PhD3, J Hernandez, PhD3., 1HIPAM - UNAM, Hospital General de México, Mexico City, Mexico, 2INCMNZZS, Mexico City, Mexico, 3STDOI, University of Texas Rio Grande Valley, Edinburg, Texas.*

**ABSTRACT**

NK cells (NKC) are a major component of innate immune response to HCV mediating their effects through TRAIL and IFN- $\gamma$  expression. However, their function is diminished in chronic HCV patients. Prolactin is an immunomodulatory hormone which is capable of activating NKC. However, it is not known if prolactin can activate NKC from HCV patients. Methods. We have conducted a proof-of-concept study and treated twelve chronic HCV patients with Levosulpiride [25mg tid] plus Cimetidine [600mg bid] for 15 days to increase serum prolactin in Hospital General de Mexico. We measured TRAIL and NKG2D expression on peripheral blood NKC, as well as 27-cytokine and chemokine serum profile, viral load, and liver function. We also evaluated in vitro effects of prolactin or/and IL-2 on NKC IFN- $\gamma$  secretion and their TRAIL or NKG2D expression on stimulated peripheral blood mononuclear cells. Statistical tests included T-test, ANOVA and principal component analysis (PCA). Results. Levosulpiride/Cimetidine treatment induced mild hyperprolactinaemia and increased TRAIL on NKC and serum IL-1ra, IL-2, PDGF, and IFN- $\gamma$ . Six patients showed decreased viral loads with increased IL-2 levels. PCA showed that IL-2 and TRAIL are in the same PC and together explained viral load decrease (p=0.028). The in vitro study revealed that prolactin plus IL-2 synergized to increase TRAIL and NKG2D only in HCV+ patients. Conclusions. Levosulpiride/Cimetidine treatment induced mild hyperprolactinaemia associated with NK activation and Th1-type cytokine profile. Also, increased TRAIL and IL-2 increase is associated with viral load decrease. Prolactin could be used to increase the NK activation in HCV+ subjects.

**SESSION II, POSTER P-8**

**ARTHRITIS RHEUMATOID-INDUCED JOINT PAIN AND BONE LOSS ARE EXACERBATED IN MICE WITH OBESITY**

*Juan Miguel Jiménez Andrade, Autonomous University of Tamaulipas*

**ABSTRACT**

Objective: Our aim was to quantify nociceptive spontaneous behaviors, knee edema, proinflammatory cytokines, bone density, and microarchitecture in high-fat diet (HFD)-fed mice with unilateral knee arthritis. Methods: ICR male mice were fed either standard diet (SD) or HFD starting at 3 weeks old. At 17 weeks, HFD and SD mice received intra-articular injections either with Complete Freund's Adjuvant (CFA) or saline into the right knee joint every 7 days for 4 weeks. Spontaneous pain-like behaviors and knee edema were assessed for 26 days. At day 26 post-first CFA injection, serum levels of IL-1b, IL-6, and RANKL were measured by ELISA, and microcomputed tomography analysis of knee joints was performed. Results: HFD-fed mice injected with CFA showed greater spontaneous pain-like behaviors of the affected extremity as well as a decrease in the weight-bearing index compared to SD-fed mice injected with CFA. Knee edema was not significantly different between diets. HFD significantly exacerbated arthritis-induced bone loss at the distal femoral metaphysis but had no effect on femoral diaphyseal cortical bone. HFD did not modify serum levels of proinflammatory cytokines. Conclusions: HFD exacerbates pain-like behaviors and significantly increases the magnitude of periarticular trabecular bone loss in a murine model of unilateral arthritis. This work was supported by the Mexican National Council of Science and Technology[CB-2014 240829, INFR-2016 270549]; Autonomous University of Tamaulipas [PFI 2016-34].





# High School Category Poster Presentation

## SESSION II, POSTER H-1

- *Leslie De la Pena – Undergraduate Research Assistant*
- *Jose Alejandro – La Joya ISD*
- *Adrian Suarez – La Joya ISD*
- *Eliseo Moreno – La Joya ISD*
- *Cyrus Torres – PSJA ISD*

Three groups of students participated in a summer research project in which they identified and characterized strains of *Bacillus thuringiensis* (Bt) as an organic pesticide. This group will be presenting on the results of the morphological analysis that was conducted to identify Bt. What follows is the high school students' summary of their 6-week research project. Our objective was to be able to find new strains of *Bacillus thuringiensis* (Bt). Bt is a soil dwelling bacterium, when Bt is sporulated it produces a crystal (cry) protein that can kill insects. Not all Bt found in the soil can produce this cry protein, making our research challenging. We obtained eight samples in total, from campus and home. Bt colonies were stained with Coomassie Blue and examined under a light microscope at a 100x magnification. Positive strains were identified based on the presence of protein crystals. The identified strains were then tested on mosquito larvae. We tested Bt samples on mosquito larvae to determine if it will kill mosquito larvae. The results of this bioassay are presented separately.

## SESSION II, POSTER H-2

- *Khristopher Hirschmann – Undergraduate Research Assistant*
- *Illuvia Garcia - La Joya ISD*
- *Alejandro Ibarra – La Joya ISD*
- *Alejandro Herrera – La Joya ISD*
- *David Silva – PSJA ISD*

Three groups of students participated in a summer research project in which they identified and characterized strains of *Bacillus thuringiensis* (Bt) as an organic pesticide. This group will be presenting results of the bioassays that assessed the effectiveness of the identified Bt. What follows is the students' summary of their 6-week research project. The cry protein is produced by a bacterium called *Bacillus thuringiensis*, known as a pesticide. This bacterium was first discovered in ancient Egypt with spores as evidence of their existence. As time passed, Japanese biologist Shigetane Ishiwatari isolated the Bt while investigating silk worms and named it *Bacillus Sototo*. A decade later Ernst Berliner isolated the bacterium while working on the Mediterranean flour moth, and changed the name into what we now know as *Bacillus thuringiensis*. A defining feature of Bt is its ability to sporulate and produce the cry proteins. Like any other organism Bt has a defensive mechanism - by sporulating itself and forming the cry proteins, though this only happens when the bacterium is in extreme conditions. In this experiment we used locally collected samples and positive control Bt provided for us. The results were not as expected. From the samples identified, none displayed pesticidal properties, although we did witness the strains toxic power in the positive control sample. Though we did not have success in one way we continued our research using the positive control, and found a lethal dose response needed to kill mosquito larvae. Based on the results of our experiment, we were able to identify novel strains of Bt, but did not in fact carry any pesticidal properties. Molecular Characterization of *Bacillus Thuringiensis*

## SESSION II, POSTER H-3

- *Felicia Rodriguez – Undergraduate Research Assistant*
- *Emmanuel Matamoros - La Joya ISD*
- *Jonathan Garcia - La Joya ISD*
- *Roberto Perez – PSJA ISD*
- *Sebastian Segovia – La Joya ISD*

Three groups of students participated in a summer research project in which they identified and characterized strains of *Bacillus thuringiensis* (Bt) as an organic pesticide. This group will present findings from the molecular characterization of Bt, including protein and DNA analysis. What follows is the high school students' summary of their 6-week long research project. *Bacillus thuringiensis* is a bacteria found around the world and has pesticidal properties. Bt toxin strains have the capacity to annihilate pests. It's used on crops to kill pests like the potato beetle, but without harmful chemicals. Also, it's beneficial because it can kill mosquitos that transmit diseases or viruses that will affect us, such as the "Zika" virus. We have been identifying strains of Bt that have the crystal (cry) protein. We collected soil samples from different locations (UTRGV campus and home). The soils were screened for new strains of Bt. Positive strains of Bt were confirmed by the presence of the crystal (cry) protein from SDS-PAGE and DNA analysis. Some identified strains had the protein crystal but didn't have pesticidal properties against mosquito larvae. We then conducted an experiment to test the difference in efficiency between our soil samples and the positive control. Our soil sample didn't exterminate mosquito larvae. We tested the larvae by placing them in the petri dishes with the positive control. Although all samples contained protein crystals, the only one that was able to eliminate the mosquito larvae was *Bacillus thuringiensis israeliensis*. The other two, which were negative controls, were *Bacillus thuringiensis tenebriones* and *Bacillus thuringiensis HD1*. The negative controls had no effects on the larvae. Morphological Analysis of *Bacillus thuringiensis*



# All Other Posters Category

## Poster Presentations

### SESSION II, POSTER Y-1

#### STATISTICAL GENETIC ANALYSIS OF INHIBITOR, BETHESDA ASSAY, AND THERAPEUTIC FACTOR VIII-SPECIFIC TOTAL ANTIBODY DATA IN THE PATH STUDY

Marcio Almeida, The University of Texas Rio Grande Valley, South Texas Diabetes and Obesity Institute

#### ABSTRACT

Hemophilia A (HA) is the X-linked recessive bleeding disorder caused by loss of function factor (F)VIII gene (F8) mutations leading to deficiencies in plasma FVIII coagulant activity. While FVIII replacement is currently the standard treatment for HA, the development of neutralizing anti-FVIII antibodies (“inhibitors”) is the most serious and common obstacle to effective patient care. PATH participants were genotyped using the ImmunoChip array, which enabled empirical estimates of genetic relatedness between all pairs of individuals. This information was used in a linear mixed model to estimate the heritability ( $h^2$ ) of dichotomous and quantitative traits in PATH. The dichotomous variables are historical inhibitor status (H-Inh); enrollment inhibitor status (E-Inh); and lifetime inhibitor status (L-Inh), and the continuous variables are Bethesda assay titer (Beth), total antibody against a full length (FL) or B-domain deleted (BDD) recombinant FVIII based on F8 with the H1, H2, H1+H2 (H1\_2), H3, and H4 haplotypes; specifically FL\_H1, FL\_H2, BDD\_H1\_2, BDD\_H3, and BDD\_H4 (note: these refer to the total antibody variable in relation to these tFVIII). For all traits, age and race were used as covariates. For the continuous traits only, residuals that were obtained after accounting for the age and race effects were subsequently subjected to an inverse normalization transformation to induce agreement with the normality assumption of our linear mixed model. We found that while H-Inh was not at heritable ( $h^2 = 0$ ;  $N = 412$ ), both E-Inh ( $h^2 = 0.86$ ;  $p = 0.0002$ ;  $N = 414$ ) and L-Inh ( $h^2 = 1.0$ ;  $p = 7.67E-09$ ;  $N = 414$ ) were both highly heritable, even after performing the Dempster-Lerner transformation (note that L-Inh still had a heritability of 1.0). For Beth, FL\_H1, FL\_H2, BDD\_H1\_2, BDD\_H3, and BDD\_H4 we found heritabilities of 1.0 ( $p = 4.90E-13$ ;  $N = 178$ ), 0.18 ( $p = 0.04$ ;  $N = 325$ ), 0 ( $N = 325$ ), 0.28 ( $p = 0.0009$ ;  $N = 325$ ), 0.29 ( $p = 0.0001$ ;  $N = 325$ ), and 0.30 ( $p = 0.00004$ ;  $N = 325$ ). We have established that the two most important dichotomous inhibitor variables and five quantitative correlates are significantly heritable. Thus, there is ample underlying genetic variation to justify a genetic association scan of the ImmunoChip array.

### SESSION II, POSTER Y-2

#### COST OF NON-LEGEND E-PRESCRIBED VS OTC MEDICATIONS

Marc Berger, S, MD, CM FAAFP, Department of Family and Preventative Medicine, The University of Texas Rio Grande Valley, School of Medicine

#### ABSTRACT

This study will compare the relative cash costs to the patient for either an electronically-prescribed non-legend medication versus the on-the-shelf price. Does e-prescribing a non-insurance-covered medication create higher cash costs to the patient than having them purchase the same OTC medication privately? Is it financially disadvantageous for a patient to have their physician to e-prescribe an over-the-counter medication? Research Design: For 10 commonly e-Prescribed drugs, price comparisons were obtained for retail cash price for the medications at 5 local pharmacies when they were electronically prescribed, compared to the on the shelf price for the equivalent amount of medications. A survey instrument was developed, and data were obtained by surveying pharmacists. Setting: Hidalgo county, Texas retail pharmacies: 2 chain, 1 mega-store, and 2 private pharmacies. Patients: Non involved Selection: convenience sample of pharmacies and surveyed non-prescription drugs Interventions: None, data gathering an analysis Measurements: Average cost of each electronically prescribed 30-day course compared to over-the-counter costs. Conclusions: Still to be determined. Case by case comparisons.

### SESSION II, POSTER Y-3

#### RELATIONSHIP BETWEEN SONOGRAPHIC HEPATORRENAL INDEX ESTIMATED BY DIGITAL IMAGE PROCESSING AND FATTY INFILTRATION IN THE LIVER

Rodrigo Sotelo-Landa, MD1, 2, José L. Menchaca-Gutiérrez, MD1, 2, Lenin V. Coronado-Posadas, M.Sc1, M. A. Vázquez-Garza3, Guadalupe Aquino-Rubio, B.Sc 1 Hadassa Y. Martínez-Padrón, M.Sc1, Aurora Y. Rocha-Sánchez, M.Sc1, Araní Casillas-Ramírez, Ph.D1, 2. 1 Hospital Regional de Alta Especialidad de Ciudad Victoria “Bicentenario 2010”, Cd. Victoria, Tam. 2 Facultad de Medicina e Ingeniería en Sistemas Computacionales de Matamoros, Universidad Autónoma de Tamaulipas, Matamoros, Tam. 3 Instituto Mexicano del Seguro Social, Hospital General Regional 270, Reynosa, Tam.

#### ABSTRACT

Introduction: Ultrasound is a noninvasive diagnostic method applied to steatosis detection; however, it’s not reliable with steatosis degrees lower than 30%. The ultrasound images digital processing could improve the sensitivity of this technique. Aim: Evaluate the relationship between Hepato-renal index calculated by computer analysis and degree of fatty infiltration in patients with steatosis. Methods: Ultrasound images of hepatic and renal parenchyma were acquired from patients with steatosis, and then analyzed in Image J software. Results: Liver biopsy confirmed the presence of steatosis (more than 5% fatty infiltration) in 14 of 25 patients evaluated. Spearman correlation coefficient between the HRIs and the percentage of fatty infiltration determined in histopathology was  $r = 0.9824$ ,  $p < 0.0001$ ; and when it were analyzed only subjects with a mild grade

of hepatic steatosis (less than 30% according to histopathology), the Spearman correlation was  $r = 0.9419$ ,  $p < 0.001$ . These correlation coefficients were higher than those obtained when analyzing the relationship between the degree of steatosis determined by histopathology and conventional ultrasound. Conclusions: The IHRs could be very useful for the quantitative diagnosis of hepatic steatosis through a noninvasive method. This work has been funded by the Consejo Nacional de Ciencia y Tecnología.

### SESSION II, POSTER Y-4

#### APPLICATION OF ULTRASOUND TO IMPROVE THE PROTECTIVE EFFECTS OF DRUGS AGAINST ISCHEMIA-REPERFUSION INJURY IN HEPATIC SURGERY

Jesús Sánchez-Castro, MD1, 2, Guadalupe Aquino-Rubio, B.Sc1, Carlos A. Barrón-Vargas, VMD3, Aurora Y. Rocha-Sánchez, M.Sc1, Hadassa Y. Martínez-Padrón, M.Sc1, Mónica B. Jiménez-Castro, Ph.D4, Carmen Peralta, Ph.D4, 5, Araní Casillas-Ramírez, Ph.D1,2 1 Hospital Regional de Alta Especialidad de Ciudad Victoria “Bicentenario 2010”, Victoria, Tam. 2 Facultad de Medicina e Ingeniería en Sistemas Computacionales de Matamoros, UAT, Matamoros, Tam. 3 Hospital Veterinario de Pequeñas Especies, Facultad de Medicina Veterinaria y Zootecnia, UAT, Victoria, Tam. 4 Transplants Biomedicals, S.L., Barcelona, España. 5 Instituto de Investigaciones Biomédicas Augusto Pi y Suñer, Barcelona, España.

#### ABSTRACT

Introduction: In clinical practice, hepatic resection is performed under vascular occlusion. Ischemia-reperfusion (I/R) injury, inherent to vascular occlusion, affects liver regeneration and is a determining factor of postoperative morbidity after resection. In recent years, the use of ultrasound (US) as a drug delivery technique has received the attention of research groups. Aim: Investigate whether the application of continuous or pulsed US improves the beneficial effect of melatonin on I/R injury associated with hepatic resection under vascular occlusion. Methods: An experimental model of 70% hepatic resection and ischemia during 60 minutes in Wistar rats was used. Results: Administration of melatonin reduced hepatic injury. In experimental groups with application of US alone (either in continuous or pulsed mode), transaminase levels were also reduced. The administration of melatonin combined with the application of US did not modify the parameters of injury, when compared with group treated with only melatonin. Conclusions: The application of pulsed US did not improve the beneficial effect of melatonin on hepatic I/R injury, however, US by itself reduced I/R injury, and such protection was similar to that afforded by melatonin. This indicates a non-invasive therapeutic strategy against hepatic I/R that had not been previously described.

### SESSION II, POSTER Y-5

#### PHARMACOLOGICAL TREATMENT OF PAIN

Alberto Castro Molina. Universidad Valle Mexico, Reynosa, Tamaulipas

#### ABSTRACT

Undoubtedly pain is one of the oldest and best-known symptoms for humanity. Man has learned to live with it; to give different meanings and representations, but man has done little to alleviate it. Pain is one of the most frequent reasons for consultation. The management of analgesics for treating these conditions is not always correct. The fear of the use of opioids, excessive use of anti-inflammatory and incorrect patterns are some reasons that make patients are not adequately treated. Varied are the different conditions that can be treated at pain clinic. Initially, it was thought that only patients with cancer were eligible to be served in these clinical situations. However, there are many non-cancer diseases to be considered that may present with pain in some stages. One example is diabetics who develop neuropathies that can become very painful and even lead them to total disability. This article demonstrates the most important pharmacological options for the treatment of pain, and why multimodal analgesia and its proper use are important. The mechanisms that produces it is also reviewed. The association of different pharmacological groups improves the quality of the life and reduces side effects. Barriers must be overcome in the use of drugs to use them appropriately. One must take into account both the mechanism and intensity of pain.

### SESSION II, POSTER Y-6

#### INTRATUMORAL ENVIRONMENT OF PREMENOPAUSAL ENDOMETRIAL CANCERS IN SOUTH TEXAS HISPANIC PATIENTS

Carlos A. De la Garza, MD1, Kumaraguruparan Ramasamy, PhD1, Rajeshwar Tekmal, PhD1, Edward R. Kost, MD1 1 Department of Obstetrics and Gynecology, Division of Gynecologic Oncology, UTHSCSA

#### ABSTRACT

Introduction: Endometrial cancer (EC) in South Texas is rapidly increasing. A previous publication by our group examining a South Texas population found a high number of young women with EC. It is established that obesity is a risk factor in the development of premenopausal type I EC. Proposed mechanism for this effect is up-regulation of local aromatase expression, increasing local estrogen production, and subsequent downstream effects on cancer development. Premenopausal EC often results in infertility due to hysterectomy. Through our research we seek to map the intra-tumoral environment, elucidating targets for medical therapy in fertility desiring women. Methods: From 2005 - 2016, 114 surgical specimens were selected from women aged 25 - 50, of which 74 had a diagnosis of EC and 40 benign pathology. Data were abstracted from the electronic medical records of University Health System in San Antonio, TX. Specimens were stratified according to age and BMI. Immunohistochemistry was used to evaluate expression of ER  $\alpha/\beta$ , progesterone receptors (PR) and aromatase. Scores were assigned for proportion (0 – 5) and intensity of staining (0 – 3), a total score was determined (0 – 8) and classified as: none (0), moderate (2 - 5) and strong (6 - 8). Results: We found that the majority of EC expressed ER  $\alpha/\beta$ , PR, and aromatase. BMI correlated with higher expression of these markers. Conclusion: Results show that EC in premenopausal patients expresses high levels of ER $\alpha$  and  $\beta$ , PR, and aromatase. These exploratory results suggest potential targets for hormonal therapies. Future analysis will correlate specific patient characteristics with tumor markers and targeted therapies.



**SESSION II, POSTER Y-7**

**N-LINKED GLYCOSYLATIONS IN FACTOR VIII (FVIII) ATTENUATE ITS IMMUNOGENICITY**

*Vincent P. Diego, The University of Texas Rio Grande Valley, South Texas Diabetes and Obesity Institute*

**ABSTRACT**

Hemophilia A (HA) is the X-linked bleeding disorder that results from loss-of-function mutations in F8, the gene encoding FVIII, and consequent plasma deficiencies in the activity of this essential blood coagulation protein. While intravenous infusions with FVIII therapeutics (tFVIIIs) is the standard of care for treating HA, its efficacy may be hindered, sometimes severely, if the adaptive immune system in a patient develop inhibitory anti-tFVIII antibodies. Proteolysis of tFVIII within dendritic cells (DCs) and subsequent display of tFVIII-derived peptides on human leukocyte antigen class II (HLA-II) isomers must transpire for inhibitory antibodies to arise. Using HLA-II peptidome data from DC protein processing and presentation assays, we studied the immunogenicity of different tFVIIIs using these proteins as the antigen source. Based on previous studies, we hypothesized that the N-linked glycans on tFVIIIs protect their underlying peptidic segments from developing into epitopes. We performed a Fisher’s exact test of the known non-glycosylated and glycosylated consensus N-linked glycosylation (NLG) sites over the entire FVIII molecule falling in the HLA-II bound and unbound fractions, and found that glycosylated sites are 10.3 times less likely to occur in the bound fraction (95% confidence interval of 3.3 to 42.4). To independently evaluate the importance of NLGs, we merged our peptidomic data with data from the Hemophilia A Mutation Database (HADB), formerly known as “HAMSTeRS”, which curates all HA-causing F8 missense mutations and the dichotomous inhibitor status (Inh) of the individuals harboring them. Using our peptidome data, we estimated a dichotomous bound-unbound fraction (BUF) variable, which measures the portions of tFVIIIs that are found to be bound to one or more of the distinct HLA-II isomers comprising individual repertoires or not bound to any, respectively. Using the HADB data, we created a glycosylation umbrella (GUMB) dichotomous variable defined relative to a -5 to +5 window of amino acids from the glycosylated residue of consensus NLG sites known to be glycosylated. We performed a bivariate analysis of Inh and BUF as the dependent variables with GUMB as an independent predictor variable for each using a risk function probit model. GUMB was found to be a significant predictor for both Inh (p = 0.01) and BUF (p = 0.002). We performed another analysis, this time with Inh as the single dependent variable, and both GUMB and BUF as independent predictors. Both GUMB (p = 0.02) and BUF (p = 3.04E-05) were significant predictors of Inh. The bivariate analysis definitively establishes the protective effect of NLGs independent of our peptidomic data. The second analysis shows that: 1) GUMB and BUF were independently significant, and 2) the determinants that underlie the association between Inh and BUF were clearly above and beyond the NLG effect because the BUF variable was still important even while accounting for the independent influence of the GUMB variable.

**SESSION II, POSTER Y-8**

**DESCRIPTIVE EPIDEMIOLOGY OF ADOLESCENT HEALTH IN THE LOWER RIO GRANDE VALLEY: PERSPECTIVES FROM THE JOHN AUSTIN PEÑA MEMORIAL CENTER IN EDINBURG, TEXAS**

*Eron Manusov, Vincent P. Diego, Stephanie Leal, Linda Nelson*

**ABSTRACT**

Precious little has been published on the epidemiology of health parameters of adolescents in the Lower Rio Grande Valley (RGV). We therefore sought to contribute to this area by reporting preliminary results from an analysis of data from de-identified patient records of the John Austin Peña Memorial Center in Edinburg, Texas. The variables analyzed were divided into four groups, namely physical health (PH), behavioral and mental health (BMH), sexual health including HIV (SHH), and substance use in relation to health (SUH). PH variables consisted of body mass index (BMI), systolic blood pressure (SBP), and diastolic blood pressure (DBP). BMH variables consisted of a variable on domestic violence history in the home, and standard behavioral or mental health questionnaire instruments, namely PHQ-9, CRAFT, RAAPS, MDQ, and RISK. SHH variables consisted of sexual activity (SA), birth control use, sexually transmitted infection (STI), and HIV. SUH variables consisted of spice/synthetic drug use (SDU), THC (or marijuana) use (MU), Xanax use (XU), other drug use (OU), tobacco use (TU), and alcohol use (AU). As a preliminary screen, we first performed univariate linear (for continuous or semi-continuous variables) or logistic (for dichotomous variables) regression to determine the set of potentially important independent predictor variables per dependent variable of interest. We then performed two methods of model selection, likelihood-based backward step-wise regression and Bayesian model selection approaches. In most cases, the two methods of model selection showed a high degree of agreement and wherever there was disagreement we finalized on the most conservative model (i.e., on the model containing variables identified under both approaches). Results of the model selection analyses are reported respectively for PH, BMH, SHH, and SUH in Tables 1-4. We will also report results on their predicted means and standard deviations for the continuous variables and their estimated prevalences and confidence intervals for the dichotomous variables. Our work provides an important preliminary baseline for all future health assessments of adolescents in the Lower RGV.

**SESSION II, POSTER Y-9**

**A SURVEY OF THE KNOWLEDGE OF AUGMENTATIVE AND ALTERNATIVE COMMUNICATION IN HEALTH CARE SETTINGS**

*Donald Fuller, Department of Communication Sciences and Disorders, The University of Texas Rio Grande Valley.*

*Abstract*

Augmentative and alternative communication (AAC) includes all forms of communication other than oral speech that are used to express thoughts, needs, wants and ideas. Individuals with severe communication disorders rely on AAC to supplement existing speech, or replace speech that is not functional. Current research indicates patients who use AAC and doctors are concerned with communication in a health care setting; hospital staff are seeing an increase in miscommunication and

misinterpretation with persons who use AAC; and patients who use AAC experience feelings of neglect, isolation, lack of control, and decreased satisfaction of patient care. This results in a lack of effective health care for persons who use AAC. This poster involved a survey that addressed two basic questions: (1) Are health care professionals receiving sufficient training in augmentative and alternative communication (AAC)? and (2) Do health care professionals feel confident and equipped to communicate with patients using AAC as their main mode of communication? Thirty-seven (37) respondents represented primary care (e.g., doctors, nurses), secondary care (e.g., PAs) and allied health specialists (e.g., audiologists, OTs, PTs). Results indicated that health care providers as a whole are not well versed in interacting with persons who use AAC and generally are not confident in their ability to communicate with these individuals. This points up the need for education in AAC for health care professionals.

**SESSION II, POSTER Y-10**

**CHALLENGES OF DOING RESEARCH IN PRIMARY CARE: DESIGNING RESEARCH TO WORK WITH VULNERABLE POPULATIONS**

*Evan Garcia, MS1, Leo Gonzalez, BA1, Lupita Hernandez, MPA1, Leslie Allison, MS1,3, Shandy Gonzalez, MS1,2, Diana Garza-Martinez, MEd1,3, Natividad Rangel-Hinojosa, MEd1, Deepu George, PhD1,2* 1 The University of Texas Rio Grande Valley, Edinburg, Texas; 2 Family Residency Clinic at Doctors Hospital at Renaissance, McAllen, Texas; 3 McAllen Family Medicine Residency Center, McAllen, Texas

**ABSTRACT**

UTRGV is a sub-grantee of “Si Texas: Social Innovations for a Healthy South Texas”, a funded federal initiative from the Social Innovations Fund (SIF) in partnership with Methodist Healthcare Ministries and Valley Baptist Legacy Foundation. The Si Texas Project is completing a longitudinal research study at two UTRGV Family Medicine Residency Clinics to understand the impact of integrated behavioral health. This presentation outlines challenges in completing a longitudinal study, with a vulnerable population, and will inform individuals about proactive strategies to help retain vulnerable subjects who are under researched, due to similar difficulties, in research participation. From the early stages of the study, certain challenges were anticipated and addressed to ensure that a longitudinal study would work within a vulnerable population (e.g., stigma, health literacy, and political climate, etc.). Early initiatives included adjusting terminology, providing incentives to enrolled participants, and ensuring that all documentation was accessible regardless of language or level of education. Addressing these considerations, with organizational and evidence based strategies, was necessary in order to design effective research. As a component of the Si Texas Project, a quasi-experimental design, retention rates are monitored to ensure collection of primary impact data. Based on continued monitoring, new challenges have been identified which may contribute to a sub-optimal retention rate of participants. These challenges include: lack of transportation, financial barriers, and inconsistent communication. We conclude that implementing new techniques would improve the overall retention rate of participants. Future research would benefit from employing additional research staff, specifically a Community Health Worker, to reach patients who face the aforementioned challenges.

**SESSION II, POSTER Y-11**

**FACTORS INFLUENCING SELECTION AND RETENTION OF PRIMARY CARE PRACTICE BY TEXAS PHYSICIAN ASSISTANTS: A MIXED METHOD APPROACH**

*Juliann Garza, Department of Physician Assistant, University of Texas Rio Grande Valley*

**ABSTRACT**

While other studies have identified potential factors that influence the selection of primary care practice by Physician Assistants (PA), minimal attention has been given to the how and why these factors act. Studies that describe a deeper understanding of how known factors effect specialty selection are scarce, and few operative strategies to promote primary care have been identified. This study proposes a unique collaboration among three physician assistant programs within a single state known to rank low in primary care provider to population density. This study suggest that a better understanding of the perspectives of PAs practicing in primary care could be leveraged into actionable efforts to increase the number of graduates that would select and remain in primary care practice. Guided investigations of this type are recommended by the Council on Graduate Medical Education as a means of obtaining the insight necessary to identify effective recruitment strategies. The identified strategies can be imparted into curricula to foster interest in primary care and increase the number of PA graduates who select primary care practice in a state with great needs to enhance its primary care workforce.

**SESSION II, POSTER Y-12**

**DIFFERENTIATION OF HUMAN INDUCED PLURIPOTENT STEM CELLS INTO MEDIUM SPINY NEURONS**

*Rémy Van Geersdaële, MEng1, Juan Jose Bustamante, PhD2 and Rudolf A. Bohm, PhD1* 1 Department of Biological and Health Science, Texas A&M University-Kingsville, Kingsville, Texas ; 2 Texas A&M Irma Lerma Rangel College of Pharmacy, Kingsville, Texas

**ABSTRACT**

Huntington Disease (HD) is a neurodegenerative disorder caused by an abnormal poly-glutamine (polyQ) repeat extension in Huntingtin (HTT) protein. Although it is possible to use Drosophila melanogaster as a model for other polyQ diseases, expression of a full-length mutant HTT in the fly fails to cause toxicity. Medium spiny neurons (MSN) are the principal projection neurons of the striatum and the neurons that specifically degenerate in the early phases of HD. In order to study HD mechanisms in a relevant model, human induced Pluripotent Stem Cells (hiPSC) will be cultured, and differentiated into MSN, using a simplified protocol described by Arber et al. (2015).



## SESSION II, POSTER Y-13

### OLDER MEXICAN AMERICANS: ROLE OF THE FAMILY AND MENTAL HEALTH SERVICE UTILIZATION

John M. Gonzalez, PhD, LMSW, Denise A. Longoria, PhD, LCSW, Romeo Escobar, PhD, LCSW, Leyla Feize, PhD, LCSW, Department of Social Work, The University of Texas Rio Grande Valley

#### ABSTRACT

This study explored role of the family and mental health service utilization by older Mexican-Americans. Using qualitative exploration, the study investigated family factors influencing their mental health service utilization. Researchers used a purposive sample and interviewed 20 older Mexican Americans, who completed outpatient mental health services located in Texas. Kleinman's explanatory model (1980) guided the ethnographic content analysis. Findings show the family took several roles to facilitate use of mental health services. The family was involved with respondents throughout the process of help-seeking and accessing mental health services. Family members helped respondents recognize their mental distress by noticing behavior signs and working with their physician. The family shared feedback with the doctor to help facilitate the respondent making the decision to go to treatment. The family motivated respondents by recognizing and acknowledging changes and progress in the treatment program. Respondents reported Daughters as the most instrumental family member. Future research will focus on the Daughter's role with regard to mental health service use by older Mexican Americans and the caregiver burden/stress of the daughter and other family members.

## SESSION II, POSTER Y-14

### ALONG THE BORDER: A HEALTH ASSESSMENT DURING AN IMMIGRATION INFLUX

Steven Hinojosa, MPH, CPH1, Sakshi Puri, MPH1 1Hidalgo County Health and Human Services, Edinburg, Texas

#### ABSTRACT

Background: Hidalgo County, Texas is home to a population of over 842,000 (US Census Bureau, 2015). Hidalgo County facilitates active binational transit through its ports of entry. During the summer of 2014, Hidalgo County experienced an influx of immigrants entering its border. This created the need for post-detainment shelter operations and for an assessment of the incoming population to determine health risks. Methods: This health assessment was conducted by: 1) the creation of a data collection form for the review and assessment of the shelter patients; 2) the compilation of data from these health records into a central dataset; 3) the implementation of data analyses from the health record dataset to determine health risks of the incoming population. Results: During the summer of 2014, a total of 309 medical records were reviewed. Demographical information, clinical findings, and treatment plans were recorded within the health record. The country of origin included Honduras with 132 (42.7%) patients, El Salvador with 84 (27.2%) patients, and Guatemala with 81 (26.2%) patients. Of the 309 health records reviewed, 53 (19.1%) had fever and 51 (16.5%) had rash. The median travel from country of origin to Hidalgo County, Texas ranged from 1 day to 150 days, with a median travel of 15 days. Conclusion: Enhanced local surveillance enabled the assessment of a migrating population entering Hidalgo County, Texas. This surveillance identified no significant risks in infectious disease activity, and identified other non-infectious health concerns, such as dehydration, malnutrition, and insect bites. Through this surveillance response, Hidalgo County Health and Human Services was able to better identify current needs and risks affecting both the new migrating and current community populations.

## SESSION II, POSTER Y-15

### RATIONAL DESIGN OF NOVEL POTENTIAL TRANS-SIALIDASE INHIBITORS OF TRYPANOSOMA CRUZI FOR THE PHARMACOLOGICAL TREATMENT OF CHAGAS DISEASE

Muhammad Kashif, MC1, Lenci K. Vazquez-Jimenez, MC1, Julio Cesar Lopez-Cedillo, MC2, Benjamín Noguera-Torres, PhD2, Esther Ramírez-Moreno, PhD3, Alma D. Paz-González, MC1, Carlos Garcia-Perez, PhD1, Gildardo Rivera, PhD1\* 1 Laboratorio de Biotecnología Farmacéutica, Centro de Biotecnología Genómica, Instituto Politécnico Nacional, Reynosa, México 2 Departamento de Parasitología, Escuela Nacional de Ciencias Biológicas, Ciudad de México, México 3 Escuela Nacional de Medicina y Homeopatía, Instituto Politécnico Nacional, Ciudad de México, México \*gildardors@hotmail.com

#### ABSTRACT

Chagas or American tripanosomiasis remains as an important public health problem in developing countries. In the last decade, trans-sialidase became a pharmacological target for new anti-Chagas drugs. In this work, the aims were design and find a novel series of pthaloyl derivatives of  $\beta$ -amino acid as trans-sialidase (TcTS) inhibitors and anti-trypanosomal activity. The compound 11 in series A-D with naphthyl group has showed more potent trypanocidal activity in both strains NINOA and INC-5 than commercial available drugs nifurtimox and benznidazol. Additionally, compound 4 of series B and compounds 6 and 7 of series C showed the good lysis about 80-70% in both strain, which is about 30-15% better than positive control. The binding pattern of all the ligands was found by molecular docking is similar to natural ligand DANA and occupied all essential binding sites of TcTS. Funding source: CONACyT CB 2014-01, 241615.

## SESSION II, POSTER Y-16

### THE NUCLEAR TRANSLOCATION OF TC-PTP

Mihwa Kim, Department of Biomedical Sciences, The University of Texas Rio Grande Valley

#### ABSTRACT

The nuclear translocation of TC-PTP by AKT/14-3-3 $\sigma$  axis following UVB irradiation inhibits cell Proliferation and triggers Apoptosis Mihwa Kim1, Liza D. Morales1,2, Minwoo Baek1, Thomas J. Slaga3, John DiGiovanni4, Dae Joon Kim\*1 1Department of Biomedical Sciences, School of Medicine, University of Texas Rio Grande Valley, Edinburg, TX 78541, USA; 2 South Texas Diabetes and Obesity Institute, School of Medicine, University of Texas Rio Grande Valley, Edinburg, TX 78541, USA; 3Department of Pharmacology, School of Medicine, University of Texas Health Science Center at San Antonio, San Antonio, TX 78229, USA; 4Division of Pharmacology & Toxicology, College of Pharmacy, The University of Texas at Austin, Austin, TX

78723, USA Subcellular localization of protein tyrosine phosphatases (PTPs) determines their accessibility to potential target substrates. Therefore, the regulation of the specific localization and translocation of PTPs is important to understanding their functional roles. We previously have demonstrated that the nuclear form (TC45) of T-cell protein tyrosine phosphatase (TC-PTP) is mainly localized to the cytoplasm in keratinocytes and is translocated to the nucleus following UVB irradiation. Here, we report that TC45 is translocated to the nucleus AKT/14-3-3 $\sigma$ -mediated importing mechanism after UVB exposure, which results in enhanced STAT3 dephosphorylation leading to an increase in apoptosis and a decrease in cell proliferation. UVB irradiation increased AKT phosphorylation and induced nuclear translocation of 14-3-3 $\sigma$  in addition to TC45, and inhibition of AKT phosphorylation blocked nuclear translocation of TC45 and 14-3-3 $\sigma$  in keratinocytes following UVB irradiation. Site-directed mutagenesis analysis of 14-3-3 $\sigma$  binding sites within TC45 showed that threonine 179 mutation of TC45 (TC45/T179A) blocked nuclear translocation of ectopic TC45 after UVB irradiation. Immunoprecipitation studies clearly showed that T179A didn't interact with 14-3-3 $\sigma$  after UVB, while TC45 could interact with 14-3-3 $\sigma$  in response to UVB. UVB-induced apoptosis was increased in TC45/T179A-overexpressing keratinocytes with decreased STAT3 dephosphorylation in the nucleus after UVB compared to control keratinocytes. Cell proliferation induced by UVB was higher in TC45/T179A-overexpressing keratinocytes compared to control keratinocytes. TC45 contains bipartite nuclear localization signal (NLSI and NLSII) in its C-terminus. In addition to T179, mutation of NLSII in TC45 also blocked its nuclear translocation after UVB exposure, indicating that both T179 and NLSII of TC45 are required to nuclear translocation in keratinocytes following UVB. Nuclear translocation is also observed in mouse epidermis irradiated by a single exposure of UVB. However, it is not observed in the epidermis irradiated by repeated exposure of UVB and skin tumors developed by UVB irradiation. Taken together, our findings suggest that the TC45 nuclear translocation by AKT/14-3-3 $\sigma$  axis may serve as part of an initial protective mechanism against UVB exposure. Furthermore, our studies reveals that AKT, which is known as a critical survival factor, is involved in STAT3 deactivation mechanism leading to enhanced apoptosis in keratinocytes in response to UVB irradiation.

## SESSION II, POSTER Y-17

### DOPAMINE-INDUCED GENE EXPRESSION SIGNATURES OF SCHIZOPHRENIA IN LYMPHOBLASTOID CELL LINES

Mark Z. Kos, Department of Biomedical Sciences, The University of Texas Rio Grande Valley, South Texas Diabetes and Obesity Institute

#### ABSTRACT

The dopamine (DA) hypothesis of schizophrenia (SZ) is an etiological model linking hyperactive dopaminergic signaling via the D2 receptor to psychosis, a central feature of SZ. However, DA is known to be also involved in non-receptor mediated processes, including autooxidation that leads to apoptosis, which is believed to contribute to DA neuron loss in Parkinson's disease and other neurodegenerative disorders, but whose effects in SZ are largely unknown. In this study, we analyzed whole exome gene expression (RNAseq) in 1,204 B-cell transformed lymphoblastoid cell lines (LCLs) derived from 514 European-ancestry SZ cases and 690 controls (from the Molecular Genetics of Schizophrenia, MGS, collection) in the absence or presence of 100  $\mu$ L of DA. The vast majority of expressed genes showed DA-induced expression differences (~91%; FDR2 fold), including five genes with >5 fold expression change, including four genes (HMOX1, GDF15, AMBP, and NQO1) that have known DA-related brain functions. Examining the differential responses to DA between SZ cases and controls, we identified 1,455 genes associated with SZ (FDR<0.05), with enrichment of genes related to immune processes and apoptosis, as well as brain expression and differentially expressed genes from the Stanley SZ postmortem brain collection. Our findings suggest that dopamine may play a role in SZ risk by modulating immune responses and apoptosis. The study also demonstrates the utility of a cell-based perturbation-response model for investigating the biology of complex traits.

## SESSION II, Y-18

### IDENTIFICATION OF GENETIC VARIANTS UNDER LINKAGE PEAKS ASSOCIATED WITH GALLBLADDER DISEASE IN MEXICAN AMERICANS

Juan Carlos Lopez-Alvarenga1\*, Srinivas Mummidi1\*, Vidya S. Farook1\*, Rector Arya1, Sobha Puppala2, Alvaro Diaz-Badillo1, Sharon P. Fowler3, Roy G. Resendez1, Joanne E. Curran1, Donna M. Lehman3, Christopher P. Jenkinson1, Gerald D. Dodd4, Andrew K. Diehl3\*\*, John Blangero1, Ravindranath Duggirala1; \*equal contribution; \*\*deceased 1South Texas Diabetes and Obesity Institute, University of Texas Rio Grande Valley, Brownsville and Edinburg, TX 2Department of Genetics, Texas Biomedical Research Institute, San Antonio, TX 3Department of Medicine, University of Texas Health San Antonio, San Antonio, TX 4School of Medicine, University of Colorado, Aurora, CO

#### ABSTRACT

Gallbladder disease (GBD) is a global public health issue, which disproportionately affects certain populations including Mexican Americans (MAs). Since knowledge on its specific genetic determinants is limited, we have fine-mapped two significant GBD linkage peaks on chromosome 1p (1p36.21 and 1p34.3) that were previously identified in MAs through genome-wide linkage analyses, to find genetic variants associated with GBD. Of the two regions examined, significant associations (the experiment-wide significant thresholds for the first and second linked regions were 7.95 x 10<sup>-5</sup> and 4.51 x 10<sup>-5</sup>, respectively) for both Total GBD (cholecystectomy and silent stone carriers) and Clinical GBD (cholecystectomy) occurred only in the second region. The significant associations for Total GBD involved 5 SNPs: rs11264015 (ZMYM1, 35.32 Mb, P = 5.9 x 10<sup>-6</sup>), rs12562704 (LOC653160, 35.21 Mb, P = 2.2 x 10<sup>-5</sup>), rs11263872 (ZMYM6, 35.22 Mb, P = 2.2 x 10<sup>-5</sup>), rs12408732 (ZMYM6, 35.24 Mb, P = 2.8 x 10<sup>-5</sup>), and rs12086023 (ZMYM6, 35.25 Mb, P = 2.8 x 10<sup>-5</sup>). These same markers were also associated with Clinical GBD, where the P values ranged from 3.6 x 10<sup>-4</sup> to 1.1 x 10<sup>-4</sup>. The significant association with Clinical GBD was with marker rs3738353 (GJA4, 35.03 Mb, P Value = 4.3 x 10<sup>-5</sup>). This marker was also associated with Total GBD (P = 1.1 x 10<sup>-3</sup>). These preliminary data implicate a novel ~331 kb long chromosomal region that harbors the observed GBD susceptibility loci/variants. We are now in the process of performing additional screening for identifying functional variants using whole genome sequence data.

## SESSION II, POSTER 19

### SANGER SEQUENCING REVEALS A WIDER SPECTRUM OF MUTATIONS THAN COMMERCIAL KITS IN KRAS GENE IN PATIENTS WITH COLORECTAL CANCER FROM MEXICAN POPULATION

Reyes-Cortés, LM1, Joo-Lara, BC1, López-Tavera, E1, Sánchez-Ibarra, HE1, Luna-Aguirre, CM1, Espinosa-Mata, T1, Barra-ra-Saldaña, HA 1. 1Genomic Bioanalysis Laboratory. Vitagénesis SA de CV., Monterrey, N. L. Mexico.

#### ABSTRACT

Mutation screening in RAS genes has become an effective companion diagnostic test for anti-EGFR monoclonal antibodies therapies in metastatic colorectal cancer (mCRC), which is the fourth most common cancer in Mexico. Several kits based on diverse technologies have been developed for mutation screening, but they typically cover only the most frequent mutations in Caucasian populations. In this report, the outcome of mutation screening by Sanger Sequencing (SS) of over a thousand cases of mCRC for the detection of KRAS mutations is described and compared to the conceptual mutation screening that would result of using commercial kits. This comparison was made to estimate the suitability of using these kits in the Mexican population. The samples consisted of formalin-fixed paraffin-embedded tissue from surgical biopsies. DNA was extracted and exons 2, 3 and 4 of KRAS were amplified and sequenced by SS. Out of 1030 samples tested, 344 (~33.01%) harbored a mutation in KRAS. From these, 243 were in codon 12 (~71%) and 95 (~28%) in codon 13. Codons 146, 61 and 59 accounted for the remaining ~1%, with incidences of one, one and two cases, respectively. While commercial kits based on technologies like qPCR and STA-FA can be very practical, highly sensitive and efficient, their mutation coverage leaves out rare mutations from poorly genetically characterized populations. Furthermore, substantial frequencies were found for synonymous mutations in mCRC; thus, further studies should explore their relevance in the response to anti-EGFR therapy. This study was funded by CONACYT, grant number 260826.

## SESSION II, POSTER Y-20

### EFFECTS OF PSYCHOLOGICAL STRESS BODY WEIGHT AND LIFESTYLE IN HISPANIC COLLEGE STUDENTS IN THE US-MEXICO BORDER REGION

Hongxing Lu, The Department of Biomedical Sciences, The University of Texas Rio Grande Valley

#### ABSTRACT

Background: The psychological stress is considered to play important roles in regulating body weight and may be associated with obesity. The major purpose of this research is to study the stress status and determine the effects of chronic stress on body weight and lifestyles in Hispanic college students in the US-Mexico border. Methods: Students (N=110) between 18-25 years-old were randomly recruited. The psychological stress status was determined with Perceived Stress Scale (PSS) 10 items designed by Sheldon Cohen. Nutrition and Physical Activity Questionnaire was used to estimate eating habits, weight and body image, weekly physical activity behavior, and the participant's readiness for making changes in these areas. Results: the mean value of PSS levels in Hispanic college students was 16.44±6.72. About 51.0% subjects often felt nervous. 26.0% individuals often felt that they were unable to deal with personal problems. The values of PPS were positively associated with body weight (p<0.05). The Perceived Stress Scales were negatively associated with fruit intake (p<0.01), and frequency of breakfast (p<0.05), positively related with soft beverage consumption (p<0.01), and frequency of fast-food eating (p<0.05). People who had intakes of fruits of more than four times each week had 13.7% lower PSS level, as compared to the subjects who had a fewer intakes of fruits. Conclusions: The Chronic psychological stress positively related with the development of overweight/obesity in Hispanic college student in south US-Mexico border region. The influences of stress on body weight may have been mediated partly by dietary habits in these students.

## SESSION II, POSTER Y-21

### CHARACTERIZATION OF THE HUMAN LEUKOCYTE ANTIGEN CLASS II (HLACII) THERAPEUTIC FACTOR VIII (FVIII)-DERIVED PEPTIDOME BY HLACII ISOMER AND FVIII DOMAIN

Bernadette Luu, University of Texas Rio Grande Valley, School of Medicine

#### ABSTRACT

Hemophilia A (HA) is a bleeding disorder that results from mutations in F8, the gene encoding Factor VIII (FVIII), and consequent plasma deficiencies in the activity of this essential blood coagulation protein. HA patients are primarily treated with FVIII therapeutics (tFVIII) but its efficacy may be significantly decreased if the patient develops inhibitory anti-tFVIII antibodies. Proteolysis of tFVIII within dendritic cells (DCs) and subsequent display of tFVIII-derived peptides on human leukocyte antigen class II (HLAclI) isomers must transpire for inhibitory antibodies to arise. Using HLAclI peptidome data from DC protein processing and presentation assays, we studied the immunogenicity of different tFVIII using these proteins as the antigen source. Because of the novelty of this kind of work, there is a paucity of knowledge regarding the contribution to FVIII immunogenicity by HLA-DP, -DQ, and -DR, or, by the major domains of FVIII, which are ordered as follows: A1, A2, B, A3, C1, and C2. The full FVIII protein contains minor acidic connecting peptides a1, a2, and a3 respectively connecting A1 to A2, A2 to B, and B to A3. To simplify our analysis, if an observed peptide which included these acidic regions overlapped with the large domain on its N-terminus it was placed in that domain, but, if there was no such overlap, peptides derived from these acidic regions were placed with their associated large domains on their C-terminus. We can generate expected frequencies and proportions from the FVIII domains proportionate to their domain size (including the acidic regions). Thus, we can compare the observed and expected proportions and perform a Z-test on the difference of proportions (deltaP) per domain. We found significantly higher than expected proportions in the A1 (deltaP = 4.4%; p = 0.01), A2 (deltaP = 4.3%; p = 0.01), B (deltaP = -16.9%; p = 3.03E-21), and A3 (deltaP = 12.5%; p = 4.93E-11) domains but not in the remaining C1 (deltaP = -3.2%; p = 0.07) and C2 (deltaP = -1.1%; p = 0.30). We can similarly characterize the contributions to the HLAclI peptidome by HLA isomer. One interesting observation that immediately stands out is the finding in our data that there is a significantly less than expected proportion of peptides derived from the B domain. The B domain is replete with N-linked glycosylations (NLGs) (in fact, 16 of the 20 definitively known N-linked glycosylations reside in the B domain). Moreover, NLGs have been hypothesized to protect their underlying parent peptides from becoming epitopes. Our finding confirms this hypothesis and can also be seen as the beginnings of a thorough characterization of FVIII immunogenicity by domain and HLAclI isomer.

## SESSION II, POSTER Y-22

### INITIAL DATA FROM AN INTEGRATED INTERPROFESSIONAL MODEL DEVELOPED SOCIO-DEMOGRAPHIC INSTRUMENT FOR INTEGRATED CARE OF ADOLESCENTS DIAGNOSED WITH A MEDICAL ILLNESS, MENTAL ILLNESS, AND SUBSTANCE ABUSE/APPETITIVE DRIVE DISORDER

Eron Manusov, MD, Jesus Garza, MD, Linda Nelson, RN MS, Vincent Diego, PhD. Stephanie, Leal, MS, Miguel, Lopez, MSW, Sudershan Pasupuleti PhD, John Lowdermilk PhD.

#### ABSTRACT

The Integrated Interprofessional Care Unit (ICCU) is a model that deploys the academic resources of The University of Texas Rio Grande Valley (UTRGV), UTRGV School of Medicine as well as established community organizations and agencies to address the challenges inherent in treating triply-diagnosed adolescents (age 12-18 year old adolescents diagnosed with a medical illness, mental illness, and substance abuse/appetitive drive disorder). The clinic provides for collaboration and integration of University resources and improved community outreach and coordination to build capacity and care for a high-risk population. The model incorporates 12 disciplines integrated into a primary care practice that focuses interprofessional care coordination with available agencies, school districts, a Juvenile Justice System and a Department of Health. The clinic not only employs integrated services, care coordination, case management and multiple therapies, but incorporates learners from three colleges in the UNTRV. This preliminary report will present the post-hoc analysis of an interprofessional socio-demographic screen and battery of instruments created by the ICCU to address the gaps in knowledge concerning issues of critical importance to the overall health and vitality of the youth in one of the poorest counties on the Texas-Mexico border. The best set of logistic regression predictors was determined by Bayesian model selection (BMS). The use of instruments such as the CRAFFT (Car, Relax, Alone, Forget, Friends, Trouble) Screening Test, Rapid Assessment for Adolescent Preventive Services (RAAPS), Suicide Risk Assessment Scale, Substance Abuse Subtle Screening Inventory, SSASI, and Patient Health Questionnaire (PHQ9) will be discussed. The presentation comprises a short description of the integrated model, the instruments, the data collected and recommendations for future research and use for treating triply diagnosed adolescents

## SESSION II, POSTER Y-23

### SYNTHESIS AND STRUCTURE-ACTIVITY RELATIONSHIP STUDY OF NICLOSAMIDE DERIVATIVES IN PROTEIN UBIQUITINATION AND PRO-SURVIVAL SIGNALING PATHWAYS IN THE IN THE HUMAN GLIOBLASTOMA CELLS

Shizuo Mito1, Benjamin A. Garcia1, Liza D. Morales2, Yonghong Zhang1, Andrew Tsin3, Benxu Cheng3, 1 Department of Chemistry, University of Texas Rio Grande Valley, Edinburg, Texas; 2 South Texas Diabetes and Obesity Institute, School of Medicine, University of Texas Rio Grande Valley, Edinburg, Texas; 3 Department of Biomedical Sciences, School of Medicine, University of Texas Rio Grande Valley, Edinburg, Texas, USA

#### ABSTRACT

Niclosamide (trade name Niclocide) is an FDA-approved anti-helminthic drug and has been used in humans for nearly 50 years. In the past several years, this drug has drawn renewed attention because it has been identified as a potential anticancer agent, and anticancer effects in a variety of in vitro and in vivo cancer models have been reported. There is one article for anticancer effect on human glioblastoma cells, but the mechanism(s) of action remains to be elucidated. Recently, we found that niclosamide induced cell toxicity in human glioblastoma U87-MG cell line corresponding to increased protein ubiquitination, ER stress, and autophagy. Furthermore, niclosamide treatment led to down-regulation of multiple pro-survival signal pathways including Wnt/ $\beta$ -catenin, PI3K/AKT, MAPK/ERK, and STAT3, which further caused reduction of U87-MG cell viability. These results offered new understandings in the tumor suppressive capabilities of niclosamide and therefore encouraged us to modify the structure of niclosamide to study the precise anti-cancer mechanism of niclosamide. These study will also help to discover the functions of the drug and find better drugs. We synthesized niclosamide derivatives using niclosamide as a structure scaffold, and the replacements of substituents resulted in an appreciable decrease in protein ubiquitination along with other signaling pathways. These obtained results will be valuable information for developing new drugs against human glioblastoma and other cancers.

## SESSION II, POSTER Y-24

### INSULIN SIGNAL TRANSDUCTION PROMOTES EXPRESSION OF ALCOHOL DEHYDROGENASE 1B IN HUMAN ADIPOCYTES

Liza D. Morales, MS1, Ravindranath Duggirala, PhD1, Christopher P. Jenkinson, PhD1

1South Texas Diabetes and Obesity Institute, University of Texas Rio Grande Valley School of Medicine, Edinburg, TX

#### ABSTRACT

Insulin is an essential hormone required to regulate glucose homeostasis and metabolism. Insulin resistance can arise when tissues fail to respond to insulin activity and it can lead to serious health problems including Type 2 Diabetes (T2D). Obesity is a major contributor to the development of insulin resistance and T2D. The prevalence of both obesity and T2D is disproportionately high in ethnic minorities such as Mexican Americans, due in part to a genetic predisposition to these metabolic disorders. Previously, we found that mRNA and protein expression of alcohol dehydrogenase 1B (ADH1B), an enzyme that metabolizes alcohol, is highly correlated with obesity and insulin resistance in Mexican Americans. Therefore, we currently are investigating the functional role of ADH1B in human adipocytes and its potential contribution to the development of insulin resistance and obesity. Western blot analysis demonstrates that ADH1B protein is differentially expressed in cultured mature human adipocytes depending on the donor BMI. A "lean" BMI of <25 kg.m2 was associated with high protein expression whereas an "obese" BMI >30 kg.m2 was associated with low protein expression. Insulin treatment stimulated a 3–4-fold increase in ADH1B expression. Conversely, inhibition of AKT, an important protein kinase in the insulin signaling pathway, suppressed this effect. Furthermore, knockdown of ADH1B using pooled small interfering RNA (siRNA) resulted in a 35% decrease in glucose uptake, a central target of insulin-stimulated glucose metabolism. Taken together, the data suggest that ADH1B plays an important role in adipocyte insulin signaling and activity, which has not previously been reported. This work was supported by NIH grant DK079195 (CPJ).

## SESSION II, POSTER Y-25

### NOVEL INSIGHTS INTO THE MECHANISMS ASSOCIATED WITH PRE-DIABETES IN NON-OBESE INDIVIDUALS USING TRANSCRIPTOMICS AND PATHWAY ANALYSIS

Mummididi A1, Alvarenga JC, PhD2, Jenkinson CP, PhD2. 1Keystone Upper, San Antonio, Texas, 2South Texas Diabetes and Obesity Institute, UTRGV, Edinburg, Texas

#### ABSTRACT

Type 2 diabetes (T2D) is a long term metabolic disorder that is characterized by high blood sugar and insulin resistance. An estimated 382 million people suffer from T2D worldwide, burdening the healthcare infrastructure and significantly impacting the economy. While T2D is often considered a life style disease, a substantial number of non-obese people also develop T2D. The mechanisms whereby non-obese people develop T2D are poorly understood. To bridge this knowledge gap, in this study, we investigated two groups of non-obese subjects who were matched for their body mass index: normoglycemic (NG) and prediabetic (PD) people. Gene expression profiles were obtained in skeletal muscle biopsies under basal conditions and after a hyperinsulinemic-euglycemic clamp (HGC). Differential gene expression was measured after preprocessing the transcriptomic data, both at basal level and after HGC. The PD individuals showed substantial differences when compared to NG, with significantly upregulated and downregulated genes both at basal and post-HGC conditions. The functions of the genes and their interrelationships were assessed using pathway analysis. The differentially expressed genes could be broadly grouped into the following categories: inflammation, carbohydrate metabolism, and insulin secretion/processing/signal transduction. Notable genes included CD44, MAOA, and MIDN which are related to inflammation, glucose uptake, and insulin secretion, respectively. This study provides strong evidence that prediabetic individuals, in the absence of obesity, have gene expression signatures that are similar to those of obese people with T2D. These results have important implications for their clinical management and treatment. This work was supported by NIH grant DK079195 to CPJ.

## SESSION II, POSTER Y-26

### ASPARTAME TREATMENT ON CELL VIABILITY AND VEGF SECRETION ON RHESUS MONKEY RETINAL ENDOTHELIAL CELLS IN CULTURE

Brandi Obregon1, Andrew Tsin1, 1 Department of Biomedical Sciences: The University of Texas Rio Grande Valley School of Medicine

#### ABSTRACT

Diabetes mellitus is a chronic condition in which an impairment of glucose metabolism produces an increased serum glucose levels which can lead to deleterious effects in multiple organs and systems. Worldwide, approximately 285 million people have diabetes and over one-third show signs of Diabetic Retinopathy (DR). Due to the glucose restriction in the diet of diabetic patients, the use of sugar substitutes has become widely used by these patients. One most used of these is aspartame which is an artificial, non-saccharide, sweetener found in many popular sugar-free foods and beverages. In a previous work, we reported that glucose decreased cell viability and increased VEGF secretion in Rhesus Monkey Retinal Endothelial Cells (RhREC) which are two of the major components of DR pathogenesis. Could the aspartame have a similar effect on these cell line? Methods: RhREC were seeded in 6 well plates at 100k per well and treated with 0, 50, and 100uM of aspartame for 72hrs. ELISA was used to determine secreted VEGF levels in the conditioned media. Cell viability was measured using the trypan blue dye exclusion method. Results: Cell Viability after 72hrs increased from 100k (control) to 125k (50uM) and to 118k (100uM). VEGF levels increased from 500 pg/ml (control) to 750 pg/ml (50uM) and 1000 pg/ml (100uM). Conclusions: Aspartame increased cell viability and VEGF secretion by the cells approximately 50%-100% over controls. Further studies will be needed to fully understand the effect of aspartame on diabetic patients who consume foods and beverages with this chemical sweetener, as well as its contributing role to DR.

## SESSION II, POSTER Y-27

### DESIGN AND DEVELOPMENT OF A PORTABLE HANDHELD DEVICE FOR NANOFIBERS PRODUCTION VIA FORCESPINNING

Javier Ortega, PhD1, Simon Padron1, Glendimar Molero1, Felipe De la Torre1, Karen Lozano, PhD1 1 Mechanical Engineering Department, The University of Texas Rio Grande Valley

#### ABSTRACT

Forcespinning is a novel method developed to produce nanofibers from a wide range of materials using centrifugal force instead of electrostatic force as in the electrospinning process. Recently, a light, hand held portable device capable to produce nanofibers via Forcespinning in situ without the use of electric fields has spiked special interest in the medical field, to use in the treatment for the healing process of wounds. At the moment of applying a nanofibers patch produced by this portable device, the area desired to be protected can be covered in a more proficient way, due to its ability to satisfy wounds' topology. The main aim of the present project was to design, develop and test a light, handheld portable device capable of producing nanofibers via Forcespinning for in situ applications. In order to achieve our objective, a portable device that would produce fibers in the nanometer range in a safe, accurate and easy to use was designed and developed at UTRGV. Four main components compose this portable device; collector, reservoir, spinneret, and the handle. The device was successfully tested producing fibers on the nano scale from Polyvinyl alcohol (PVA) and Polyvinylpyrrolidone (PVP) solutions with different concentrations. Both polymers have been used as skin substitutes and as a dressing for wound healing purposes. Fiber diameters and morphology were measured and analyzed by scanning electron microscopy (SEM). After testing, it was proved that the portable device is capable to produce nanofibers out of several biocompatible materials via Forcespinning.

## SESSION II, POSTER Y-28

### THE MANAGEMENT OF DATA ASSOCIATED WITH THE OPERATIONAL FLOW OF THE BIOBANK, AN ESSENTIAL STEP FOR ITS ADVANCE.

Daniela Estefanía Monsiváis-Ovalle, LT1, Ma. de Lourdes Garza-Rodríguez, PhD1, Celia Nohemí Sánchez-Domínguez, PhD1, María del Carmen Villalobos-Torres, PhD1, Claudia Maribel Luna-Aguirre, PhD2, Hugo Alberto Barrera-Saldaña, PhD1,2, Antonio Alí Pérez-Maya, PhD1\*. 1. Biochemistry and Molecular Medicine Department, Medical School, Universidad Autónoma de Nuevo León, 2. Vitagénesis, S.A. de C. V. Medical Laboratory. Monterrey, Nuevo León, México. \*Corresponding author bioquimicomty@gmail.com

#### ABSTRACT

Biobanks are public or private entities specialized in the management and distribution of biological samples. Constitute a key tool in the provision of high-quality biological stored material and the information associated with these specimens being ruled by ethical and legal principles that aim to guarantee the quality of the stored material and the rights of the donors. In the implementation of the National Laboratory Biobank, we have implemented the Laboratory Information Management System (LIMS) of ThermoFisher as sample management software that allows us to satisfy the requirements of the users of the biobank while helping to comply with legal and operational requirements. In various institutions in the country, we have promoted the organization of networked infrastructures and we are making efforts to consolidate the coordinated operation of these, so as to allow greater opportunities for biomedical research. We have been able to provide the samples and their associated quality information to the researchers that requesting biological material. We have given special attention, from the outset to data management and operational workflow during the implementation of computer systems, to ensure the usefulness of the samples and to be ready for future integration and active collaboration with international biobanks.

## SESSION II, POSTER Y-29

### PREVALENCE OF MENTAL HEALTH PROBLEMS AMONG UTRGV STUDENTS

Deanna Pollard, Mauricio Yanez, Liza Talavera-Garza, Ph.D., Department of Psychological Science, University of Texas Rio Grande Valley

#### ABSTRACT

College can be one of the most stressful times experienced by an individual and can lead to the development of mental health issues. A recent study found that a considerable percentage of the college student population reports mental health problems, ranging from depression to feelings on anxiety (Beiter et al., 2015). The purpose of this study is to compare rates of diagnosed and self-reported mental health problems among UTRGV students to those of a national college student sample. The Fall 2016 wave of the National College Health Assessment II, which is a yearly survey of college students' health, health behaviors, and stressors, was analyzed to determine whether there are significant differences between UTRGV students and a national college student sample on reports of mental health issues. UTRGV students reported significantly lower rates of diagnosed anxiety (13.3% vs. 19.1%,  $p < .001$ ) and depression (8.8% vs. 15.2%,  $p < .001$ ) when compared to the national sample of college students but similar rates of mental health items that impacted their academic performance—depression (14.8% vs. 15.4%, n.s.) and stress (32.3% vs. 32.2%, n.s.). The differences in rates of diagnosed disorders between UTRGV students and the national sample could be due to protective factors imparted by the Hispanic culture such as familism and social support. However, another potential explanation for discrepancies in these rates, particularly given that UTRGV students endorsed similar rates of self-reported depression and stress, is that there are cases of undiagnosed disorders among UTRGV students. Several barriers, such as language discrepancies with providers and negative cultural perceptions regarding seeking treatment for mental health problems, have been identified which can deter Hispanics from seeking formal mental health services. Recommendations for future directions will be provided.

## SESSION II, POSTER Y-30

### FLEABORNE TYPHUS: DISEASE EPIDEMIOLOGY AND OBSERVATIONS FROM THE FIELD IN HIDALGO COUNTY, TEXAS

Sakshi Puri, Hidalgo County Health and Human Services

#### ABSTRACT

Fleaborne Typhus: Disease Epidemiology and Observations from the field in Hidalgo County, Texas Sakshi Puri, MPH Hidalgo County Health and Human Services, Edinburg, Texas sakshi.puri@hchd.org Fleaborne typhus, has been established in Hidalgo County and is now considered endemic to the area. Fleaborne typhus is a rickettsial disease caused by Rickettsia typhi and R. felis, which are transmitted to humans by fleas. It is clinically similar to, but milder than, epidemic typhus causing chills, headache, fever, and rash. A five year trend of murine typhus is analyzed for case counts, location, age group and seasonality to determine if there are any significant effects of these factors. In addition, hospitalization trends of the cases reported for the past 5 years were also examined to ascertain changes in severity of this disease. Lastly, an attempt to discern and establish the major reservoirs of transmission in the cases reported was made through an assessment of available case reports for the year 2015. The resulting trends and observations will also be discussed. Observations from the field as well as lessons learnt are also included in this poster presentation to improve data gathering processes and to strengthen the surveillance efforts for monitoring fleaborne typhus in the State of Texas.



## SESSION II, POSTER Y-31

### PROGRAM FOR PREVENTION OF PANCREATIC, LIVER AND KIDNEY DISEASES IN UNIVERSITY STUDENTS. ESFUERSO

LAURA RAMIREZ, LABORATORIO ANÁLISIS CLÍNICOS

#### ABSTRACT

Adapting into university life is a challenge for young people and their parents. Many freshmen move away home and start living and studying independently, thus, increased stress and the modification of physical activity and food habits. The risks of obesity, cardiometabolic (CMF) and kidney diseases (KD) can start at a very young age. Moreover, recent studies suggest these diseases start their clinical manifestations in youth, associated with genetic and environmental interaction (GxE). This field requires solid studies to support this etiological concept and programs based on GxE. This is a pragmatic study with 3,000 freshmen students for assessment of risk of CMF and KD. From these students, we will include 600 for follow-up of 4 years and under a nutrition and physical activity plan, and medical reference to Hospital General de Reynosa in case of clinical manifestation of disease. Mendelian randomization and analysis of GxE (about 60 SNPs for CMF or KD x life style changes) will be performed. This study will analyze GxE to explain the risk of CMF and KD and if an interactive program can prevent these illness. The study includes multidisciplinary academic teams from Reynosa (HGR, UAT UMAN) and Mexico City (HGM, INMEGEN, INPer, TecMonterrey). It is planned to include private enterprise and CONACyT for financial support. The statistical analysis implies complex techniques like multi-level analysis, multi-stage neural networks and mendelian randomization.

## SESSION II, POSTER Y-32

### INHIBITION OF NFKB-INDUCED INFLAMMATION BY THE SYNTHETIC TRITERPENOID CDDO-EA

Fang-Mei Chang, BS1; Thomas J. Slaga, PhD2; Sara M. Reyna, PhD1 1University of Texas Rio Grande Valley, School of Medicine, Department of Biomedical Sciences, Edinburg, TX; 2University of Texas Health Science Center, Department of Pharmacology, San Antonio, TX

#### ABSTRACT

Chronic inflammation is a key source of insulin resistance. Type 2 diabetes (T2D) is associated with higher circulating levels of lipopolysaccharide (LPS). This results in endotoxemia, which is linked to insulin resistance. Chronic activation of pro-inflammatory pathways, such as nuclear factor  $\kappa$  B (NF $\kappa$ B), in skeletal muscle of type 2 diabetics is a major determinant for the pathophysiology of insulin resistance. Therefore, the development of strategies for reducing inflammation is important for preventing and treating insulin resistance. Synthetic oleanate triterpenoids (SOs) are derived from oleanolic acid. Two-cyano-3,12-dioxooleana-1,9(11)-dien-28-oate-ethyl amide (CDDO-EA) is an SO studied for its anti-inflammatory properties. However, it is not known if CDDO-EA blocks inflammation in skeletal muscle of T2D individuals. We examined whether CDDO-EA prevents NF $\kappa$ B activity in LPS-mediated inflammatory responses in muscle cells. L6-GLUT4 myotubes were pre-treated with CDDO-EA, and then treated with LPS. CDDO-EA induced a decrease of LPS-induced NF $\kappa$ B phosphorylation. To determine if CDDO-EA inhibited LPS-induced NF $\kappa$ B transcriptional activity, subcellular fractionation was performed to assess the effect of CDDO-EA on LPS-induced p65 NF $\kappa$ B nuclear translocation. LPS induced an increase in p65 NF $\kappa$ B levels in the nuclear fraction. When NF $\kappa$ B was inhibited by CDDO-EA, p65 NF $\kappa$ B nuclear levels decreased while p65 NF $\kappa$ B levels increased in the cytosolic fraction. In addition, CDDO-EA lowered LPS-induced mRNA levels of TNF- $\alpha$  and MCP-1. In summary, CDDO-EA blocks NF $\kappa$ B activation by preventing its translocation to the nucleus and lowers the levels of pro-inflammatory mediators. We propose that CDDO-EA inhibits NF $\kappa$ B-mediated inflammation in skeletal muscle and that CDDO-EA has potential insulin sensitizing properties.

## SESSION II, POSTER Y-33

### EPIDEMIC URBAN CYLES OF ZIKA AND CHIKUNGUNYA VIRUSES IN THE CITY OF REYNOSA, MEXICO

Stephanie Viridiana Laredo Tiscareño, MsC1, Carlos Machain-Williams, PhD2, and Mario A. Rodríguez-Pérez, PhD1 1Centro de Biotecnología Genómica-Instituto Politécnico Nacional, Reynosa, Tamaulipas, Mexico, 2Centro Regional de Investigación-Universidad Autónoma de Yucatán, Mérida, Yucatán, Mexico

#### ABSTRACT

Zika and Chikungunya are the most important arboviral diseases in Mexico (1). These arbovirosis have displayed an explosive spread because multifactorial eco-epidemiologic and demographic factors, i.e. colonization of new habits of the vector *Stegomyia* (=Aedes) mosquitoes and migration of infected people from hyper-endemic areas to the U.S.-Mexico border (2). Here, we report the isolation of Zika and Chikungunya viruses from serum samples of six suspected patients with Dengue infection in the city of Reynosa. Patients' serum samples were collected by personnel of the Ministry of Public Health of the city of Reynosa during 2015 and 2016. These viruses in serum samples were inoculated and growth in C6/36 cells. Viral RNA extraction was carried out using the Trizol method and specific genomic fragments were amplified using the RT-qPCR technique. Three viral strains of Zika and three of Chikungunya were found indicating the circulation of these viruses in communities located in the U.S.-Mexico border. Studies to unveil viral lineage of these viral strains are currently underway.

## SESSION II, POSTER Y-34

### QUALITY CONTROL AND CERTIFICATION IN BIOBANKING

Ma. de Lourdes Garza-Rodríguez, PhD1, Antonio Ali Pérez-Maya, PhD1, María del Carmen Villalobos-Torres, PhD1, Daniela Estefanía Monsiváis Ovalle, LT1, Claudia Maribel Luna Aguirre, PhD2, Hugo Alberto Barrera-Saldaña, PhD1,2, Celia Nohemí Sánchez-Domínguez, PhD1. 1. Biochemistry and Molecular Medicine Department, Medical School, Universidad Autónoma de Nuevo León, 2. Vitagénesis, S.A. de C. V. Medical Laboratory. Monterrey, Nuevo León, Mexico. Corresponding author celianohemi@hotmail.com

#### ABSTRACT

The number of public and private health and educational institutions that manage the concept of biorepositories is increasing. These are collections of biological samples collected for long periods of time, obtained through research projects or during patient care processes. The difference between a biorepository and a biobank is that in the latter, samples are available for use; they have a strict quality control in collection, processing and storage of samples; recovering of associated information along with ethical committee approving and written authorization of donors. The goal of National Laboratory Biobank (CONACyT) is the ISO 9001:2015 certification. Methods: To establish the quality management system (QMS), we define the policy, the quality objectives, the scope and the key processes. We defined the interested parties (customers, institutions, government), quality plan, SWOT analysis (strengths, weaknesses, opportunities, and threats), and finally we proceeded to prepare the documents and formats required by the QMS. Results: We are currently planning the internal audit, and then we will continue with the ISO 9001:2015 certification before the end of this 2017. Accreditation processes will be considered in 2018. Conclusion: Even when the implementation of the ISO standard implies a great effort, good laboratory practices, proper attitude of staff, and an adequate training will allow us to successfully meet the objectives established by our laboratory. This work was supported by the grant of National Laboratories CONACyT Project Number: 271386.

## SESSION II, POSTER Y-35

### THE UNIVERSITY OF TEXAS SYSTEM HEALTH BIOBANK CONSORTIUM

Jeffrey Rando, 1 Jennifer E. Sanner, PhD1 1The University of Texas Health Science Center at Houston, School of Nursing, Houston, Texas

#### ABSTRACT

Precision medicine demands a broad approach to discovering and understanding treatment options for individual patients. The era of personalized medicine requires larger sample sizes in order to research new treatment approaches and therapeutics. By bringing together the professional biobanking expertise and resources of large academic research and clinical institutions within the University of Texas (UT) System, we propose to create the UT System Health Biobank (UTSHB) Consortium. The goals of the UTSHB Consortium are to: 1) share biological samples, and related phenotypic and genotypic data; 2) increase biological prospective sample and data collection (including longitudinal), processing, and storage for future research use and collaborative sharing; and 3) create cost-effective, automated, and best-practices-based biobanking operations across UTSHB Consortium campuses. While the UTSHB consortium itself is governed by representatives from UTSHB campuses, individual biological samples and data remain with, and are governed by, the contributing investigator. The UTSHB Consortium will improve the research infrastructure for scientists and trainees at UTSHB campuses, and make our researchers more competitive for private and federal research funding, which will position us for impactful translational science and precision medicine. The UTSHB Consortium is funded by the UT System.

## SESSION II, POSTER Y-36

### SMARTWATCH TECHNOLOGY IN HEALTHCARE DELIVERY AND COMMUNITY OUTREACH:

#### A PILOT STUDY IN SOUTH TEXAS

Beatriz Tapia, M.D., Ph.D. Department of Faculty Matters, The University of Texas Rio Grande Valley, School of Medicine

#### ABSTRACT

Many health care practices of smartwatch technology have been reported, inclusive of the use by patients for personal health tracking, provider-patient communication, and medication reminders. However, the value of smartwatch technology to improve the quality and effectiveness of health care delivery and community outreach remains unknown. Aims: The purpose of this pilot study is to identify the use of smartwatch technology for patient care and community outreach and gather evidence to guide future smartwatch implementations in healthcare environments. Methods: We provided sixty-four healthcare professionals with smartwatch device in two different healthcare settings in South Texas. Primary Care Practices and promotoras, both groups reported the usage of smartwatch technology at baseline, 1-month, 3, 6, 9 & 12 months in their roles as healthcare providers over the period of one-year. A team of educational technology professionals identified mobile technology needs of the study participants and developed a smartwatch app prototype to be deployed and assessed in a future study. Discussion: This pilot study examines the utility of smartwatch technology for patient care and community outreach. Preliminary analysis of surveys by healthcare groups has demonstrated potential uses for smartwatch technology. Our research has identified the following areas of healthcare delivery enhancement such as improved communication, reminders and alert for patient appointment and follow-up.

**SESSION II, POSTER Y-37**

**USF-UTRGV-UCE PHOTOVOICE PROJECT: HEALTH INITIATIVE IN UNDERSERVED COMMUNITIES IN THE UNITED STATES SUBJECT TO IDENTICAL ENVIRONMENTAL HAZARDS AS DEVELOPING COUNTRIES**

Ana Santos, MPH1, Michelle Zeager, DO, MPH2, Goldny Mills Bradshaw, MD, MPH3 Robert Nelson, Jr., MD, MS2 1 University of South Florida (USF), Tampa, FL, 2 The University of Texas Rio Grande Valley (UTRGV) School of Medicine, Edinburg, Texas, 3 Universidad Central del Este (UCE), Dominican Republic

**ABSTRACT**

Identifying environmental hazards adversely impacting health, especially in the most vulnerable populations, is crucial in preventing exposure and improving health. This Photovoice project demonstrates that exposure to similar environmental hazards exists in developed and developing countries. The objectives of this work are to identify, through photographs, environmental hazards to which Texas colonia and Dominican Republic bateye residents are exposed and provide a platform for critical discussions about defined hazards and potential solutions. Ultimately, the goal is to empower community members and leaders to design education programs and develop sustainable solutions to improve the health and quality of life in these communities. UCE epidemiology students and UTRGV physicians used smart phones and iPads to photograph in and around homes and recreation areas in colonias and bateyes. Participants submitted photographs with brief descriptions identifying the hazard, location, and potential solution. Photographs were reviewed and categorized into Safety/Structural Hazards, Water Hazards and Sanitation/Hygiene and communities were compared. This project reveals bateye and colonia residents are exposed to almost identical environmental hazards that can significantly impact the health and well-being of community members. To improve health, environmental hazards in these communities need to be addressed. UTRGV pediatrics faculty are developing a problem-based, community-service elective where students learn to perform environmental hazards/needs assessments and with faculty, peers and community members, develop education material about hazards, health effects, and methods/solutions to decrease exposure in order to improve human health.

**SESSION II, POSTER Y-38**

**BENEFITS FROM ANTIOXIDANTS IN NON ALCOHOLIC FATTY LIVER**

Jose Alfonso Acevedo, Departamento de patología de la Universidad Evangélica de El Salvador

Non Alcoholic Fatty Liver (NAFL) is a disease of a great importance for medical community for being considered the hepatic factor in metabolic syndrom, associated to dyslipidemia, obesity and diabetes mellitus. Teorically, oxidative stress has been considered as the determinant factor in its etiopatogeny, originated from a lower antioxidant activity and the rise of prooxidant factors starting from hyperinsulinemia. In this research, the diagnosis of fatty liver was made through: clinical and laboratory tests, ultrasound, NAFLD Score; besides the non traditional method Quantic Bioelectric System (QRS) which has an 85% sensibility that was verified through findings in laboratory and ultrasonographic tests. Research starts with a group of 28 patients who were diagnosed as NAFL through quantic system (QRS), and from this group there were 5 people selected and there were only 3 who met inclusion and exclusion criteria. Subjects in research received supplements with 4 daily capsules for 6 months, and each one of them contained 13 antioxidants. As a result, a normal rate of clinical, biochemical and ultrasonographics parameters and bioelectrical quantic system from the subjects without diet or daily activities modifications.



# Late Breaking Submissions

## All Other Poster Category

### Presentation

#### SESSION II, POSTER Y-39

##### MYOFILAMENT TYROSINE PHOSPHORYLATION IS ALTERED IN ERBB2 TRANSGENIC MICE

Xu M1, 2, Heravi A1, Fu Z3, Sysa-Shah P4, Belmonte F4, Gabrielson K4, Everett A1, Murphy AM1 and Ramirez-Correa GA1  
1Department of Pediatrics/Division of Cardiology, Johns Hopkins University School of Medicine, Baltimore, Maryland, USA. 2Department of Internal Cardiology, Shen Zhen Children's Hospital, Shen Zhen, China. 3Department of Pediatrics/Division of Hematology, Johns Hopkins University School of Medicine, Baltimore, Maryland, USA. 4 Department of Molecular and Comparative Pathobiology, Johns Hopkins University School of Medicine, Baltimore, Maryland, USA.

##### ABSTRACT

The role of sarcomeric genetic mutations is well established in familial cardiomyopathy, and genetic testing is used in patients; however, the potential effects of posttranslational modifications of cardiac sarcomere proteins are largely overlooked and have not been applied to clinical care yet. The contractile force of the heart is regulated by phosphorylation of Ser/Thr on myofilaments and calcium handling proteins at key sites. We hypothesized that sarcomere tyrosine phosphorylation also regulates heart function. More specifically, we tested if pathways downstream of the ErbB2 tyrosine kinase receptor—antagonized by AG-825—regulate cardiac function. Transgenic mice with cardiac-specific ErbB2 overexpression develop cardiac hypertrophy. We hypothesized that phospho-Tyrosine proteome is altered in TgErbB2 and that inhibition of ErbB2 signaling would protect against cardiac dysfunction. We compared myofilament pTyrosine proteome between Non-transgenic (Ntg) and TgErbB2 mice by mass spectrometry and evaluated cardiac function in four groups of mice: (1) TgErbB2/saline treated, (2) Ntg/saline treated, (3) TgErbB2/AG-825 treated, and (4) Ntg/AG-825 treated mice. We detected ~500 pTyr peptides and identified 16 peptides that were differentially regulated. Interestingly, most of the phospho-tyrosine sites on myofilament proteins (Titin, Myosin-6, and Actin) were down-regulated. On the other hand, most of phospho-tyrosine sites for Tyrosine and Ser/Thr kinases (Stat5a, Stat5b, Axl, Yes and Gsk3a) were up-regulated. Additionally, we found a time-dependent decline in ejection fraction and fractional shortening of saline treated TgErbB2 mice (P=0.04 and P=0.02, respectively). These parameters did not decline in TgErbB2 mice treated with AG-825 (P=0.91 and P=0.94), suggestive of a protective effect against hypertrophic cardiomyopathy. We plan to further characterize sarcomere protein tyrosine phosphorylation in AG-825 treated mice and evaluate myofilament pTyrosine as a marker for functional status. Our study also emphasizes the potential of pTyrosine protein modifications as a new generation of biomarkers and biological targets for treatment of cardiac dysfunction.

#### SESSION II, Y-40

##### THERMAL DOSE DISSIPATION APPROACH FOR ESCHERICHIA COLI

Ivan Davila, University of Texas Rio Grande Valley, Department of Physics

##### ABSTRACT

Apoptosis of mutated cells via magnetic hyperthermia has gained advocacy as technology capable of being used in lieu of chemotherapy for minimizing cancer tumors. This avant-garde technique uses positively charged dextran coated magnetic iron oxide nanoparticles (MION's) to achieve higher mortality rates in cells. Biocompatible, minimally invasive theranostics colloidal solution of MION's adhere to gram negative E. coli bacteria via electrostatic forces. The MION's are fabricated using Ismatec microfluidic system by interaction of a Solution A (containing 2Fe(NO3)3 + FeSO4) with solution B (containing NaOH + 2% Dextran) to create 50 nm particles with a biocompatible dextran coating and a Fe3O4 core. The particles were washed three times in ddH2O and separated by centrifuge, and later dried at room temperature for 24 hours. The MION's are characterized using a scanning electron microscope (SEM), transmission electron microscope (TEM), and X-ray diffraction (XRD), and physical property measurement system (PPMS) to verify that the MION's are within size, purity, and magnetic property parameters. After characterization, the MION's are placed in a 2 mL vile with a concentration of 5 mg/mL containing Luro-Bertani (LB) medium that has approximately 2.0 x 10<sup>8</sup> cells. The vile is inserted into DM100 Series Magnetic Hyperthermia Device that provides an alternating magnetic field. The magnetic field strength of 300 gauss is chosen with a frequency of 604 KHz for to reach 60°C and maintained for 30 minutes. The alternating magnetic field incites a magnetic moment on the MION's through dynamics of Brownian alignment of the particles and Néel rotation of their moments responsible for induction of the MION's and consequentially a heat shock effect in the cells creating conditions for benignancy and apoptosis that resulted in bacteria death.

#### SESSION II, POSTER Y-41

##### HIGH-RESOLUTION SINGLE-CELL GENOMICS OF MALARIA INFECTIONS

Simon Trevino, Texas Biomedical Research Institute

##### ABSTRACT

Single-cell genomics can provide a means to determine the genetic structure of complex communities of unicellular organisms. Genetic analysis of infections with malaria parasites are complicated by multiple parasite lineages. These cannot be unambiguously determined from bulk resequencing efforts, severely restricting the effectiveness of association studies, and of our understanding of gene flow through parasite populations. To better understand parasite ecology at the level of individual cells, we have developed a method to capture single-cell haplotypes. Our optimized approach uses fluorescence assisted flow cytometry to capture singly-infected red blood cells, followed by whole genome amplification and next generation sequencing. By focusing our single cell method on replicating parasites we improve the overall success rate of amplification reactions and routinely generate near complete capture of the 23Mb parasite genome (mean genome coverage 90.2%). Analysis of a Malawian infection demonstrates the power of single-cell genomics to determine unambiguous haplotype diversity and recent meiotic events, information that will aid public health efforts. NIH/NIAID A1110941-01A1, Ian Cheeseman Welcome Trust Grant 09999/Z/12/Z, Standwell Nkhoma

#### SESSION II, POSTER 42

##### A RETROSPECTIVE ANALYSIS OF THE EFFECTIVENESS AND LIMITATIONS OF CLINICAL DIAGNOSTIC TECHNIQUES FOR DENGUE FEVER IN RURAL PHILIPPINES

Jonathan Christopher Apostol Guzman, Texas Tech University Health Science Center, School of Medicine

##### ABSTRACT

Aside from being a major public health concern, dengue outbreaks pose a heavy economic burden on the public healthcare systems of endemic countries such as the Philippines. Lack of funding and the high patient burden in rural hospitals often means that diagnostic techniques are rudimentary and limited, forcing clinicians to rely on symptomatology and basic laboratory tests to arrive at a diagnosis of dengue fever. This study, a retrospective analysis of dengue cases in Milagros Albano District Hospital, Cabagan, Isabela, aims to explore the effectiveness and limitations of clinical diagnostic techniques for dengue fever. 63 cases were identified with a final clinical diagnosis of dengue fever. Laboratory values used by Milagros Albano District Hospital physicians in the diagnosis of dengue fever (hemoglobin and hematocrit, WBC count, platelet count) were collected from all patients and analyzed. Information on the duration of hospital stay and the patients' sex were also collected. Compared to highly regarded molecular diagnostic techniques in literature—NS1 ELISA, RT-PCR, and anti-DENV (dengue virus) IgG/IgM ELISA—use of routine clinical laboratory tests and hallmark symptomatology are very limited in diagnostic accuracy. Thrombocytopenia, leukopenia, and hemoconcentration had specificities of 20%, 76%, and 63% respectively, while sensitivities were found to be, 100%, 33% and 66%, respectively. In contrast the molecular techniques mentioned had specificities that ranged from 82.7-100% and sensitivities of 69.2-99.6%. Neither sex nor duration of hospitalization seemed to have any significant diagnostic relationship with DENV infection. These results along with a review of relevant literature suggests that dengue misdiagnosis happens at a very high rate due to lack of availability of proper molecular diagnostic techniques, and that this high rate of misdiagnosis may have profound economic consequences for the public healthcare system of the Philippines.

#### SESSION II, POSTER Y-43

##### DIRECT INFORMATION REVEALS GENE-DRUG CONNECTIVITY FROM PHARMACOGENOMIC DATA

Xian-Li Jiang1, Emmanuel Martinez-Ledesma2, Faruck Morcos1, 3

1Department of Biological Sciences, University of Texas at Dallas, Dallas, TX, USA.

2Department of Neuro-Oncology, The University of Texas MD Anderson Cancer Center, Houston, TX, USA.

3Center for Systems Biology, University of Texas at Dallas, Dallas, TX, USA.

With the growing volume of pharmacogenomic data, the connection between genetic variation and drug response becomes more accessible and can be used to benefit the optimization and personalization of cancer therapy. Crucial to the identification of drug response related genetic features is the ability to separate indirect correlations from direct correlations across abundant datasets with large number of variables. In this work, we estimated a global statistical model of pharmacogenomic data in cancer cell lines using direct coupling analysis (DCA), a powerful statistical inference method that has been successfully applied to protein sequence data to extract evolutionary signals that provide insights on protein structure, folding and interactions. By using DCA, we validated Direct Information (DI) as a metric of connectivity between protein pairs followed by the application of DI in revealing gene variation-drug response pairs. We infer important interactions observed in cancer-related pathways from proteomic data with positive prediction value of 72% and predict potential connectivities in cancer networks. We also identified known and potential connections for anti-cancer drugs and gene mutations using DI. We provide evidence that global models are more suitable to identify relevant interactions than local models that are traditionally used for data analysis. Our findings suggest that gene-drug connections predicted with direct couplings can expand our understanding of the effects of gene alterations on drug efficacies. This work is funded by the University of Texas at Dallas.





*Inaugural*

# Research Symposium

