9-2019

Research Symposium 2019, Health Disparities: Community Engagement

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

UTRGV | UT Health Rio Grande Valley | School of Medicine

Research Symposium 2019

HEALTH DISPARITIES: COMMUNITY ENGAGEMENT

THE UNIVERSITY OF TEXAS RIO GRANDE VALLEY
SCHOOL OF MEDICINE

3rd ANNUAL

RESEARCH SYMPOSIUM

September 13-14, 2019

School of Medicine and

McAllen Convention Center

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Poster Presentation Abstracts

MCALLEN CONVENTION CENTER MAP
(NO OUTSIDE FOOD OR DRINKS ALLOWED)

Event Sponsored by the Office of the Associate Dean of Research, School of Medicine
The University of Texas Rio Grande Valley

Andrew Tsin, Sr. Associate Dean of Research

Jay Morrow, Associate Dean of Clinical & Translational Research

Jennifer Cahn, Grant Research Officer

Jorge Teniente, Director of Special Programs

Veronica Vera, Program Manager

Isabel Nicasio, Program Coordinator

Special Guest and Sponsor:

University of Texas Health Science Center San Antonio

Planning Committees

Dr. Andrew Tsin, Associate Dean of Research, School of Medicine, UTRGV

Scientific Committee Chair: Dr. Candace Robledo, Assistant Professor, Population Health and Biostatistics, School of Medicine

Event Planning Committee Chair: Mr. Jorge Teniente, Chair, Director of Special Programs, ADR-SOM

Scientific Committee Members:

Dr. Candace Robledo, Chair, Assistant Professor, Population Health and Biostatistics, SOM

Dr. Matthew Johnson, Immediate Past-Chair, Associate Professor, Department of Human Genetics, SOM

Dr. Andrew Tsin, Associate Dean of Research, SOM

Dr. Juan Lopez Alvarenga, Assistant Professor of Research, Department of Human Genetics, SOM

Dr. Beatriz Bautista, Clinical Associate Professor, School of Nursing

Dr. Suad Ghaddar, Assistant Professor, Department of Health and Biomedical Sciences, College of Health Professions (COHP)

Ms. Sarah Miller, SOM Medical Student

Ms. Cindy Salazar-Collier, MPH CHES, Time Texas Regional Coordinator

Ms. Rose Timmer, Director of Healthy Communities in Brownsville

Event Planning Committee Members:

Mr. Jorge Teniente, Chair, Director of Special Programs, ADR-SOM

Mrs. Veronica Vera, Immediate Past-Chair, Program Manager, ADR-SOM

Dr. Jennifer Cahn, Grant Research Officer, ADR-SOM

Mr. Loren Clark, Program Manager, Dept. of Population Health & Biostatistics, SOM

Ms. Dorian Garcia, Finance Manager, Finance-SOM

Ms. Frances Garcia, Administrative Assistant, ADR-SOM

Ms. Elizabeth Lim, SOM Medical Student

Mrs. Isabel Nicasio, Program Officer, ADR-SOM

Mrs. Stephanie Sharpe, Access Services Librarian, SOM

Ms. Elma Vega, Administrative Assistant, Dept. of Population Health & Biostatistics


S173

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 3rd ANNUAL RESEARCH SYMPOSIUM

On behalf of our faculty, staff, and students, I am pleased to welcome you to the UTRGV School of Medicine's Third Annual Research Symposium. 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. With the theme of "Health Disparities: Community Engagement," this symposium aims to showcase the work done by researchers here in the Valley and beyond toward improving the health and well-being of the communities they serve and society as a whole.

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 on the quality and efficacy of clinical care and for 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
Executive Vice President, Health Affairs
Dean, School of Medicine

PROGRAM AGENDA

FRIDAY SEPTEMBER 13, 2019, AT THE SCHOOL OF MEDICINE, EDINBURG

12:00-5:00 P.M.
SOM LOBBY

EARLY CHECK-IN

2:45-3:00 P.M.
AUDITORIUM

OPENING REMARKS & WELCOME
BY DR. ANDREW DENTINO, VICE DEAN, SOM

3:00-5:00 P.M.
AUDITORIUM

COMMUNITY FORUM
SAUL RIVAS, MD, MSPH
MRS. ANGELA TANGUMA, MSN-FNP
MELISSA VALERIO, PHD, MPH
Healthy Families Community Engagement Program

5:05-6:30 P.M.
AUDITORIUM

KEYNOTE PRESENTATION
ELENA BASTIDA, PHD
COMMUNITY ENGAGEMENT, COLLABORATION, PARTNERSHIPS, AND ADVANCING RESEARCH: EXPERIENCES FROM THE FIELD

6:30-7:30 P.M.
SOM LOBBY

NETWORKING RECEPTION
CO-SPONSORED BY POPULATION HEALTH AND BIOSTATISTICS AND THE OFFICE OF THE ASSOCIATE DEAN OF RESEARCH, UTRGV SOM

PROGRAM AGENDA

SATURDAY SEPTEMBER 14, 2019 AT THE MCALLEN CONVENTION CENTER, MCALLEN

7:45-8:30 A.M.
MAIN LOBBY

REGISTRATION & NETWORKING BREAKFAST

8:30-8:45 A.M.
EXHIBIT HALL A

WELCOME

OPENING REMARKS BY DR. ANDREW DENTINO,
VICE DEAN, SOM, and
WELCOME BY MAYOR JIM DARLING

8:55-9:55 A.M.
ROOM 101

CONCURRENT SESSIONS
JEFFREY RING, PHD
THE IMPACT OF IMPLICIT BIAS ON HEALTHCARE

ROOM 102

DHARAM KAUSHIK, MD
TUMOR MICROENVIRONMENT IN RENAL CELL CARCINOMA
DEEPAK PRUTHI, MD
RISK ADAPTED SURVEILLANCE OF SMALL AND CYSTIC RENAL MASSES

ROOM 103

GLADYS MAESTRE, MD, PHD
COMMUNITY CHANGE FOR HEALTHY AGING

10:00-10:55 A.M.
EXHIBIT HALL A

POSTER VIEWING AND NETWORKING BREAK:
POSTERS TO BE JUDGED: HIGH SCHOOL, UNDERGRADUATE, MEDICAL STUDENTS, RESIDENTS, & CASE REPORTS

10:00 -11:00 A.M
ROOM 102

RACHEL PEARSON, MD
CARE AND JUSTICE IN AN UNJUST HEALTHCARE SYSTEM

11:00 A.M.-12:00 P.M.
ROOM 101

CONCURRENT SESSIONS
EMILY SPENCE, PHD, MSW
COMMUNITY ENGAGEMENT IN ACTION: CREATING OPPORTUNITIES TO PROMOTE HEALTH EQUITY

ROOM 102

PRATAP KUMAR, PHD
CAN NATURAL PRODUCTS ENHANCE CONVENTIONAL THERAPEUTIC STRATEGIES TO REDUCE PCa DISPARITY?

DAN HUGHES, PHD

CULTURAL ADAPTING AND INDIVIDUALLY TAILORING EXERCISE INTERVENTIONS FOR CANCER SURVIVORS INCLUDING THOSE IN SOUTH TEXAS-MEXICO BORDER

ROOM 103

CHELSEA CHANG, MD, FACP
STEPHANIE ONYECHI, MS2
SR. FATIMA SANTIAGO

THE ROLE OF A STUDENT-RUN CLINIC IN AN UNDERSERVED COMMUNITY: BEST PRACTICES FOR MEANINGFUL ENGAGEMENT

12:00-1:45 P.M.

EXHIBIT HALL A

LUNCH AND FLASH TALKS

2:00-3:00 P.M.

EXHIBIT HALL A

POSTER VIEWING AND NETWORKING BREAK

POSTERS TO BE JUDGED: GRADUATE STUDENTS,

POSTDOCTORAL STUDENTS, FACULTY & STAFF, PROGRAMS & COMMUNITY ORGANIZATIONS

2:00-3:00 P.M.

ROOM 102

LESLEY A. DURANT, JD, CHC, CHPC

FOUNDATIONS OF AN ETHICAL CLIMATE:

BUILDING AND MAINTAINING COMPLIANCE

CULTURE (1 CME Medical Ethics Credit)

3:00-4:00 p.m.

CONCURRENT SESSIONS

ROOM 101

SUDHA SESHADRI, MD, DM

ADOPTING A PERSONALIZED, PRECISION MEDICINE APPROACH TO PREVENTION, DIAGNOSIS AND TREATMENT OF DEMENTIAS

ROOM 102

DR. ROBIN LEACH, PHD

DIAGNOSING PROSTATE CANCER IN THE AGE OF PRECISION MEDICINE

KEITH ASHCRAFT, PHD

COPY NUMBER ANALYSES IN PRIMARY PROSTATE TUMORS REVEAL A POTENTIAL THERAPEUTIC TARGET, MALT1

ROOM 103

BELINDA REININGER, DrPH
LIH-LAN HU, MPH
JENNY NEWCOMB, MAOMD

CREATING SYSTEMS CHANGE IN THE RIO GRANDE VALLEY THROUGH A HEALTH DATA PLATFORM

4:00-4:30 P.M.

EXHIBIT HALL A

AWARDS & CLOSING REMARKS

THANK YOU!

LIST OF PARTICIPATING INSTITUTIONS

- Case Western Reserve University, Center for Proteomics and Bioinformatics, Cleveland, Ohio
- Children's Medical Center of Dallas, Dallas Texas.
- Clinica del Corazon, Reynosa, Tamaulipas, Mexico
- Diabetes and Endocrinology Institute, Doctors Hospital at Renaissance
- John Hopkins School of Medicine, Department of Pediatrics
- Federal Institute of Education, Science and Technology of Sertão Pernambucano, IFSertão-PE, Floresta, Pernambuco, Brazil
- Federal University of Agriculture, Department of Pure and Applied Zoology, Abeokuta, Nigeria
- Healthy Communities of Brownsville
- Health Resources in Action, Boston, Massachusetts
- Harvard Medical School, Boston, Massachusetts
- Hospital General de Mexico, Dr. Eduardo Liceaga, Human Genetics Department, Mexico, City, Mexico
- *Innbiogem, SC of National Laboratory of Specialized Services of Research, Development, and Innovation for Pharma and Biotech Industries (LANSEIDI)-CONACyT, Monterrey, México.*
- *Institute for Research and Development, DHR Health*
- Instituto Politécnico Nacional, Centro de Biotecnología Genómica, Reynosa, Tamaulipas, México
- Nuestra Clinica del Valle, Rio Grande Valley, Texas
- MD Anderson Cancer Center, Department of Diagnostic Radiology
- Oswaldo Cruz Foundation, FIOCRUZ-PE, Recife, Pernambuco, Brazil
- South Texas Academy for Medical Professions, Olmito, Texas
- Tecnológico de Monterrey, School of Medicine and Health Sciences, Departamento de Bioquimica y Medicina Molecular, Monterrey, Nuevo León, México
- Texas A&M Health Sciences Center Rangel College of Pharmacy
- Pan-American School of Reynosa
- Ponce Health Sciences University, School of Medicine, Ponce, Puerto Rico
- South Texas Academy for Medical Professions
- South Texas College, Department of Biology
- South Texas Veteran Health Care System
- Tougaloo College, Tougaloo, Mississippi
- Unidos Contra la Diabetes, Weslaco, Texas
- Universidad de Nuevo Leon, Departamento de Bioquimica y Medicina Molecular, Monterrey Nuevo Leon Mexico.
- Universidad Autónoma de Nuevo Leon y Hospital Universitario "Dr. Jose E. Gonzalez", Servicio de Oncologia, Clinica de Prevencion y Detección Temprana de Cancer, Facultad de Medicina, Nuevo León, México
- *Universidad Autónoma de Nuevo León y Hospital Universitario "Dr. José Eleuterio González", Servicio de Oncología, Centro Universitario Contra el Cáncer (CUCC).*
- Universidad México Americana del Norte AC, Escuela de Medicina, Reynosa, Tamaulipas, México

- Universidad Autónomo de Tamaulipas, Departamento of Molecular Biology, Laboratorio de Seguridad Alimentaria, Unidad Multidisciplinary, Reynosa Aztlan.
- Universidad La Salle Victoria, Campus de Ciencias de la Salud “Dr. Rodolfo Torre Cantú,”Ciudad Victoria, Tamaulipas, México
- University of Memphis, Memphis, Tennessee
- University of Tennessee Health Science Center, Department of Pharmaceutical Sciences, Memphis TN.
- University of Texas Medical Branch, Department of Radiology
- University of Texas Health Science Center at Houston
    - School of Public Health, Brownsville, Texas
    - School of Public Health, Dallas, Texas
    - Department of Epidemiology, Human Genetics and Environmental Sciences
- University of Texas MD Anderson Cancer Center, Department of Diagnostic Radiology, Houston, Texas
- University of Texas Rio Grande Valley
    - College of Engineering and Computer Science
        - Department of Manufacturing and Industrial Engineering
        - Department of Mechanical
    - College of Health Affairs
        - Department of Health and Biomedical Sciences
        - Department of Occupational Therapy
    - College of Liberal Arts
        - Department of Psychological Science
        - Department of Public Affairs & Security Studies
        - Department of Sociology and Anthropology
    - College of Sciences
        - Department of Biology
        - Department of Chemistry
        - School of Mathematical & Statistical Sciences
    - Robert C. Vackar College of Business & Entrepreneurship
        - Department of International Business
    - School of Medicine
        - Department of Family Medicine
        - Department of Family and Community Medicine
        - Department of Human Genetics
        - Department of Internal Medicine
        - Department of Immunology and Microbiology
        - Department of Medical Education
        - Department of Molecular Science
        - Department of Neurosciences
        - Department of Obstetrics & Gynecology
        - Department of Population Health and Biostatistics
        - Department of Psychiatry and Neurology
        - Department of Surgery
        - South Texas Diabetes and Obesity Institute
- University of Tennessee Health Science Center, Memphis, Tennessee
- University of Texas Health Science Center San Antonio, School of Medicine
    - Department of Epidemiology & Biostatistics
    - Department of Urology
    - Department of Geriatrics, Gerontology and Palliative Medicine

- University of Texas Southwestern Medical Center, Dept. of Radiation Oncology
- Technologico de Monterrey, School of Engineering and Sciences, Monterrey, Mexico
- Technologico de Monterrey, Escuela de Medicina y Ciencias de la Salud
- Vitagénesis, S.A. de C.V., Monterrey, México
  - Biotechnology Laboratory
  - Genetics Laboratory

SPECIAL THANKS!

Abstract Reviewers

Presentation Judges

Oral Session Moderators

Staff Volunteers

Student Volunteers

Elena Bastida, Ph.D.

Professor and Chair of the Department of Health Promotion and Disease Prevention, Florida International University

1 CME CREDIT

"Community Engagement, Collaborations, Partnerships, and Advancing Research: Experiences from the field."

FRIDAY

September 13, 2019

Time: 5 6 p.m.

School of Medicine Auditorium Edinburg

2019 KEYNOTE SPEAKER

This section has been approved for 1 CME Credit

Elena Bastida, Ph.D.

Presentation Title: Community Engagement, Collaborations, Partnerships, and Advancing Research: Experiences from the Field

Biography: Elena Bastida, Ph.D., is a Professor and Chair in the Department of Health Promotion and Disease Prevention, Florida International University.

Dr. Elena Bastida's research focuses on aging, the life course, health disparities, religion, population, and community health. She led the 12-year National Institutes of Health (NIH) supported Border Epidemiologic Study on Aging (BESA) and, with continuous NIH support, conducted research on religion and aging and community based participatory research on obesity and diabetes. Though, substantively, her research topics have varied, she has maintained her focus on Latino populations and health disparities.

Both her teaching and her mentoring have received statewide and national recognition with two national role model awards and, most recently, the University Graduate School Mentorship Award and the Florida McKnight Foundation Mentor Award. In 2009, she received the Public Health Hero Award from Research America. Dr. Bastida is the past president of the Population Research Committee of the International Sociological Association.
Her research has been published in the American Journal of Public Health, The Gerontologist, The Journal of Gerontology, Health Economics, Journal of Scientific Study of Religion, and Diabetes Care among others.

Education

- National Institute of Mental Health, Postdoctoral Fellowship
- The University of Kansas, Ph.D.
- Kansas State University, B.S.

INVITED PLENARY SPEAKERS

Jeffrey Ring, Ph.D.

Principal, Los Angeles, CA, Health Management Associates

Presentation Title: THE IMPACT OF IMPLICIT BIAS ON HEALTHCARE

Dr. Jeffrey Ring is a clinical health psychologist and author who knows culturally responsive integrated healthcare from the inside out. He is an executive leadership coach and assists leaders and teams in productive functioning toward effectiveness and competitive advantage. Jeffrey is a champion for healthcare practitioner vitality and is skilled in supporting teams in mindful reflection on creative approaches to self-care and wellness enhancement. For 19 years he served as the director of behavioral sciences and cultural medicine at the family medicine residency program at White Memorial Medical Center in East Los Angeles. There he worked in a multi-disciplinary team providing woven behavioral and primary care health services to a predominately Spanish-speaking underserved population. He is a clinical professor of family medicine at the Keck School of Medicine at the University of Southern California and has clinical experience with patients along the lifespan including geriatrics. At HMA, Jeffrey is poised to help clients with an array of initiatives, including integrated behavioral care in hospital and primary care, healthcare practitioner leadership and wellbeing, the delivery of quality culturally responsive care within Patient-Centered Medical Homes and Federally Qualified Health Centers, and the enhancement of medical education to prepare health practitioners for successful practice in a changing healthcare environment. He has a keen interest in how physician education in advanced care planning can help achieve the Triple Aim. In his previous role at White Memorial Medical Center, Jeffrey was responsible for providing bilingual (Spanish) mental health services in an integrated setting, and he taught family medicine residents the skills of evaluation of, and intervention with, psychosocial issues in the context of primary care delivery. This included compassionate doctor-patient communication, substance use screening and intervention, mind-body medicine, and stress management. During his career, Jeffrey has focused on the elimination of health disparities, with an emphasis on the role of medical education and the provision of outstanding care in underserved communities. He is the first author of *Curriculum for Culturally Responsive Health Care: The Step-by-Step Guide for Cultural Competence Training*, a book published by Radcliffe Oxford in 2008. Jeffrey has served in leadership positions in the Group on Minority Health and Multicultural Education within the Society of Teachers of Family Medicine and in the Society for the Psychological Study of Culture, Ethnicity and Race within the American Psychological Association. He has lectured and published widely on culturally responsive healthcare, medical education, and physician wellbeing. Jeffrey lives with his family physician wife, Beth, and their twin sons attend college back East.

Sudha Seshadri, M.D., DM

Robert R. Barker Distinguished University Professor of Neurology, Psychiatry and Cellular and Integrative Physiology / Senior Investigator, The Framingham Heart Study / Founding Director, Glenn Biggs Institute for Alzheimer's & Neurodegenerative Diseases

Presentation Title: ADOPTING A PERSONALIZED, PRECISION MEDICINE APPROACH TO PREVENTION, DIAGNOSIS AND TREATMENT OF DEMENTIAS

Dr. Sudha Seshadri completed her M.B.B.S. from the Christian Medical College, Madras University, and her M.D. in internal medicine and D.M. in neurology from the All India Institute of Medical Sciences, New Delhi, India. Additionally, she has completed a residency in neurology at the Boston University School of Medicine and a fellowship in the neurobiology of Aging and Alzheimer Disease at the University of Massachusetts Medical Center. She has previously worked as assistant professor of neurology at the All India Institute of Medical Sciences and professor of neurology and attending neurologist at the Boston University School of Medicine. As founding director of the Glenn Biggs Institute for Alzheimer's & Neurodegenerative Diseases, Dr. Seshadri will oversee, integrate, and coordinate all activities of the Biggs Institute, which will share the space of UT Health's Barshop Institute for Longevity and Aging Studies. Dr. Seshadri enjoys a superb reputation in both science and clinical care and is a recognized thought leader in Alzheimer's disease, having recently co-authored position papers disseminated by the National Academy of Sciences on Preventing Cognitive Decline and Dementia: A Way Forward, and by the American Heart Association with a paper titled "Defining Optimal Brain Health in Adults." She has lectured extensively, nationally and internationally, on Alzheimer's disease, dementia, and the genetics of stroke and vascular brain injury. She is a senior investigator for the seminal Framingham Heart Study, has had peer reviewed research continuously funded by the National Institutes of Health for 10 years, and currently serves as the principal investigator on eight NIH U01 or R01 grants.

Emily Spence-Almaguer, Ph.D., MSW

Associate Dean for Community Engagement & Health Equity and Associate Professor, University of North Texas Health Science Center

Presentation Title: COMMUNITY ENGAGEMENT IN ACTION: CREATING OPPORTUNITIES TO PROMOTE HEALTH EQUITY

Education & Experience:

I received my Bachelor's and Master's degrees in Social Work from Florida State University and my PhD in Social Welfare from Florida International University. My direct practice experience includes victim advocacy and counseling services provided to individuals who have experienced intimate partner violence, sexual violence and/or stalking. I am also experienced in the development, administration and evaluation of social service programs. I have extensive experience in the assessment of community needs and assets, as well as in conducting program and community-wide evaluations. Prior to joining UNT Health Science Center, I served as Assistant Professor and Assistant Dean for Research and Community Outreach at the University of Texas Arlington School of Social Work. I also served as an adjunct professor at Florida International University. Teaching Areas & Public Health Interests: I have taught undergraduate, Masters and PhD courses in research design, evaluation, community and macro practice, basic statistics, qualitative and quantitative methods, intimate partner violence and grant proposal development. I have served as a PhD mentor and have chaired doctoral dissertations. I also provide training to professionals in interdisciplinary and practice-based settings.

Professional Activities & Awards:

I have served on the board of directors for local non-profit organizations, and I am currently the Community Outreach Core Director for the Texas Center for Health Disparities, an NIH (National Institutes of Health) Center of Excellence. I have served as a coach and mentor for the National Research Mentors Network (NRMN) and the Steps Toward Academic Research (STAR) Fellowship program. I have received several awards and honors, including the Charles Perry Visionary Award from the Florida International University Alumni Association.

Scholarly Interests:

I am a community-engaged scholar in the areas of program evaluation, interpersonal violence, poverty, homelessness, women's health, lifestyle interventions and community assessment. I collaborate with groups and organizations on the design of new programs, as well as the collection and analysis of data that can be used to improve or develop solutions for a healthier community. As a program evaluator, I have assessed numerous

public health concerns, including breast cancer, asthma, cradle to career development, violence, trauma, economic well-being, post-incarceration re-entry and women's wellness. I am particularly interested in interventions that are strengths-based and support human resiliency, such as Solution-Focused therapies, Motivational Interviewing and asset-based community development.

University of Texas Health Science Center San Antonio
Presentation Speakers

Ronald Rodriguez, MD, PhD.
Chairman of Urology Department,
DHR Endowment Chair

Dr. Ronald Rodriguez is a clinician-scientist, whose body of work includes the development of the first genetically engineered oncolytic adenovirus, the study of histone deacetaylase inhibitors, the study of the biology of prostate cancer including targeted therapeutics and the role of microRNA in the development of androgen independent disease, the study of immunotherapeutics for urologic cancer, the development of near infrared technology to visualize live prostate cancer cells in real time during surgical resection, the clinical development of cryotherapy as a minimally invasive technique for urologic cancer, and the clinical development of a center of excellence for locally advanced kidney cancer, with tumor thrombus involving the renal vein and inferior vena cava. He has also worked as an entrepreneur, having developed multiple patents for gene therapy and founded a startup biotechnology company, as an physician educator functioning as the urology residency program director at Johns Hopkins for 7 years, as an administrator running a large research enterprise for more than 15 years, a clinical department for 5 years, and a medical school for one year.

Dharam Kaushik, MD

Dr. Dharam Kaushik, MD is an Associate Professor and program director of urologic oncology fellowship in the Department of Urology at the University of Texas Health San Antonio. He finished his medical school in India and performed basic science research at Rosewell Park Cancer Institute, Buffalo, New York. He completed his Urology surgical residency at the University of Nebraska Medical Center, Omaha, Nebraska and fellowship in urologic oncology at Mayo Clinic, Rochester, Minnesota. His primary research interests include renal cell carcinoma with tumor thrombus, detection of novel biomarkers, newer therapeutic targets in renal cell carcinoma, evaluating effect of exercise (Yoga) in urologic cancer.

PRESENTATION TITLE: TUMOR MICROENVIRONMENT IN RENAL CELL CARCINOMA

To show data on tumor microenvironment in surgically resected kidney cancer with tumor thrombus patients. The goal of our research is to identify prognostic biomarker and potential therapeutic target in advanced kidney cancer.

Deepak K. Pruthi, MD, FRCSC

Dr. Deepak K. Pruthi MD, FRCSC is an Assistant Professor in the Division of Urologic Oncology, Department of Urology at the University of Texas Health San Antonio. Born in Texas he moved gradually moved north ultimately settling down in Canada where he spent his formative years. He graduated from the University of Winnipeg (BSc & BA). He went to medical school at the University of Manitoba where he obtained his MD and a medical research degree (BSc Med). He completed his Urology surgical residency at the University of Manitoba. He then moved back to San Antonio to complete his Society of Urologic Oncology-approved fellowship in Urologic Oncology and obtained a Master in Clinical and Translational Investigation. His primary research interests include renal insufficiency, anatomic and pathologic-based predictive modeling, studying oncologic outcomes, and examining the role of systemic therapy in early/locally advanced stages of urologic cancer.

PRESENTATION TITLE: RISK ADAPTED SURVEILLANCE OF SMALL AND CYSTIC RENAL MASSES

The incidental small renal mass presents a conundrum for the patient and the provider. Both active surveillance/delayed intervention and treatment carry their own inherent risks. However, an individualized plan can be optimized by an understanding of the underlying biology and diagnostic uncertainty balanced against the outcomes of renal function, oncologic, and overall survival.

Rachel Pearson, M.D. Ph.D.

Rachel Pearson, M.D., Ph.D., is an Assistant Professor in the Department of Pediatrics and the Center for Medical Humanities & Ethics at UT Health San Antonio. Dr. Pearson authored a memoir titled "No Apparent Distress: A Doctor's Coming-of-Age on the Front Lines of American Medicine," and her writing on humanism and health appears in publications including the New Yorker, the Texas Observer, Texas Monthly, and the New York Review of Books. She received an undergraduate degree from the University of Texas at Austin and went on to earn an M.D. and a Ph.D. in medical humanities from the University of Texas Medical Branch in Galveston. She completed a pediatrics residency at Seattle Children's Hospital through the University of Washington. As a bilingual, fifth-generation Texan, Dr. Pearson is excited to return home and advocate for the health of Texas kids.

PRESENTATION TITLE: CARE AND JUSTICE IN AN UNJUST HEALTHCARE SYSTEM

Physicians, nurses, and allied health professionals work in complex institutions. Here in Texas, many of us have benefitted from training that is subsidized by the state and now are paid by state institutions. Physician residency programs are also funded by the federal government. Our obligations to and entwinement with our government can create moral distress--confusion, sadness, anger, and questions about the morality of our work--when we are called upon to care for patients whom we feel have been harmed (or inadequately helped) by unjust state or federal policies. Some respond to this distress by working to change policy. But most of us are not trained in or comfortable with the world of policy, and must find ways to continue caring for the patients most in need. How, then, do we continue our work in a morally coherent way and maintain our sense of moral selves? This talk suggests that a framework of virtue ethics, and a deeper understanding of the history of justice as a virtue, may assist us.

Pratap Kumar, PhD

Dr. Pratap Kumar, Ph.D., is a tenured Professor in the Department of Urology with joint appointments in the Departments of Molecular Medicine and Pharmacology, and graduate faculty in the School of Biomedical Sciences at UT Health San Antonio. He is also co-leader of the cancer prevention program of the NCI designated Cancer Center, and a Research Health Scientist at the South Texas Veterans Health Care System; San Antonio, Texas. His research program is focused on the molecular and cellular mechanisms involved in genitourinary and gastrointestinal pathogenesis. Some of the seminal contributions from his research program include the development of natural products as potential adjuvants for cancer therapy and molecular marker signature for cancer prognosis. Basic science discoveries from his laboratory have been translated to the clinic. Current projects include deciphering the role of (i) ribosomal protein S6K and histone deacetylases in chemo-radiosensitization and (ii) STAT3/survivin in stellate-cancer cell interactions as an intervention strategy for treatment of solid tumors including prostate and pancreatic.

PRESENTATION TITLE: CAN NATURAL PRODUCTS ENHANCE CONVENTIONAL THERAPEUTIC STRATEGIES TO REDUCE PCA DISPARITY?

The rise in cancer incidence and mortality in developing countries together with the financial burden associated with of current cancer therapy demands a closer look at alternative ways to overcome this growing global healthcare problem. Epidemiological evidence for the association between cancer and diet and the long latency of most cancer progression have led to active exploration of natural compounds from different sources in both preclinical and clinical settings. However, lack of compelling scientific evidence limits their utility as agent(s) for cancer management. Dr. Kumar's research program focuses on developing natural compounds for cancer management and he will discuss how natural products can be developed as potential adjuvants for cancer therapy for improving treatment outcome.

Daniel Hughes, PhD

Dr. Hughes earned a Bachelor of Arts degree in Biology from the University of Texas at Austin. After graduation, he worked as a chemical engineer at Dow Chemical in Freeport Texas, returning to graduate school after 23 years in industry. He earned a Masters of Education degree in Motor Behavior and a PhD in Kinesiology from University of Houston, with a sports/exercise psychology specialty. Upon receiving his doctorate, he completed a postdoctoral fellowship at U.T. M. D. Anderson Cancer Center in the Department of Behavioral Sciences. During his postdoctoral training, he led the implementation of the exercise testing and monitoring laboratories in the Behavioral Research and Treatment Center. After his postdoctoral fellowship, he joined the Institute for Health Promotion Research at the University of Texas Health Science Center in San Antonio where he leads the "Muevete Mas laboratory". His research focuses on exercise interventions for cancer survivorship to address cancer related health disparities. Dr. Hughes has been funded by National Cancer Institute, and sits on several key committees including the GAP4 Movember Steering Committee for a worldwide exercise initiative for metastatic prostate cancer survivors. Currently, in partnership with colleagues from UTH-SA, Rice University, U.T. M. D. Anderson Cancer Center and St. Mary's University; his research is focusing more on testing a holistic mind-body interactive model to mitigate the negative effect on stress for a primary and tertiary prevention. Dr. Hughes has over 30 publications in the area of exercise and cancer prevention, served as grant reviewer for NCI, and continues to serve as a reviewer for several of top tier journals in cancer prevention. Dr. Hughes is both an American College of Sports Medicine certified Clinical Exercise Physiologist® and American Heart Association Advanced Cardiovascular Life Support (ACLS) certification.

PRESENTATION TITLE: CULTURAL ADAPTING AND INDIVIDUALLY TAILORING EXERCISE INTERVENTIONS FOR CANCER SURVIVORS INCLUDING THOSE IN SOUTH-TEXAS MEXICO BORDER.

Properly designed exercise programs can improve cancer survivors clinical outcomes and overall quality of life. Despite exercise's plethora of physical and mental benefits, most cancer survivors do not meet the guidelines for physical activity. Culturally adapting and individual tailoring to the motivational characteristic of cancer survivors especially that address special cultural barriers and individual factors are promising methods to increase exercise behaviors in cancer survivor groups including those on the Texas-Mexico border region. Here studies using such techniques are presented including

world-wide global exercise initiative for prostate cancer survivors, a border specific intervention for Mexican-American breast cancer survivors and details of a new pilot intervention designed for any adult cancer survivor.

Lesley Anne M. Durant, JD, CHC, CHPC

Lesley Anne M. Durant, JD, CHC, CHPC. Lesley Anne is the Vice President, Chief Compliance & Privacy Officer for DHR Health in Edinburg, Texas. She is a licensed attorney in the state of Michigan and is certified in Healthcare Compliance and Healthcare Privacy Compliance by the Compliance Certification Board. Lesley Anne graduated cum laude from both Central Michigan University and Michigan State University College of Law and holds a Bachelor's degree in History and a Juris Doctor. Lesley Anne is a member of the Health Care Law Section of the ABA, the Health Care Compliance Association, and speaks on the topics of Ethics, Compliance, and Health Care Law.

PRESENTATION TITLE: FOUNDATIONS OF AN ETHICAL CLIMATE: BUILDING AND MAINTAINING COMPLIANCE

Foundations of an Ethical Climate: Building and Maintaining a Compliance Culture. This session will provide an overview of the factors that make up an ethical climate and how that climate drives organizational culture towards successful compliance. The session also includes information on how to develop and promote an ethical culture and support internal reporting of wrongdoing in an organization.

Keith Ashcraft, PhD.

Dr. Ashcraft received his Bachelors of Science in biology in the piney woods of east Texas at Stephen F. Austin State University. From there he traveled west and completed his PhD at the UT Health San Antonio in 2017. Dr. Ashcraft is currently a postdoctoral fellow in the Urology department under the mentorship of Dr. Denise O'Keefe where he is studying the role of the essential vitamin B9 (folate) in contributing to aggressive prostate and kidney cancer. This research hopes to inform the nutritional decisions of those who have or are at a higher risk of these cancers. As a SABER*IRACDA scholar, Dr. Ashcraft hopes to continue high impact research while also gaining valuable tools to better communicate scientific concepts and to become an effective educator and mentor.

PRESENTATION TITLE: COPY NUMBER ANALYSES IN PRIMARY PROSTATE TUMORS REVEAL A POTENTIAL THERAPEUTIC TARGET MALT1

Utilizing DNA isolated from primary prostate tumors with associated clinical data, we performed analysis on copy number variation within chromosome 18 and outcome. A region of chromosomal gain containing the gene MALT1 was identified in a subset of primary tumors that progressed to metastasis. MALT1, a key member in the NF-κB pathway and driver of cancer in lymphomas, represents a novel therapeutic target for certain aggressive prostate cancers.

Robin Leach, PhD

Dr. Robin Leach is a Professor in the Department of Cell System and Anatomy and the Department of Urology, where she also serves as the Division Chief of Research. Dr. Leach has worked in the area of cancer early detection and identifying biomarkers for prostate cancer for the nearly 20 years and is an active member of the National Cancer Institute's Early Detection Research Network. In addition, Dr. Leach is the Associate Director for Education for the Mays Cancer Center at the University of Texas Health San Antonio, one of three National Cancer Institute Designated Cancer Centers in Texas.

PRESENTATION TITLE: DIAGNOSING PROSTATE CANCER IN THE AGE OF PRECISION MEDICINE

Early detection of prostate cancer can reduce the morbidity and mortality of this disease. The presentation will discuss incorporating new screening methods to identify men with high grade prostate cancer whose disease is currently undetected since they have "normal" serum levels of prostate specific antigen (PSA). By identifying the prostate cancer before the PSA rises above the normal levels, the tumor is less likely to have spread outside the prostate. These methods focus on the newest tools including urinary biomarker, genetic risk score and magnetic resonance imaging.

UTRGV Plenary Speakers

COMMUNITY CHANGE FOR HEALTHY AGING

Sofia Homes, High School Student, South Texas Academy for Medical Professions; Rose Timmer, Executive Director at Healthy Communities of Brownsville Inc.; Dr. Noe Garza, Research Associate, Dept. of Neuroscience, UTRGV SOM: and Dr. Gladys E. Maestre, Department of Neuroscience, and Director of the RGV AD-RCMAR

Demographics in the U.S. are clear: the number of older adults will double by 2050, but this change will arrive a decade earlier in Hispanic communities. Government leaders, service providers, and older adult advocates acknowledge the community as a unit and, as such, it will benefit tremendously from promoting healthy aging. Because Alzheimer´s disease does not have a cure yet, promoting healthy aging is one of the goals of the University of Texas Rio Grande Valley - Alzheimer´s Disease Resource Center for Minority Aging Research (AD-RCMAR). Initiatives of our AD-RCMAR are multilevel and multidisciplinary, all focused on building strengths and resources within the community, fostering co-learning, building capacity among partners, and integrating and balancing knowledge generation and intervention for mutual benefit. It is important for youth to develop healthy lifestyles in order to stave off many of the health problems and diseases that will affect them throughout their lifetime if they do not form healthy habits while young. At the same time, older adults can contribute significantly when actively seeking community changes that support healthy lifestyles across the lifespan. In this plenary, we will share and discuss efforts and outcomes, from facilitating collaborative, equitable partnerships focusing on multiple determinants of health to promoting healthy aging. The three speakers will address: 1) the role of higher education institutions to advance healthy lifestyles in Latino youth, from the perspective of a high school student; 2) how community mobilization led by seniors citizens is reshaping the Rio Grande Valley; and 3) how dynamic and space-based mapping are informing longevity in our communities.

THE ROLE OF A STUDENT-RUN CLINIC IN AN UNDERSERVED COMMUNITY: BEST PRACTICES FOR MEANINGFUL ENGAGEMENT

Student Doctor Stephanie Onyechi, UTRGV SOM; Sister Fatima Santiago; Chelsea Chang MD, FACP, UTRGV SOM

Abstract: Community engagement, like any engagement, involves two parties taking risks, but with the potential for great reward. We'd like to tell you about our community engagement project - the UTRGV SOM student-run clinic (SRC) with the people of Penitas. We'll present the role of an SRC in an underserved community and give specific best practices. You'll hear from a second-year medical student about the process of selecting a community, identifying its needs and the demographics of the patients served. A leader from that community and non-profit partner will share the struggles and successes the community faced throughout the planning and the year the clinic has been operational. Lastly, from a School of Medicine faculty perspective, learn how the SRC helps to fulfill the mission of the school and potential educational opportunities in the future.

CREATING SYSTEMS CHANGE IN THE RIO GRANDE VALLEY THROUGH A HEALTH DATA PLATFORM

Lih-Lan Hu, Program Manager, Unidos Contra la Diabetes; Jenny Newcomb, Executive Director, Unidos Contra la Diabetes; Salomon Torre, Program Manager, Unidos Contra la Diabetes; Belinda Reininger, Dean, University of Texas Health Science Center at Houston, School of Public Health, Brownsville Regional Campus

Purpose: Unidos Contra la Diabetes (UCD), a diabetes prevention collective impact initiative implemented a data platform to share local common data of programs, results of local research, and clinical data sets, as a free resource for partners seeking to improve public health. The ultimate goal is to change systems, with a user-friendly platform to find and compare health indicators and social determinants of health at local, county, state, and national levels. **Description:** Conduent, the platform vendor, customized their commercial platform, and provided training that engaged UCD partners. UCD has conducted multiple events to promote this dashboard with the local data and tools contained in it as a community resource to encourage use and willingness to share summary data. Progress and disparities can be identified, and the impact or lack thereof can be measured and strategically addressed. Support around UCD Health Connect was an opportunity for the early UCD partners to make organizational systems changes. These have resulted in community level attitude and systems changes. **Lessons Learned:** Data can motivate change at the community level and with partners. However, implementation of technology takes time to gain acceptance and commitment for it to be integrated into a system. A phase-in period will require an investment in funds to facilitate meetings and training and for outreach activities to develop trusting relationships. **Recommendations:** Sustainable systems change requires strategic planning and funding for at least 2-3 years. Starting early in the process to consult with partners, search for funding to enable outreach training and evaluation plans to be incorporated.

Community Forum

HEALTH FAMILIES COMMUNITY PROGRAM

Saul Rivas, MD, MSPH
Angela Tanguma, MSN-FNP
Melissa Valerio, PhD, MPH

There are significant health disparities across the United States, Texas, and Hidalgo County. Women and more specifically, minority women carry a significant burden to these disparities. Health issues in this group include unintended pregnancies, lack of education, and financial stability to obtain the proper prenatal or medical care. Although the teen pregnancy rate overall has been declining over the last few years, Texas has the 4th highest teen pregnancy rate in the country (Guttmacher Institute, 2016). These numbers cause devastation not only to the women facing the situation but to the state as a whole due to economic and social burdens. The unintended pregnancy rate in the county has also decreased recently, but remains highest for women of low socio-economic status placing undue burden on this population. Unintended pregnancies may lead to lack of proper prenatal care and therefore increase maternal and infant morbidity and mortality. The infant death rate in Hidalgo County is 5.1 per 1,000 live births, and fetal death rate is 5.0 per 1,000 live births (Texas Department of State Health Services, 2013). The uptake of prenatal care is also substantially lower in Hidalgo County with only 64.2% of women receiving prenatal care during the first trimester (Texas Department of State Health Services, 2013). The Healthy Families Project is collaboration between the Department of Pediatrics and the Department of Obstetrics & Gynecology at UTRGV with the goal of addressing the disparities associated with maternal and infant morbidity and mortality in Hidalgo County. This collaboration includes community stakeholders, medical providers, and community health workers who actively engage patients in various colonias. Over the last 20 months, we have successfully developed a LARC mobile clinic through collaboration with the UniMovil team. Additionally, we have started identifying patients in early pregnancy with the goal of helping them establish prenatal care. Furthermore, we have started to provide full scope gynecological services to patients through collaboration with the UT Health RGV San Carlos Clinic. The objectives of our presentation will be to describe the gaps in access to care that affect maternal and infant morbidity and mortality, discuss our community engagement activity in the colonias, discuss the clinical services including the LARC UniMovil and UT Health RGV San Carlos clinic, and present the challenges and future directions of our efforts.

FLASH TALKS

REPETITIVE DNA – A CLASSICAL CAUSE OF DISEASE REINVIGORATED BY APPLICATION OF NEW DETECTION TOOLS IN WHOLE GENOME SEQUENCE DATA.

Blackburn NB[1], Glahn DC[2,3], Bennett MF[4,5], Peralta JM[1,6], Charlesworth JC[6], Knowles EE[2], Mathias SR[2], Kumar S[1], Leandro AC[1], Olvera RL[7], Fox PT[8,9], Duggirala R[1], Curran JE[1], Bahlo M[4,5], Blangero J[1] 1. Department of Human Genetics, and South Texas Diabetes and Obesity Institute, School of Medicine, University of Texas Rio Grande Valley, Brownsville, TX, USA, 2. Department of Psychiatry, Boston Children's Hospital and Harvard Medical School, Boston, MA, USA, 3. Olin Neuropsychiatry Research Center, Institute of Living, Hartford Hospital, Hartford, CT, USA, 4. Population Health and Immunity Division, the Walter and Eliza Hall Institute of Medical Research, Parkville, VIC, Australia, 5. Department of Medical Biology, University of Melbourne, Parkville 3010, VIC Australia, 6. Menzies Institute of Medical Research, University of Tasmania, Hobart, TAS, Australia, 7. Department of Psychiatry, University of Texas Health Science Center San Antonio, San Antonio, TX, USA, 8. Research Imaging Institute, University of Texas Health Science Center at San Antonio, San Antonio, TX, USA, 9. Department of Radiology, University of Texas Health Science Center at San Antonio, San Antonio, TX, USA

Background: Short-tandem repeats (STRs) are DNA variations of clinical importance to neurological disorders. New bioinformatic methods that can measure STRs in existing whole genome sequence (WGS) data have been developed in recent years. The potential for these tools to assess clinically relevant STRs has not been explored in large families, nor extensively in Mexican Americans. **Methods:** We applied two current methods of STR measurement, ExpansionHunter and exSTRa, to 2097 genomes from the San Antonio Family Study (SAFS). SAFS is a randomly ascertained, longitudinal pedigree based cohort of Mexican Americans. Individuals in SAFS have been evaluated multiple times since the study conception in the 1990s, including comprehensive neuroimaging and neurocognitive assessments for 1445 participants. We focused our attention in this work on profiling 21 clinically relevant STRs. We examined their inheritance within families, and are assessing their effects on relevant neurological measures in carriers. **Results**: We identified 12 STR expansions at the SCA8 locus in 9 families and 29 carriers of the SCA10 expansion in 10 families. At pathogenic lengths these STRs cause the development of autosomal dominant spinocerebellar ataxia 8 and 10, respectively. While SAFS does specifically record ataxias, this disease may be undiagnosed in this clinically underserved minority group. We hypothesized that, in the absence of overt ataxia, we will detect associations with ataxia relevant measures in carriers. **Conclusions:** STRs are an important form of clinical genetic variation. Here we show inheritance of clinically relevant STRs in Mexican American families and ongoing work will characterize whether these STRs associate with disease related measures.

ARCHITECTURAL CHANGES OF THE SPINAL CORD AFTER INJURY

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Background:

A spinal cord injury (SCI) to the cervical spine, termed tetraplegia, remains a severely disabling condition affecting nearly 174,000 individuals in the United States. Current rehabilitation strategies may help patients, but due to the lack of personalization, progress is often hindered. To improve therapy, we must determine whether certain biomarkers, such as neuronal sparing, contribute to increased therapeutic benefit. Our goal was to evaluate the changes in the neuronal sparing in the spinal cord and determine its influence on therapeutic recovery potential. **Methods:** We utilized T2-

weighted images to observe the spinal cord in patients with an SCI and healthy controls. "Spinal Cord Toolbox", an opensource software, was used to map and digitally straighten the spinal cords. The cross-sectional area extrapolated from the software was used as a metric for neuronal sparing. The cross-sectional area was then analyzed at the site of, rostral, and caudal to the injury. We determined the relationship between the spinal cord cross sectional area, muscle strength and therapy efficacy using regression analysis. **Results**: We found a 50.56% loss of white matter at the site of the injury, 42.83% rostral to the injury, and 36.51% caudal to the injury when compared to healthy controls. Regression analysis suggested that patients with more residual neurons post-injury recovered more muscle strength following two weeks of rehabilitation (R=0.742). **Conclusions:** Overall, our results suggest that spinal cord cross-sectional area may serve as an ideal biomarker to determine the recovery potential of any patient with an SCI.

ORMELOXIFENE NANOTHERAPY FOR CERVICAL CANCER TREATMENT

Neeraj Chauhan[1,2], Diane M. Maher[3], Bilal B. Hafeez[1,2], Hassan Mandil[2], Man M. Singh[4], Meena Jaggi[1,2], Murali M. Yallapu[1,2], Subhash C. Chauhan[1,2]

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Background: Cervical cancer (CxCa) ranks as the fourth most prevalent among women-related cancers worldwide. Therefore, there is a crucial need to develop newer treatment modalities. Ormeloxifene (ORM) is a non-steroidal, Selective Estrogen Receptor Modulator (SERM) that is used as an oral contraceptive in humans. Recent investigations suggest that ORM exhibits potent anticancer activity against various types of cancers. Nanoparticulates offer targeted delivery of anti-cancer drugs with minimal toxicity and promise newer approaches for cancer diagnosis and treatment. Therefore, the nanotherapy approach is superior compared to traditional chemotherapy, which is not site-specific and is often associated with various side effects. **Methods:** Pursuing this novel nanotherapy approach, our lab has recently developed ORM-loaded PLGA (poly [lactic-*co*-glycolic acid]), an FDA approved biodegradable polymer, formulated into nanoparticles to achieve targeted drug delivery and improved bioavailability. Our optimized PLGA-ORM nanoformulation showed improved internalization in both dose and energy dependent manners, through endocytosis-mediated pathways in both Caski and SiHa cell lines. Additionally, we employed MTS and colony forming assays to determine the short and long term effects of PLGA-ORM on these cells. **Results**: Our results showed that this formulation demonstrated improved inhibition of cellular proliferation and better clonogenic potential compared to free ORM. Furthermore, the PLGA-ORM nanoformulation exhibited superior anti-tumor activities in an orthotropic cervical cancer mouse model than did free ORM. **Conclusions:** Collectively, our findings suggest that our novel nanoformulation has great potential for repurposing the drug and becoming a novel modality for CxCa management.

FURTHER EVIDENCE SUPPORTING A POTENTIAL ROLE FOR ALCOHOL DEHYDROGENASE 1B (ADH1B) IN OBESITY

Morales LD[1], Kumar S[1], Curran JE[1], Göring HHH[1], Hu SL[2], Lopez-Alvarenga JC[1], Small K[3], Glastonbury C[3,4], Das SK[5], Langefeld C[6], Hanson R[7], Hsueh WC, Arya R[1], Mummidi S[1], Blangero J[1], Duggirala R[1], Jenkinson CP[1] , [1]Department of Human Genetics and South Texas Diabetes and Obesity Institute, School of Medicine, UTRGV, [2]School of Public Health, UT Health Houston, South Texas Veteran Health Care System

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Background: Insulin is an essential hormone that regulates metabolism. Insulin resistance arises when tissues fail to respond to insulin, and it leads to serious health problems like Type 2 diabetes. Obesity is an insulin resistant state. Two mechanisms contribute to obesity: (1) hyperplasia via adipogenesis and (2) hypertrophy via lipogenesis. We previously showed that *ADH1B* mRNA expression was inversely correlated with measures of obesity and insulin resistance in subcutaneous adipose tissue of Mexican Americans. **Methods:** Human subcutaneous primary adipocytes derived from non-obese (BMI < 28 $kg.m^{-2}$) or obese (BMI ≥ 30 $kg.m^{-2}$) donors were used to study the function of ADH1B in adipocytes. Changes in protein expression were analyzed by Western blot. ADH activity and adipocyte glucose uptake were measured by colorimetric assays. **Results**: A meta-analysis of four ethnic groups verified that *ADH1B* expression decreased as BMI increased. Adipocytes from non-obese donors expressed ADH1B protein at higher levels than obese donors in vitro. Moreover, ADH1B expression increased as preadipocytes differentiated into mature adipocytes. Insulin stimulated ADH1B expression in adipocytes, which yielded a concomitant increase in enzyme activity. Knockdown of ADH1B expression using siRNA resulted in a decrease of insulin-stimulated glucose uptake in dipocytes. **Conclusions:** Our results suggest that a deficiency in ADH1B gene/protein expression and activity is a characteristic of obesity. Moreover, the data imply that ADH1B is stimulated during adipogenesis and insulin signaling to play a role in these mechanisms, which are central to the progression of obesity. These findings indicate ADH1B may be a target for therapeutic intervention.

ERK1 AND ERK2 ARE REQUIRED FOR LIPOPOLYSACCHARIDE-INDUCED PRODUCTION OF CYTOKINES AND CHEMOKINES BY MACROPHAGES

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Background: Chronic inflammation may be due in part to changes in composition and function of gut microflora, which provide an intestinal barrier preventing bacterial lipopolysaccharide (LPS) release. Studies demonstrate that obesity increases gut permeability leading to elevated plasma LPS levels resulting in low-grade chronic inflammation and insulin resistance. We hypothesized that insulin resistance could be produced by inflammatory factors secreted by macrophages when exposed to gut-released LPS. We examined whether inhibition of the extracellular signal-regulated kinase (ERK) signaling pathway blocked LPS-mediated responses in bone marrow derived macrophages (BMDM). **Methods:** To determine which ERK isoform is involved in the regulation of inflammatory factor production, we used siRNA to knockdown ERK1, ERK2, or both. BMDM were treated with LPS (100 ng/ml, 6hr). Inflammatory factors were measured by ELISA. **Results:** LPS induced TNF-α, RANTES, MCP-1, and IFN-β production of 106371±18250 pg/ml, 11827 ± 1168 pg/ml, 851 ± 73 pg/ml, and 454 ± 46 pg/ml, respectively. Knockdown of ERK1 induced a 4.0-fold TNF-α and 2.0-fold RANTES decreased production. Knockdown of ERK2 induced a 9.2-fold TNF-α and 1.6-fold RANTES decreased production. Knockdown of either ERK isoform did not decrease MCP-1 and IFN-β release. However, double knockdown of ERK1 and ERK2 had the greatest inhibition of TNF-α, RANTES, MCP-1, and IFN-β production (not detected, 7.7-, 1.6-, and 14.6-fold decrease, respectively). **Conclusions:** Knockdown of both ERK isoforms is necessary to abrogate the LPS effect in macrophages. We propose that ERK positively regulates LPS-mediated inflammatory responses and inhibition of ERK signaling may protect against development of insulin resistance.

IMPACT OF ACCOUNTABLE CARE ORGANIZATIONS ON ACUTE CHOLECYSTITIS OUTCOMES IN THE RGV

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Background: Accountable care organizations (ACO) are a critical part of the Affordable Care Act designed

to improve the health of Medicare beneficiaries by providing high-quality care, and reducing costs, by preventing duplication of services in the primary care setting. The objective of this study was to compare results of patient care in patients admitted with acute cholecystitis between pre-ACO and post-ACO. **Methods:** A difference-in-differences analysis was conducted on a retrospective cohort to compare severity scales, postoperative complication rate, diagnostic imaging modality, and length of stay in patients with acute cholecystitis from a post-ACO implementation period (January 2014- December 2015) to a pre-ACO period (January 2011 - December 2012) in the Rio Grande Valley (RGV). **Results**: The study comprised of 400 patients with acute cholecystitis (198 pre-ACO and 202 post-ACO patients). As contrasted to the pre-ACO period, post-ACO patients had significant ($P<0.0001$) higher rates of disease severity (14.4% vs 8.4%), emergency admissions (90.1% vs 74.2%), CT scan use (55.5% vs 27.8), and prolonged length of stay (5.2 vs 3.9 days). **Conclusions:** This study corroborate that patients treated for acute cholecystitis in the ACO period were found to have an increase in disease morbidity, required more emergency admissions, needed more extensive management, with a prolonged length of stay, when compared with those in the pre ACO period. This study suggests that for patients admitted with acute cholecystitis, the implementation of ACOs shift the cost from primary care to the non-affiliated hospital, and provided patients with an overall lesser level of care.

A REVIEW OF THE DISABILITY ACCOMMODATIONS PRACTICES OF THE MEDICAL COLLEGE ADMISSIONS TEST

Thomas, M., Guerra Undergraduate Honors Thesis Program, UTRGV

Background: The proportion of American medical students with disabilities is drastically low compared to the general population. This study seeks to examine the compliance of the practices utilized by the Association of American Medical Colleges for reviewing requests for disability accommodations for the Medical College Admissions Test (MCAT) with established federal disability rights law. **Methods:** The MCAT's disability accommodations application process was examined across three categories of disability: learning disabilities, ADHD, and/or psychiatric disabilities, sensory disabilities, and physical disabilities. Within each category, the AAMC polices relating to required documentation, medical evaluation, and evaluation timeframe where compared to the ADA guidelines for accommodated testing. Each policy was rated as "compliant" or "non-compliant". **Results**: Of the nine policy areas examined, only five (56%) where compliant with federal disability rights law. **Conclusions:** The AAMC's disability accommodations policies for the MCAT exam do not meet federal standards and pose a significant potential burden and/or disadvantage for prospective medical students with disabilities. A key factor in closing healthcare disparities for minority groups is ensuring their adequate representation in the medical field. The AAMC should consider how its policies may negatively affect disability representation in the medical field, both for the sake of educational equity and as a necessary first step towards ending the persistent healthcare disparities faced by disabled patient populations.

ASSESSING THE IMPACT OF NON-RANDOM MATCHING IN SUPPORTING SUCCESSFUL TRANSITIONS TO MEDICAL SCHOOL: THE BIG SIB-LITTLE SIB PROGRAM

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Background: The transition into medical school can be stressful as students face changes in curricular structure and potential isolation from social support systems. Previous studies of the Big Sib-Little Sib peer-mentorship program found random matching presented limitations and potentially diminished the impact of the program. **Methods:** Two classes at UTRGV SOM were automatically enrolled into Big Sib-Little Sib upon matriculation. Fifty-five students from the Class of 2021 were randomly matched to 36 upperclassmen (16 1:1 pairs, 20 2:1 pairs) and 54 students from the Class of 2022 were matched with 39 upperclassmen (24 1:1 pairs, 15 2:1 pairs) based on desired characteristics such as sex,

race/ethnicity, marital status, specialty interest, or hobbies. A feedback questionnaire was administered at least 6 months following notification of mentorship matches. A mixed-methods approach was used to gauge program impact and future directions. Statistical analyses were conducted in R 3.5.3. **Results:** Thirty-one students (56.4%) from the Class of 2021 and 39 students (72.2%) from the Class of 2022 completed the survey. The program was found to be more effective in supporting the transition to medical school for students matched preferentially based on desired characteristics compared to random matching (87% vs 64%, p=0.012). Mentor approachability and monthly in-person communication were identified as additional factors that facilitate effective peer-mentorships. **Conclusions:** Matching incoming students to peer mentors based on desired characteristics strengthened the peer-mentorship connection and facilitated the transition into medical school. Future programs should focus on refining matching criteria and provide guidelines on effective strategies to mentors.

BARIATRIC SURGICAL SITE INFECTIONS: PATTERNS AND PREVENTION

Rebecca A. Uhlmann[1], MD, MS, Robert E. Alleyn[1], MD, Michael J. Martinez, MD[1], Ambrosio Hernandez, MD[1], R. Armour Forse, MD, PhD[1], Manish Singh, MD[1] , [1]Department of Surgery, University of Texas Rio Grande Valley and Doctors Hospital at Renaissance

Background: As a member of the MBSAQIP, our Center engages in an annual quality project. For 2017, the focus was on quantifying and understanding a noted increased incidence of surgical site infections (SSI). **Methods:** From January-June 2017, all bariatric surgeries performed at our institution by four surgeons were reviewed and patient and procedure data were collected. **Results:** 218 bariatric procedures were performed. Of those, 5 (2.29%) developed an SSI. Three were RYGB, one was a band converted to RYGB, and one was a band converted to gastric sleeve. Two surgeons had patients with SSI. Four (80%) SSI were at trocar sites (3 LUQ, 1 epigastric), one (20%) was a deep organ SSI and required readmission. Four (80%) patients were female, 3 (60%) were diabetics, and none were current tobacco users. SSI patients ranged in age from 29-63y (median 35y) and BMI ranged from 24-55 (median 35.3). All RYGB SSI cases used an EA stapler. Additionally, 3 (75%) of the RYGB SSI cases used a set of anorectal dilators to spread tissues prior to EA stapler insertion. Neither surgeon without SSI cases used the EA stapler or dilators. **Conclusions:** SSI are an unwelcome complication in any surgical specialty. As part of a QI study to account for an uptick in SSI in our bariatric procedures, we have discovered a potential source for infection; namely, tracts at trocar sites created by anorectal dilators and EA staplers. Additional study of surgical techniques, patient characteristics, and SSI is underway.

EPIDEMIOLOGY OF PEDIATRIC FIREARM INJURIES: HAVE WE IMPROVED IN THE PAST DECADE?

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Introduction: Firearm fatalities in the pediatric population continue to be at the center of a national crisis surrounding gun violence. We aim to explore a 10-year analysis of pediatric firearm injury epidemiology. **Methods:** A 10-year review (2007-2016) of the National Trauma Data Bank (NTDB) was conducted to identify pediatric injuries as a result of firearms. Pearson Chi Square tests were conducted to identify differences in temporal trends across various intents of injury. **Results:** 36,763 pediatric firearm-related injuries were identified in the NTDB. Blacks accounted for 39% of injuries whereas Hispanics and Whites accounted for 17% and 16%, respectively. Most pediatric firearm injuries were resultants of assault (n=24,388, 66%) while 23% were unintentional (n=8,629), and 5% were self-inflicted (n=1,830) ($p<0.05$). Roughly 1 in 4 pediatric patients were taken directly to the operating room whereas 1 in 6 were admitted directly to the ICU. 4% of patients died in the emergency department. Between 2007 and 2015, there was an 18% decline in assault-related firearm injuries. However, there was a 52% increase in unintentional firearm injuries during this same time period. Interestingly, 2016 saw a shift in these trends with a 7% increase and 22% decrease in assault and unintentional injuries, respectively. **Conclusion:** Inclusive gun control policies and a focus on primary prevention

seem to play a role in the steady decline of assault-related injuries. The recent shift in assaults highlights the need for a unified probe into this national crisis to safeguard current and future generations of this vulnerable population.

INTEGRATED BEHAVIORAL HEALTH MODELS ARE EFFECTIVE IN IMPROVING HEALTH OUTCOMES FOR LOW-INCOME, HISPANIC POPULATIONS IN MEDICALLY UNDERSERVED AREAS IN THE BORDER REGIONS OF SOUTHERN TEXAS

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Background: Integrated behavioral health (IBH) models have been demonstrated to improve mental and physical health outcomes, but few of those models have been tested in a low-income, Hispanic population. This study evaluates the effectiveness of IBH programs in a Texas border region. **Methods:** Eight subgrantees in southern Texas implemented different IBH models in various settings (e.g., community clinic, mental health authority) and conducted rigorous evaluation studies (e.g., RCT, QED) (total n=4,226). After 12 months, multivariate analyses comparing those receiving IBH care to those receiving usual care were conducted on five common outcome measures: depressive symptoms (PHQ-9), blood pressure, HbA1c, BMI, and quality of life (Duke Quality of Life scale). We conducted a pooled regression analyses with individual level data. **Results**: On average at 12 months, intervention participants receiving IBH had significantly lower HbA1c than those receiving standard care, controlling for age, sex, baseline characteristics, and contextual factors (β=-0.14, p=0.02). Intervention participants receiving IBH, on average, had a significantly lower PHQ-9 score at 12 months than those receiving standard care, controlling for age, sex, baseline characteristics, and contextual factors (β=-0.39, p=0.03). For certain subgroups, intervention participants showed significant improvements in HbA1c at 12 months compared to comparison participants, particularly among diabetics and those with depression at baseline. **Conclusions:** IBH models can be adapted to improve physical and mental health outcomes in a low-income, Hispanic population. These findings may be used to develop effective IBH approaches in this population and have policy implications on workforce development, service delivery mechanisms, and clinical-community partnerships.

ETHNIC DISPARITIES IN MENTAL HEALTH STATUS: FOCUS ON SELF-REPORTED DEPRESSIVE SYMPTOMS IN OLDER, HISPANIC/LATINO ADULTS

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Background: Individuals with age-related diseases and their caregivers experience psychological distress that makes them vulnerable to depression. Furthermore, underrepresentation of minorities in clinical research hinders our knowledge of these multiplex groups. Our goal is to increase our understanding of older Hispanic Americans with emphasis on psychological functioning and psychosocial risk factors. **Methods:** The Health and Retirement Study is a longitudinal study with a nationally representative sample of older adults. Using data from the 2010 survey, we identified a subsample of Hispanic American participants to determine how many individuals were included and what percentage reported negative affective symptoms. We completed descriptive statistics and chi-squared tests to assess the association between being Hispanic and depressive symptoms. **Results:** Our analysis indicates that out of the 22,034 participants, only 1,480 reported being Hispanic or Latino. Our findings reveal statistically significant differences in the reporting of depressive symptoms between Hispanics and non-Hispanics. Hispanic participants reported higher rates of feeling depressed,

χ^2

(1, N=6,502)= 62.53, $p < 0.001$, feeling sad,

χ^2

(1, N=6,502) = 54.09, p < 0.001, feeling lonely, (1, N=6,502)= 28.09 p < 0.001, feeling unmotivated, (1, N=6,502)= 14.10, p < 0.001, restless sleep, (1, N=6,502)= 6.96, p = 0.008, and feeling everything was an effort, (1, N=6,502)= 7.37, p = 0.007.

Conclusions: This preliminary study will guide future analyses that focus on the mental health of Hispanic American caregivers. Such information will aid in the identification of the underlying risk factors and facilitate development of effective and inclusive interventions that assist the caregiver-care recipient dyad.

CAROTENOIDS ARE INVERSELY ASSOCIATED WITH THE RISK OF BLADDER CANCER A DOSE-RESPONSE META-ANALYSIS

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Background: Some evidence indicates that carotenoids may reduce the risk of bladder cancer (BC), but the association has been unclear. We conducted a systematic review and meta-analysis of case-control and cohort studies investigating the relationship between carotenoid intake or blood levels of carotenoids and BC risk. **Methods:** Relevant epidemiologic studies were identified by a search of PUBMED and SCOPE databases, and the Cochrane Library from inception to April 2019 with no restrictions. A fixed or random-effects model was used based on the heterogeneity test to calculate pooled RRs and their 95% confidence intervals (CIs) across studies for high vs low categories of intake or blood levels. We also performed a dose-response meta-analysis. **Results:** A total of 22 studies (n=516 740) were included in the meta-analysis. The pooled RRs of BC for the highest vs lowest category of carotenoid intake and blood carotenoid levels were 0.88 (95% CI, 0.76-1.03) and 0.36 (0.12-1.07), respectively. The pooled RRs of BC for the highest vs lowest blood lutein & zeaxanthin levels was 0.58 (0.42-0.82). Dose-response analysis showed that BC risk decreased by 2% for every 1 mg increase in daily dietary total carotenoid intake (RR=0.98; 95% CI, 0.97-0.99); by 42% for every 1 mg increase in daily dietary β-cryptoxanthin intake (0.58; 0.36-0.94); by 76% for every 1 µmol/L increase in blood levels of α-carotene (0.24; 0.08-0.67); by 27% for every 1 µmol/L increase in blood levels of β-carotene (0.73; 0.57-0.94); and by 56% for every 1 µmol/L increase in blood levels of lutein & zeaxanthin (0.44; 0.28-0.67). **Conclusions:** Dietary carotenoid intake, especially β-cryptoxanthin intake and blood levels of α-carotene, β-carotene, and lutein & zeaxanthin, were inversely associated with BC risk.

TRANSCRIPTOMIC AND FUNCTIONAL PROFILES OF IPSC GENERATED CARDIOMYOCYTES

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Background: The metabolic syndrome associated chronic cardiac dysfunction is a risk factor for clinical heart failure. Hispanics/Latinos are disproportionately affected by metabolic syndrome, and therefore are at a higher risk of developing cardiac dysfunction. The cardiomyocytes (CMs), which can be differentiated from patient derived induced pluripotent stem cells (iPSCs), holds high promise to provide a more predictive and clinically relevant tool for *in-vitro* disease modelling to better understand the molecular basis of cardiac dysfunction and facilitate the development of

better therapeutics. **Methods:** Using our highly efficient iPSC reprogramming workflow and cryopreserved lymphoblastoid cell lines established from 17 Mexican American participants of our San Antonio Family Heart Study, functional beating CMs were generated. To better understand the functional characteristics and disease modeling potential of the generated CMs, genome-wide RNA sequencing was performed. **Results:** Differential gene expression analysis identified 4,237 genes that were significantly differentially expressed (moderated *t* statistics *p*-value ≤0.05, fold-change absolute ≥2.0) between iPSCs and differentiated CMs. The 2,127 genes that were significantly upregulated in CMs showed significantly high enrichment in cardiovascular system development and function (548 genes; *p*-value $3.41x10^{-13}$ to $1.59x10^{-72}$). The other disease and cardiac conditions enriched were cardiovascular diseases (579 genes; *p*-value $5.58x10^{-13}$ to $1.46x10^{-69}$), cardiac enlargement (195 genes; *p*-value $3.13x10^{-1}$ to $1.09x10^{-44}$), cardiac dilation (104 genes; *p*-value $3.13x10^{-1}$ to $1.52x10^{-28}$), cardiac arrythmia (94 genes; *p*-value $3.74x10^{-1}$ to $1.22x10^{-27}$), and cardiac dysfunction (82 genes; *p*-value $5.27x10^{-1}$ to $1.01x10^{-23}$). **Conclusions:** These results strongly support the potential utility of iPSC generated CMs in modeling cardiomyopathies and cardiac dysfunction.

ANALYSIS OF POTENTIAL BIOMARKERS FOR PREDICTING SUICIDAL BEHAVIOR.

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Background: It's estimated that about 43% of the variability in suicidal behavior could be explained by genetics. Alterations in the expression of several genes have been associated with suicidal behavior, including Interleukin 1B (*IL-1B*) and the ATP binding cassette transporter 1 (*ABCA1*). Proinflammatory cytokines, such as *IL-1B*, play an important role in the physiopathology of depression and it has been seen that high levels of *IL-1B* are associated with mood disorder spectrum. On the other hand, *ABCA1* is responsible for the major part of the cholesterol homeostasis through efflux, and it's suggested that the release of cholesterol may be key to the association between free cholesterol and suicide attempt. This study investigated the association between genetic variants rs16944 (*IL-1B*) and rs4149268 (*ABCA1*) in suicide completers and non-suicidal individuals to determine their probable association with suicide. **Methods:** We evaluated 153 unrelated suicide completers and compared them to 124 non-suicidal individuals. Genotypes were analyzed using the Real Time-polymerase chain reaction method and two allele-specific probes to detect specific SNP targets. **Results**: SNP rs16944 (*IL-1B*) showed no difference in genotype frequency between groups. On the other hand, rs4149268 (*ABCA1*) (odds ratio=2; 95% CI 1.18-3.37) had with the highest frequency (56.1%) the homozygote genotype T/T (variant allele) in cases, while the most frequent genotype in controls was the heterozygote with 45.4% (p=0.03). When rs4149268 was analyzed only in men, OR= 2.61 (95% CI 1.28-5.34).
Conclusions: The present study suggests that variant T allele of rs16944 increases the risk of committing suicide, especially in men.

THERAPEUTIC EFFICACY OF BROMO-ORMELOXIFENE IN CERVICAL CANCER: AN *IN VITRO* AND *IN VIVO* STUDY

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Background: Cervical cancer (CxCa) is one of the most common cancers among women worldwide and associated with poor 5-year survival rates. Current chemotherapeutic agents for CxCa have shown systemic toxicity in cervical cancer patients. Ormeloxifene (ORM) is an oral contraceptive and exhibited potential inhibitory effects in several different cancers. Here, we have designed and characterized a novel analogue of ormeloxifene, bromo-ormeloxifene (Br-ORM), and assessed its therapeutic efficacy against CxCa *in vitro* and *in vivo* model systems. **Methodology:** The effect of Br-ORM on CxCa cells (CaSki and SiHa) proliferation and growth was determined by MTS and colony formation assays. Effect of Br-ORM on the expression of epithelial-to mesenchymal (EMT) markers, MMPs and miR-200a was analyzed by Western blot and qPCR analyses respectively. The anti-tumor efficacy of Br-ORM was investigated in orthotopic xenograft mouse model of CxCa. **Results:** Br-ORM treatment inhibited cell proliferation, clonogenic potential and induced apoptosis. Br-ORM treatment arrests cell cycle progression in G1-S phase in CxCa. In functional assays, Br-ORM reduced migratory, and invasive potential of cervical cancer cells *via* modulations of MMPs. Br-ORM markedly reduced the EMT process as evident by suppression of N-cadherin, Vimentin, Snail and β-catenin expression. Br-ORM potently reduced the translocation of β-catenin in the nucleus. Moreover, molecular docking analysis revealed that Br-ORM proficiently binds into active site of β-catenin Br-ORM treatment significantly ($P<0.01$) regressed the cervical tumor growth in orthotropic xenograft mouse model. **Conclusion:** Br-ORM could be used as a novel therapeutic modality for the treatment of CxCa.

SUSCEPTIBILITY TO STRESSORS IN THE GRAY SHORT-TAILED OPOSSUM (*MONODELPHIS DOMESTICA)*

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Background: Humans and non-human animals experience a wide range of environmental stressors. The relationship between stressful experiences and changes in phenotypic behavior is a growing topic of interest. Our lab investigates psychological and psychosocial stressors in the laboratory opossum (*Monodelphis Domestica*).
Methods: We assessed changes in behaviors when stress was experienced. A group of animals was exposed to social isolation (psychosocial) stress and then tested in a social interaction task. Another group was exposed to handling (psychological) stress and tested in an open field. Subjects were tested in both stressful and low-stress conditions. We recorded behaviors using a camera and AnyMaze motion-detecting Software. The recorded behaviors were scored using Jwatcher software and data were analyzed with SPSS using a paired sample t-Test.
Results: Statistically significant changes in multiple behaviors occurred when comparing the high-stress to the low-stress conditions in 22 socially-isolated adult animals. Low-stress lead to decreases in social duration ($t_{(21)}= 4.673$, $p<.0001$), defensive duration ($t_{(21)}=2.16$, $p<.05$), and aggression ($t_{(21)}=3.638$, $p<.005$). Overall, animals were less aggressive in the low-stress condition. Although the sample size was low (n=4) in the open field test, our data suggests a reactivity to handling, as evidenced by an increase in freezing behavior due to stress ($t_{(3)}=-2.455$, $p<.091$). **Conclusions:** This study will provide valuable information of a lab animals' susceptibility to different forms of stress. Understanding how stress can affect behavioral changes in a general population will guide future investigations to identify certain phenotypes within a population and underlying neural mechanisms guiding these behaviors.

NOVEL NANOPARTICLE FORMULATION OF VERU 111 FOR PANCREATIC CANCER THERAPY

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Background: Pancreatic cancer (PanCa) is one of the leading causes of cancer-related mortality in the United States due to very limited therapeutic options. Thus, developing novel therapeutic strategies will help for the management of this disease. We recently identified VERU-111, a novel synthetic molecule which showed potent anti-cancer effect against PanCa *via* targeting clinically important βIII and βIV tubulin isoforms. In this study, we synthesized and characterized its novel nanoformulations (MNP-VERU) and evaluated its therapeutic effects *in vitro* and xenograft mouse model.
Methods: MNPs were prepared by chemical precipitation method and loaded with VERU-111 using diffusion method. This formulation was characterized for particle size, chemical composition, and drug loading efficiency, using various physico-chemical methods (TEM, FT-IR, DSC, TGA, and HPLC). The internalization of MNP-VERU was achieved after 6 hours incubation with MNP-VERU in PanCa cells. To determine therapeutic efficacy of MNP-VERU, we performed various *in vitro* (MTS, wound healing, Boyden chamber real-time xCELLigence, and apoptosis assays) and *in vivo* (mouse tumor xenograft) studies using PanCa. Effect of MNP-VERU on various key oncogenic signaling pathways, and miRNAs was evaluated by Western blot, immunohistochemistry (IHC), confocal microscopy, qRT-PCR and *in situ hybridization* (ISH) analyses respectively. **Result:** Our novel MNP-VERU formulation provided average size of 110 nm in dynamic light scattering (DLS) and exhibited -8.23 to -11.65 mV zeta potential with an outstanding loading efficiency (94%). Cellular uptake and internalization studies demonstrate that MNP-VERU escape lysosomal degradation, providing efficient endosomal release to cytosol. MNP-VERU showed remarkable anti-cancer potential in various PanCa cells (Panc-1, AsPC-1, HPAF-II, BxPC-3, MiaPaca) and more effectively repressed βIII and βIV tubulin isoforms *via* restoring the expression of miR-200c. MNP-VERU more effectively suppressed AsPC-1 cells derived xenograft tumors in athymic nude mice. **Conclusions:** Taken together, our results suggest that MNP-VERU has more anti-cancer potential than free VERU-111 against PanCa. MNP-VERU may reduce the toxicity and improve the bioavailability of free VERU-111 and could be used for the management of PanCa.

POSTER PRESENTATION ABSTRACTS

Faculty, Staff and Other Category

THE SEARCH FOR NOVEL ENDOPHENOTYPES PREDICTING GENETIC RISK OF DEMENTIA IN MEXICAN AMERICANS

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Background: Dementia is an age-associated neurodegenerative disease marked by a diminishing cognitive function. Alzheimer's disease being the most common type of dementia. ADRDs affect individuals of all ethnicities, but Hispanic individuals show a 1.5-fold higher ADRD's risk when compared to non-Hispanic whites. ADRDs are complex phenotypes and the identification of ADRD's biomarkers is a key research topic in recent years. **Methods**: For such, we propose to identify novel non-invasive endophenotypes (a particular type of biomarker that specifically indexes genetic risk) using high dimensional multiomic data in an existing cohort of Mexican American individuals. A set of 70 GOBS' subjects were diagnosed as suffering from dementia and is a heritable trait (h^2= 0.75) supporting a major genetic component. The ADRD cases have 363 1st, 2nd, 3rd, and 4th degree relatives and will be contrasted to a set of 839 individuals with no ADRD case in the family. **Results**: Our proposal was tested using a set of 113 genes associated to Alzheimer's disease. We observed a clear enrichment for significant effects ($p=3.3\times10^{-10}$). Several cytokine genes (*TNF, IL1B, and IL1A*) exhibit reduced expression in relatives of ADRD cases versus controls. Notably, the *APBB1* gene showed increased expression in cases, this gene has a key function for the amyloid precursor protein's regulation that is central for ADRD's development. **Conclusions**: The efficient selection of relevant transcriptomic endophenotypes can aid the identification genes involved in ADRD risk. Quantitative non-invasive endophenotype identification may ultimately aid early detection of increased ADRD and improve healthcare of ADRD patients.

RNA BINDING PROTEIN HUR REGULATES CCL2 ALLELIC EXPRESSION IMBALANCE

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Background: CC-chemokine ligand 2 (CCL2) is involved in the pathogenesis of several diseases that are associated with monocyte/macrophage recruitment such as atherosclerosis, HIV-associated Neurocognitive Disorder (HAND), and tuberculosis. Genetic variation in CCL2 is associated with increased CCL2 expression and leukocyte recruitment. The rs1024611G-rs13900T haplotype is associated with increased CCL2 expression and deleterious disease outcomes. However, the mechanisms underlying these differences are poorly understood. **Methods:** Bioinformatic approaches were used to assess the impact of rs13900 on HuR binding and on mRNA secondary structure. HuR binding to rs13900C/T in vitro and ex vivo was determined by RNA electrophoretic mobility shift assays and RNA immunoprecipitation assays. Effect of C to T transition on mRNA stability was determined by reporter assay constructs. Finally, the effect of overexpression and silencing of HuR on CCL2 expression in monocytes/macrophages was

assessed. **Results:** Bioinformatic analysis showed that rs13900 altered a predicted HuR binding site in CCL2 3'-UTR and its secondary structure. Supporting this prediction, the rs13900 T allele bound with a higher affinity to HuR both *in vitro* and *ex-vivo*. Furthermore, rs13900 T conferred greater stability to CCL2 transcript in transcriptional inhibition studies. A reporter construct bearing rs13900T showed increased luciferase activity relative to 13900C construct. Finally, a direct role for HuR in mediating this increased stability is demonstrated in overexpression and silencing studies. **Conclusions:** We showed that HuR modulates CCL2 expression by differential interactions with a 3'UTR SNP by altering its stability. Our studies provide a functional basis for interindividual differences in CCL2-mediated disease susceptibility.

REPETITIVE DNA – A CLASSICAL CAUSE OF DISEASE REINVIGORATED BY APPLICATION OF NEW DETECTION TOOLS IN WHOLE GENOME SEQUENCE DATA.

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Background: Short-tandem repeats (STRs) are DNA variations of clinical importance to neurological disorders. New bioinformatic methods that can measure STRs in existing whole genome sequence (WGS) data have been developed in recent years. The potential for these tools to assess clinically relevant STRs has not been explored in large families, nor extensively in Mexican Americans. **Methods:** We applied two current methods of STR measurement, ExpansionHunter and exSTRa, to 2097 genomes from the San Antonio Family Study (SAFS). SAFS is a randomly ascertained, longitudinal pedigree based cohort of Mexican Americans. Individuals in SAFS have been evaluated multiple times since the study conception in the 1990s, including comprehensive neuroimaging and neurocognitive assessments for 1445 participants. We focused our attention in this work on profiling 21 clinically relevant STRs. We examined their inheritance within families, and are assessing their effects on relevant neurological measures in carriers. **Results**: We identified 12 STR expansions at the SCA8 locus in 9 families and 29 carriers of the SCA10 expansion in 10 families. At pathogenic lengths these STRs cause the development of autosomal dominant spinocerebellar ataxia 8 and 10, respectively. While SAFS does specifically record ataxias, this disease may be undiagnosed in this clinically underserved minority group. We hypothesized that, in the absence of overt ataxia, we will detect associations with ataxia relevant measures in carriers. **Conclusions:** STRs are an important form of clinical genetic variation. Here we show inheritance of clinically relevant STRs in Mexican American families and ongoing work will characterize whether these STRs associate with disease related measures.

ORMELOXIFENE NANOTHERAPY FOR CERVICAL CANCER TREATMENT

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Background: Cervical cancer (CxCa) ranks as the fourth most prevalent among women-related cancers worldwide. Therefore, there is a crucial need to develop newer treatment modalities. Ormeloxifene (ORM) is a non-steroidal, Selective Estrogen Receptor Modulator (SERM) that is used as an oral contraceptive in humans. Recent investigations suggest that ORM exhibits potent anticancer activity against various types of cancers. Nanoparticulates offer targeted delivery of anti-cancer drugs with minimal toxicity and promise newer approaches for cancer diagnosis and treatment. Therefore, the nanotherapy approach is superior compared to traditional chemotherapy, which is not site-specific and is often associated with various side effects. **Methods:** Pursuing this novel nanotherapy approach, our lab has recently developed ORM-loaded PLGA (poly [lactic-*co*-glycolic acid]), an FDA approved biodegradable polymer, formulated into nanoparticles to achieve targeted drug delivery and improved bioavailability. Our optimized PLGA-ORM nanoformulation showed improved internalization in both dose and energy dependent manners, through endocytosis-mediated pathways in both Caski and SiHa cell lines. Additionally, we employed MTS and colony forming assays to determine the short and long term effects of PLGA-ORM on these cells. **Results**: Our results showed that this formulation demonstrated improved inhibition of cellular proliferation and better clonogenic potential compared to free ORM. Furthermore, the PLGA-ORM nanoformulation exhibited superior anti-tumor activities in an orthotropic cervical cancer mouse model than did free ORM. **Conclusions:** Collectively, our findings suggest that our novel nanoformulation has great potential for repurposing the drug and becoming a novel modality for CxCa management.

UNTARGETED LIPIDOMIC PROFILES AS ENDOPHENOTYPES FOR CVD RISK

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Background: Cardiovascular disease (CVD) is the leading cause of mortality worldwide. Risk is attributable to several factors including blood pressure, smoking, age, and genetics. Although CVD risk is heritable, the genetic basis remains relatively unknown. Measurable traits related to disease can offer more power for identifying disease genes than disease status itself and thus serve as valuable disease endophenotypes. Lipids are important factors for CVD risk and represent endophenotypes that may influence CVD risk. Methods: We performed untargeted plasma lipidomic profiling in 500 individuals from 6 extended pedigrees of the San Antonio Family Study. Untargeted lipidomic profiling was performed by liquid chromatography mass spectrometry. MS analysis was used to measure features, and characterization occurred through existing targeted lipidomic platform and mass spectral acquisitions. Results: A total of 135,414 raw features were identified. To identify genetic factors influencing lipid levels, we performed heritability analyses. Approximately 50% (72,184) of lipid features were significantly heritable, with heritabilities of 20-80%. We examined whether variation in these heritable features was associated with future CVD. The 10 most significantly associated features ($P=7.95\times10^{-6}$ to $P=4.04\times10^{-5}$) include lipid species in 5 classes with changes of ~0.7 SDUs observed in individuals who develop CVD. The heritability of these features was >40% indicating a significant genetic component to variation. Conclusions: These preliminary results provide strong evidence that using an untargeted approach will identify many more lipid species associated with CVD than targeted only profiling methods thus providing a powerful approach for identification of endophenotypes influencing CVD risk.

KERNELS OF THE ADAPTIVE IMMUNE, INNATE IMMUNE, AND HEMOSTASIS SYSTEMS IN RELATION TO THE METABOLIC SYNDROME (MS)

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Background: The metabolic syndrome (MS) is a potent risk factor for type 2 diabetes and cardiovascular disease. Surely, its determination process must involve a systems biology perspective. We describe how the adaptive-immune (A_I), innate-immune (I_I), and hemostasis (H) systems can be incorporated in models of the determination of MS traits, namely fasting insulin (FI) and glucose (FG), systolic and diastolic blood pressure (SBP and DBP), triglycerides (Trig), high-density-lipoprotein-cholesterol (HDL), and waist-circumference (WC) (1185 to 1205 individuals depending on the trait). **Methods:** We had gene expression data for 456, 595, and 328 genes in the A_I, I_I, and H systems. Each system can be converted into a Mahalanobis distance kernel, which is transformed to a similarity kernel, and can be incorporated in standard statistical genetic kernel models. Further, we can model two (at a time) or all three systems, and if dictated by the results, even the interaction of systems. Multiple hypothesis testing was controlled using the false discovery rate (FDR). **Results**: A_I was not important for any trait. H alone was significant for SBP and DBP ($p<0.01$), I_I alone was significant for Trig ($p=0.012$), and both H and I_I were significant for FI ($p<0.01$) and WC ($p<0.001$). Interestingly, for WC, there was significant interaction between the H and I_I systems ($p=0.039$), which is the only test in its class (FDR-control not needed). **Conclusions:** This modeling approach holds much promise for incorporating systems biology in the modeling of complex disease traits. Also, this is the first report of true systems-level interaction.

THE ROLE OF EXOSOMES-ASSOCIATED MICRORNAS IN PROSTATE CANCER DISPARITY AND THEIR ASSOCIATION WITH TUMOR AGGRESSIVENESS

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Background: Prostate cancer (PCa) is the second leading cause of death among elder men. The morbidity and mortality rates of PCa in African American (AA) are twice higher than in European American (EuA) men. The molecular mechanisms underlying the tumor aggressiveness in AA men have not been fully investigated. Thus, we aimed to evaluate the diagnostic utility of exosomal microRNAs (miRs) at advanced stages of PCa. **Methods:** Exosomes were isolated from the conditioned media of AA and EuA PCa cell lines. The expression of miRs was validated in exosomes isolated from blood of forty AA and EuA patients using qPCR analysis. Their sensitivity and specificity were assessed using receiver operating characteristic (ROC) curve analysis. To study the functional significance of exosomal miRs, cell proliferation, clonogenic, and migration assays were performed. **Results:** Differential expression of exosomal miR-3613-3p, miR-3218, miR-3679, and miR-3680 was demonstrated in the blood of AA versus EuA of PCa patients. The accuracy of miR-3679 (AUC = 0.717) to discriminate AA from EuA was improved (AUC = 0.897) when combined with the other three miRs. Intriguingly, miR-3128 showed a dual role in AA versus EuA cells. Overexpression of miR-3128 increased the cell growth in AA cells while suppressed it in EuA cells. **Conclusions:** Our findings underscore the role of exosomal miRs in health disparity of PCa. The differential expression of miRs in AA men demonstrates their reliability as biomarkers and their potential role in promoting tumor aggressiveness in AA men.

PRODUCTION OF A RECOMBINANT AVIAN INFLUENZA HEMAGGLUTININ IN *E. COLI*

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Background: Poultry protein is the most accessible protein source for Mexicans. Unfortunately, Influenza A virus (IAV) is responsible for the death of millions of form birds throughout the world, leading to an increase in price and, thus deficient nutrition. Furthermore, IAV can cause human morbidity and mortality in enzootic regions. Therefore, it is important to control IAV to maintain good food systems and to avoid aggravating health disparities. Our objective was to design a production process for a recombinant hemagglutinin subunit (HA) of influenza A/H5N1 as a potential key ingredient of a biotech new avian vaccine, using a prokaryotic biotechnological platform. **Methods:** A synthetic construction of HA was optimized for expression and transformed in *Escherichia coli*. Expression of rHA was screened by SDS-PAGE electrophoresis. Subsequently, production was carried out at a laboratory scale in a 1L-bioreactor. Then, the protein was semi-purified by differential centrifugation, washes, and solubilization of the inclusion bodies. Finally, immunoreactivity was analyzed by ELISA. **Results**: Recombinant HA in *E. coli* yield was 1.2 mg in 1 mL at test tube level, while in 1L bioreactor the maximum yield was 1.4 mg/mL. This protein was obtained at 90% purify and it showed detectable immunoreactivity. **Conclusions:** This system is potentially faster, cheaper, and environmentally more friendly than current means of vaccine production. By applying this approach, we could prevent this other type of health disparity caused by uncontrolled IAV pandemics.

APEX1 INDUCES CERVICAL CANCER PROGRESSION THROUGH INTEGRIN-FAK SIGNALING

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Background: Human AP endonuclease 1 (APEX1) is involved in a multifunctional mechanism including DNA repair and redox signaling which interacts with transcriptional factors induce cancer progression. Our previous studies demonstrated that APEX promoted colorectal and pancreatic cancer progression. Interestingly, recent studies have reported genetic variations of APEX1 were found in Asian, Indian, and European cervical cancer. However, molecular mechanism of APEX1 is not still clear in cervical cancer. **Methods & Results:** We analyzed APEX1-overexpressing and -downregulated GM00637A through DNA microarray, Affymetrix, USA. In this study, we found that cell adhesion molecules were significantly upregulated by APEX1. FACS and Western blot analysis showed APEX1 induces the expression and activation of adhesion molecules including integrin signaling and FAK signaling in APEX1-overexpressing GM00637 cells. To evaluate whether APEX1-mediated regulation of integrin-FAK signaling is involved in cell migration in cervical cancer cells, a migration assay was performed using APEX1-specific siRNA and an integrin Alpha V-specific antibody. Cell migration was significantly decreased in the APEX1-downregulated cervical cancer cells, which was comparable with inhibition of integrin Alpha V. Consistent with these results, APEX1 increased the activation and expression of integrin Alpha V and FAK in both cervical cancer cells and cervical cancer patient tissue. Taken together, these studies suggest that APEX1 can promote cell adhesion and migration through integrinV-FAK signaling and thereby this signaling mechanism contribute to cervical cancer progression. **Conclusions:** In this study, we are the first to report that APEX1 activates cell adhesion-related proteins to trigger cell migration of cervical cancer cells.

SOFTWARE FOR PEAK ALIGNMENT AND QUANTIFICATION OF COMPREHENSIVE TWO-DIMENSIONAL GAS CHROMATOGRAPHY TIME-OF-FLIGHT MASS SPECTROMETRY METABOLOMICS DATA

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Background: Comprehensive two-dimensional gas chromatography time-of-flight mass spectrometry (GC×GC-TOFMS) is a sophisticated and sensitive approach to characterizing the metabolic state of tissues and bodily fluids. Here we present new software for processing and aligning peaks from large GC×GC-TOFMS datasets from the LECO Pegasus 4D instrument. **Methods:** The pipeline: (1) calculates adjusted retention times based on spiked-in internal standards for all deconvoluted peaks; (2) compares mass spectra between proximate peaks via pairwise correlation analysis; and (3) aligns peaks within and across samples at a chosen correlation coefficient threshold, outputting total ion counts, among other statistics. To evaluate the software, we conducted 75 runs (3 vials, 25 runs each) of EPA Method 8270 standards and processed the resulting metabolomics data from ChromaTOF. **Results:** After alignment (spectral r>0.9), 268 peaks were identified, of which 66 were observed in more than 95% of runs, detecting 67 (88%) of the 8270 compounds. After standardization and log transformation, the robust peaks showed an average coefficient of variation of 4%, with increased variability observed at low retention times. Pairwise correlations yielded high r values between runs (0.72 to 0.999). REML modeling attributed most of the total variation to variation between aligned peaks (93%), with non-significant amounts attributed to differences between runs and vial source (both <1%). **Conclusions:** Our software appears well-suited for processing GCxGC metabolomics data, exhibiting limited variation in aligned peak areas of known compounds. The software is now being applied to metabolomics data generated on blood plasma samples for identifying diabetes and obesity biomarkers.

HUMAN IPSC-DERIVED HEPATOCYTES REVEAL THE FUNCTIONAL CONSEQUENCES OF AN HISPANIC RARE SEQUENCE VARIANT IN THE DEGS1 GENE

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Background: Levels of individual dihydroceramide and ceramide species, and ratios between species, have been implicated in metabolic and cardiovascular diseases. In the final step of the *de novo* ceramide synthesis pathway, conversion of dihydroceramide into ceramide is catalyzed by delta-4-desaturase DEGS1. In whole genome sequences of 1,020 participants of our San Antonio Mexican American Family Study, we have identified an Hispanic-ancestry-specific variant (L175Q) in the *DEGS1* gene, which significantly reduce DEGS1 enzymatic activity. **Methods:** To study the effect of this variant on liver metabolism, cryopreserved lymphoblastoid cell lines established from four L175Q carriers (heterozygotes) and five of their wild-type blood relatives were reprogrammed into iPSCs and then differentiated into mature hepatocytes. The generated iPSCs and hepatocytes were genome-wide RNA sequenced. **Results:** The expressed hepatic transcriptome (3879 significantly upregulated genes; moderated t-statistics FDR p-value ≤0.05, Fold-Change ≥2.0) was identified by differential gene expression analysis of iPSCs and their hepatocyte transcriptome. A fold-change analysis of the expressed hepatic transcriptome between L175Q carriers and their wild-type blood relatives identified 57 differentially expressed (DE) genes (Fold-Change absolute ≥2.0). The DE genes were significantly enriched in hepatic fibrosis/hepatic stellate cell activation canonical pathways (p-value =8.28×10^{-5}) and in lipid metabolism (13 genes; p-value 9.56×10^{-3} to 5.64×10^{-6}). The conversion and concentration of lipid were predicted to be modestly activated whereas efflux of cholesterol was predicted to be modestly deactivated in the carriers. **Conclusions:** These results suggest that the rare *DEGS1* variant we identified, and the associated ceramide synthesis pathway may influence hepatic lipid metabolism and liver fibrosis.

CO-PHOSPHORYLATION NETWORKS REVEAL SUBTYPE-SPECIFIC SIGNALING MODULES IN CANCER

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Background: Protein phosphorylation is a ubiquitous mechanism of post-translational modification that plays a central role in cellular signaling. Phosphorylation is particularly important in the context of cancer, as down-regulation of tumor suppressors and up-regulation of oncogenes (often kinases themselves) by dysregulation of the associated kinase and phosphatase networks are shown to have key roles in tumor growth and progression. Despite recent advances that enable large-scale monitoring of protein phosphorylation, these data are not fully incorporated into such computational tasks as phenotyping and subtyping of cancers. Methods: We develop a network-based algorithm, CoPPNet, to enable unsupervised subtyping of cancers using phosphorylation data. For this purpose, we integrate prior knowledge on kinase-substrate associations and protein-protein interactions with the co-phosphorylation of phosphosites across different tumor samples to construct a dynamically weighted network of phosphosites. We then mine these networks to identify sub-networks with coherent phosphorylation patterns. Results: We apply the proposed framework to two phosphorylation datasets for breast cancer, and observe that (i) the identified subnetworks induce phosphorylation patterns that are highly correlated with clinically identified subtypes, and (ii) the identified subnetworks are highly reproducible across datasets that are derived from different studies. Our results show that integration of phosphorylation data with network data can provide mechanistic insights into the differences between breast cancer subtypes in terms of how cellular signaling is affected in these subtypes. Furthermore, the reproducibility of the subnetworks we identify suggests that phosphorylation data can provide diagnostic and prognostic markers that are more robust than markers identified using transcriptomic data.

Further Evidence Supporting a Potential Role for Alcohol Dehydrogenase 1B (ADH1B) in Obesity

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Background: Insulin is an essential hormone that regulates metabolism. Insulin resistance arises when tissues fail to respond to insulin, and it leads to serious health problems like Type 2 diabetes. Obesity is an insulin resistant state. Two mechanisms contribute to obesity: (1) hyperplasia via adipogenesis and (2) hypertrophy via lipogenesis. We previously showed that *ADH1B* mRNA expression was inversely correlated with measures of obesity and insulin resistance in subcutaneous adipose tissue of Mexican Americans. **Methods:** Human subcutaneous primary adipocytes derived from non-obese (BMI < 28 $kg.m^{-2}$) or obese (BMI ≥ 30 $kg.m^{-2}$) donors were used to study the function of ADH1B in adipocytes. Changes in protein expression were analyzed by Western blot. ADH activity and adipocyte glucose uptake were measured by colorimetric assays. **Results**: A meta-analysis of four ethnic groups verified that *ADH1B* expression decreased as BMI increased. Adipocytes from non-obese donors expressed ADH1B protein at higher levels than obese donors in vitro. Moreover, ADH1B expression increased as preadipocytes differentiated into mature adipocytes. Insulin stimulated ADH1B expression in adipocytes, which yielded a concomitant increase in enzyme activity. Knockdown of ADH1B expression using siRNA resulted in a decrease of insulin-stimulated glucose uptake in

adipocytes. **Conclusions:** Our results suggest that a deficiency in ADH1B gene/protein expression and activity is a characteristic of obesity. Moreover, the data imply that ADH1B is stimulated during adipogenesis and insulin signaling to play a role in these mechanisms, which are central to the progression of obesity. These findings indicate ADH1B may be a target for therapeutic intervention.

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

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Background: The prevalence of Gallbladder Disease [GBD] is higher in Mexican Americans (MAs), and there is strong evidence for genetic influences on GBD. We fine-mapped two previously identified linkage peaks on chromosome 1 (1p36.21 and 1p34.3) that are associated with GBD in MAs to identify potential functional variants. **Methods:** About 4,500 single nucleotide polymorphisms [SNPs] were used to fine-map the chromosome 1 linkage peaks in 709 individuals from large MA families from San Antonio, TX. Data obtained from HumanExome-12 v1.1 BeadChip involving additional samples (N=955) were also used for mapping coding variants within the linked regions. SOLAR was used to conduct association analyses with two different ultrasound-based phenotypes: clinical GBD (cGBD=individuals who have undergone cholecystectomy) and total GBD (tGBD=individuals with cholecystectomy or those individuals with asymptomatic gallstones). **Results:** Association analyses showed five common noncoding variants and one rare coding variant in 1p34.3 which reached experiment-wide significance thresholds, whereas one rare variant in 1p36.21 met the threshold. Five noncoding SNPs associated with cGBD and tGBD (p-values ranged between 2.2E-5 to 5.9E-6) were localized to the potential regulatory/intronic regions of *ZMYM1, LOC653160, ZMYM6,* and *GJA4*. The coding variant in 1p34.3 showed association with tGBD (p=4.5E-4) and localized to *MACF1*. The coding variant in *AADACL3* in 1p36.21 showed association with both cGBD (p=7.3E-5) and tGBD (p=3.9E-4). **Conclusions:** Our results suggest that both common and rare variants mapping to previously identified linkage peaks are involved in increased GBD susceptibility of MAs. Some localize to genes relevant to GBD pathogenesis which warrants their functional characterization.

TACROLIMUS INDUCE TUBULAR TOXICITY MEDIATED BY APOPTOTIC GENES DYSREGULATION IN TRANSPLANTED PATIENTS

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Introduction: Calcineurin inhibitors (CNI) remain the most effective and widely used immunosuppressive agents in organ transplantation and are factors in limiting the outcome of renal transplantation. Renal biopsy remains the best method of identifying nephrotoxicity. Hypoxia produces main histological data impact the tubular interstice. The diagnosis requires an invasive procedure and an expert pathologist, importantly, it is an exclusion diagnosis. **Aim:** The present study explored the gene-expression behavior of representative extrinsic and intrinsic apoptotic pathways in the renal biopsies of 10 patients with calcineurin-inhibitors toxicity (CNIT) and compared in 11 biopsies that had no toxicity data. The mRNA expression of the renal tissue biopsies was analyzed using the RT2 Profiler PCR Array platform and the results were validated with immunohistochemistry in order to observed the protein pattern in the biopsies. and considering the genes involved in the processes associated with renal damage. **Results:** Bcl-2-associated X protein (BAX), Nucleolar Protein 3 (NOL3), and X-Linked Inhibitor of Apoptosis (XIAP) were overexpressed in CNIT patients. Mann-Whitney U test were statistically consistent for the three genes evaluated: BAX, $p = 0.002$; NOL3, $p = 0.001$; and XIAP, $p = 0.022$ in all cases that used an exact sampling distribution for U. Immunohistochemistry showed that BAX protein is accumulated selective in the tubules **Conclusion**: The intrinsic apoptotic pathway plays a relevant role in the physiopathology of CNIT affecting the tubular structures mediated by hypoxia.

THE EX-VIVO RESPONSES OF HUMAN MACROPHAGES TO *MYCOBACTERIUM TUBERCULOSIS* DIFFER BY THE HOST'S TB STATUS, AND ARE ENHANCED BY RAPAMYCIN, AN AUTOPHAGY INDUCER

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Background. TB occurs in 10 million people and causes 1.6 million deaths globally. The role of T cells in TB control is unquestionable, but there is also growing evidence for the contribution of innate immune cells, including macrophages (MΦs). MΦs are key elements in the innate and adaptive response to *Mycobacterium tuberculosis (Mtb)*: MΦs host the intracellular growth of *Mtb*. Alternatively, MΦs can kill *Mtb* when they are activated by T-cell derived cytokines like IFN-ɣ. However, the anti-*Mtb* mechanisms of human MΦs are not fully understood, and their function may be particularly compromised in patients with active TB (vs no TB). **Aims**: i) Evaluate the impact of the TB host status (+/-) on the in-vitro capacity of their monocyte-derived MΦs to contain *Mtb* growth. ii) Determine if rapamycin, an autophagy inducer, can enhance antigen-presentation and *Mtb* killing by human MΦs from +/- TB patients. **Methods**. Participants with TB or their healthy close contacts (no TB) were enrolled in Reynosa, Mexico, and their monocyte-derived MΦs were evaluated for *Mtb* growth containment and their capacity for antigen presentation in-vitro. The impact of rapamycin on these responses was further evaluated. **Results**. The MΦs from TB patients (vs healthy controls) had a differential capacity to contain *Mtb* growth in-vitro. Further supplementation of MΦ cultures with rapamycin led to enhanced *Mtb* killing and antigen-presentation to T-cells, irrespective of TB status. **Conclusions**. i) MΦ mediated autophagy is likely to be a determinant of the differential outcomes in *Mtb* responses by TB host status. ii) Further studies for rapamycin are warranted to evaluate the mechanisms by which it potentiates the anti-mycobacterial response, and its potential for host-directed therapy for TB.

ERK1 AND ERK2 ARE REQUIRED FOR LIPOPOLYSACCHARIDE-INDUCED PRODUCTION OF CYTOKINES AND CHEMOKINES BY MACROPHAGES

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Background: Chronic inflammation may be due in part to changes in composition and function of gut microflora, which provide an intestinal barrier preventing bacterial lipopolysaccharide (LPS) release. Studies demonstrate that obesity increases gut permeability leading to elevated plasma LPS levels resulting in low-grade chronic inflammation and insulin resistance. We hypothesized that insulin resistance could be produced by inflammatory factors secreted by macrophages when exposed to gut-released LPS. We examined whether inhibition of the extracellular signal-regulated kinase (ERK) signaling pathway blocked LPS-mediated responses in bone marrow derived macrophages (BMDM). **Methods:** To determine which ERK isoform is involved in the regulation of inflammatory factor production, we used siRNA to knockdown ERK1, ERK2, or both. BMDM were treated with LPS (100 ng/ml, 6hr). Inflammatory factors were measured by ELISA. **Results:** LPS induced TNF-α, RANTES, MCP-1, and IFN-β production of 106371±18250 pg/ml, 11827 ± 1168 pg/ml, 851 ± 73 pg/ml, and 454 ± 46 pg/ml, respectively. Knockdown of ERK1 induced a 4.0-fold TNF-α and 2.0-fold RANTES decreased production. Knockdown of ERK2 induced a 9.2-fold TNF-α and 1.6-fold RANTES decreased production. Knockdown of either ERK isoform did not decrease MCP-1 and IFN-β release. However, double knockdown of ERK1 and ERK2 had the greatest inhibition of TNF-α, RANTES, MCP-1, and IFN-β production (not detected, 7.7-, 1.6-, and 14.6-fold decrease, respectively). **Conclusions:** Knockdown of both ERK isoforms is necessary to abrogate the LPS effect in macrophages. We propose that ERK positively regulates LPS-mediated inflammatory responses and inhibition of ERK signaling may protect against development of insulin resistance.

RELIABILITY AND REPRODUCIBILITY OF ORAL GLUCOSE TOLERANCE TEST IN MICE. PILOT STUDY.

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Background. The oral glucose tolerance test (OGTT) is a technique for assessing disturbances in glucose metabolism to determine insulin resistance. We are implementing the OGTT in our animal studies. Most studies use a small number of mice, but there exists a lack of information regarding the variability of this technique. Our aim was to make a pilot study to analyze the reliability of the method in mice without any treatment. **Method**. After a 5 h fasting, three one-year old wildtype C57Bl6/J male mice were orally gavaged with glucose at 2g/kg of body mass. Blood sample collection was obtained in unrestrained and awake mice via tail tip. Blood glucose levels were measured at 5, 10, 15, 20, 30, 45, 60, 90, and 120 mins after glucose gavage. The procedure was repeated a week later. Intraclass coefficient (ICC) was calculated for each mouse. An ANOVA for variation due to mice, minutes, and interaction with time was calculated with STATISTICA load 10. **Results**. The ICC for average values for each mouse was between 0.7 to 0.88 ($p<0.001$); and for single measurement between 0.53 to 0.79 ($p<0.001$). The partitioned variance showed differences between mice (12%, $p<0.001$) and within each curve time (64%, $p<0.001$). The interaction between mice and time did not show differences (4.5%, $p=0.97$). **Conclusion**. We observed the reliability of OGTT in mice, and the OGTT can be classified as substantial for measuring glucose levels. We expect less variation in the future as we gain the expertise in this technique.

SEX-SPECIFIC SUSCEPTIBILITY TO CARDIOVASCULAR DISEASE IN RAT OFFSPRING BORN FROM DAMS OF ADVANCED MATERNAL AGE

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Background: Pregnancy in advanced maternal age (> 35 yrs. of age) increases the risk of immediate and long-term complications in mothers and offspring. We have shown impaired maternal vascular function and poor fetal outcomes in a rat model of advanced maternal age (AMA). We hypothesized that adult offspring born to AMA rat dams would have increased cardiovascular susceptibility at 4 and 12 months of age. **Methods:** Echocardiography, isolated working heart, and molecular techniques were used to assess cardiac function and molecular mechanisms in adult offspring born to young (3-4 months old) or AMA (9.5-10 months old) rat dams. **Results:** At 4 months of age, recovery of cardiac function following an I/R insult in male offspring born from aged dams was reduced by 57%, an effect that was not evident in female offspring. We further evaluated whether aging in the female offspring would impact cardiovascular susceptibility to I/R injury. At 12 months of age, *ex vivo* cardiac function following I/R injury and *in vivo* cardiac function were similar between groups in female offspring. In comparison, 12-months-old male offspring born from aged dams had mild diastolic dysfunction. We found no differences in markers of diastolic dysfunction, collagen I/III ratio, SERCA2a or RYR2 protein levels between the male offspring groups, suggesting the involvement of other proteins. **Conclusions:** Male but not female offspring born to AMA rat dams had an increased susceptibility to the development of cardiovascular dysfunction in adult life; highlighting the sex-specific developmental programming of adult cardiovascular dysfunction due to AMA.

VALIDITY OF PCR FOR ASSESSING PARASITOLOGICAL CURE IN CHAGAS DISEASE

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Background: Qualification of methods for assessing efficacy of drugs for Chagas disease is a priority for this neglected disease. The objective was to determine if negative results from sequential blood PCR assays for *Trypanosoma cruzi* (*Tc*, causative agent of Chagas disease) reflect parasitological cure after drug treatment. **Methods:** Monkeys that had been naturally infected with *Tc* were treated with placebo or one of three candidate drug regimens in protocols similar to those used in clinical trials. Blood samples collected sequentially during 1-year post-treatment were assessed by PCR for presence of *Tc* DNA. Monkeys that were consistently negative were immunosuppressed and further tested by blood PCR. Tissue samples from monkeys that were still negative were then subjected to PCR. **Results:** By 1-year post-treatment, the observed parasitological failure rates were 100%, 50%, 62%, and 86%, respectively. The optimal treatment for humans was documented to have failed in 50% of the monkeys by 1-year post-treatment, a cumulative percentage that is higher than the 20% documented in human studies. Six of the 15 monkeys that remained PCR negative for 1-year post-treatment were later demonstrated by PCR, before or after immunosuppression, to be infected. **Conclusions:** 1) PCR assays are useful for early determination of treatment failures. 2) Efficacy of candidate drugs in clinical trials may be over-estimated by 1-year follow-up serial PCR assays; additional studies and improved qualified biomarkers of efficacy are needed. 3) The monkey model can provide a valuable pre-clinical assessment of drug efficacy and of the validity of biomarkers for determining efficacy.

ADEQUACY OF EMERGENCY DEPARTMENT-INITIATED ANTICOAGULATION WITH HEPARIN IN PATIENTS WITH ACUTE ST-ELEVATION MYOCARDIAL INFARCTION UNDERGOING PRIMARY PERCUTANEOUS CORONARY INTERVENTION

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Background: In the United States, unfractionated heparin (UFH) is the most common anticoagulant used in patients with ST-elevation myocardial infarction (STEMI) undergoing primary percutaneous intervention (PCI). The ACC/AHA STEMI Guideline recommends an activated clotting time (ACT) goal of 250-300 secs when not using glycoprotein IIb/IIIa receptor antagonists. We assessed the adequacy of UFH-anticoagulation initiated in the emergency department (ED) in patients with STEMI undergoing primary PCI. **Methods:** Data were collected from medical records of patients diagnosed with STEMI in the ED of a single center from 2014 through 2018. Patients were included if they received an UFH bolus in the ED and an ACT was measured after obtaining arterial access in the catheterization laboratory. Those that received additional boluses of UFH before the first ACT were excluded. **Results:** Of 147 patients, 76 met our inclusion criteria. After receiving UFH bolus in the ED, the mean initial ACT was 173.8 ± 50.4 secs. The mean ACT of the patients who received UFH bolus with infusion was 170.6 ± 47.1 secs, compared to 189.2 ± 71.9 secs in those who received UFH bolus without infusion (p = 0.3). There were 8 cases of shock and 1 death. There were no major bleeding events nor in-hospital reinfarctions. **Conclusions:** Most of the patients failed to reach initial therapeutic anticoagulation after receiving UFH in the ED. However, it seems that this observation was not associated with major adverse outcomes since there was only one death, 8 cases of shock and no cases of in-hospital reinfarction.

IMPLEMENTATION OF HIGH RISK ASSESSMENT IN CANCER PREDISPOSITION SYNDROMES IN THE FIRST CANCER PREVENTION CLINIC MODEL IN MEXICAN POPULATION IN MONTERREY NUEVO LEON

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Background: Cancer is one of the main causes of morbidity and mortality worldwide. In the world 5-10% of the patients with cancer fall into a classification called Hereditary Cancer Syndromes, which are caused by pathogenic variants in predisposition genes, therefore increasing cancer risk. This cancer predisposition is transmitted generation to generation in a mendelian pattern, involving risk to the patient and his relatives. The aim of the study was identifying high risk patients and their families that attended to the Prevention and Early Cancer Detection Clinic. **Methods:** Patients who met clinical criteria for hereditary cancer syndromes received genetic counseling and were offered genetic testing with a 30 genes NGS panel (Onco Life test). Those patients, who had a pathogenic variant in the test, were offered to study their first degree relatives by Sanger sequencing. **Results:** Of 1418 patients treated between June 2016 to June 2019, 15% (213) presented clinical criteria for hereditary cancer syndrome, being the most common Hereditary Breast and Ovarian Cancer Syndrome and Lynch Syndrome. 12 % (27) of the selected patients were analyzed with the NGS panel, of which 3 families have been analyzed for the following mutations (MLH1 c.393_396, MLH1 c.1790_1791 and BRCA2 c.274 C>T). **Conclusions:** As a cancer prevention clinic the identification of high risk patients with genetic profile for clinical

predisposition variants is crucial to offer an appropriate genetic counseling, oncological management and preventive measures in the early detection of cancer.

OBESITY ASSOCIATED WITH DECREASED HEMOGLOBIN IN UNIVERSITY STUDENTS FROM REYNOSA, TAMAULIPAS

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Background: Obesity are one of the biggest public health problems, whereas Mexico occupies the second place in the world for adult obesity and first place in childhood obesity. Excess body fat is associated with cardiometabolic comorbidities, but other less common illness, like anemia has been scarcely described. Obesity and fat mass are associated as negative predictive factor of serum iron. Our aim was to analyze the association with BMI and hemoglobin concentration in college students from Reynosa. **Methods:** This descriptive cross-sectional study included 178 students who signed an informed consent approved by the IRB from UAT. Anthropometric measurements were registered and a blood sample was drawn to obtain hematological parameters. Analysis of covariance (ANCOVA) and size of effect with partial eta square was calculated with IBM SPSS 25. **Results**: 42.4% of patients presented normal weight (BMI <25), 25.6% were overweight (BMI> 25 and <30), and 31.8% had obesity (BMI> 30); mean age of 19.23 ± 3.42, and 64.2% were female. The ANCOVA showed sex interacted with age to explain hemoglobin levels with a partial eta square of 0.043 (p=0.026), adjusted by age. **Conclusions:** The risk of anemia is on function of obesity and age interaction. A possible mechanism could be patients with obesity have higher levels of pro inflammatory serum cytokines and acute phase reagent, as well as higher rates of erythropoiesis with iron restriction resulting in anemia. However, additional studies such as serum iron concentrations, which have been shown to correlate inversely with BMI, should be conducted.

OBESITY AND INSULIN RESISTANCE PREDICT LIVER DYSFUNCTION IN MEXICAN AMERICAN CHILDREN.

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Backgound. Liver abnormalities have been associated with obesity and insulin resistance (IR). Clinical signs are useful and less costly for decision-making than an ultrasound/elastography. It is controversial whether serum levels of ALT are superior to AST/ALT ratio (AAR). Our aim was to analyze clinical features and define their association with these two liver function markers. **Method**. We included 670 children from the SAFARI study (Females: 49%, age 11±3 years old and BMI 22.7±6.5). ALT and AAR were log transformed and explanatory variables adjusted by family structure were: sex, age,

BMI, HOMA-IR, acanthosis nigricans score (AN). Models were evaluated with the use of Akaike and Bayesian information criteria (AIC, BIC) of penalized-likelihood; and area under receiver operation curves (aROC) was calculated for diagnostic of abnormal liver function. SPSS computed standardized beta values (Bs) and STATA for multilevel-linear mixed model. **Results**. AAR was the model with best fitness (AIC -5.7 and BIC 24.9) compared with ALT (1178.7 and 1204.9, respectively). The best explanatory clinical variables were age (Bs: -0.12), HOMA-IR (Bs: -0.17) and BMI (Bs: -0.16), AN was drop from the model and none of variables showed collinearity. aROC for AAR<1 diagnosis was BMI 0.73, HOMA-IR 0.70, and AN score 0.64. **Conclusion**. Obesity alone is the best marker for IR associated liver dysfuntion in children and adolescents. The presence of obesity is sufficient for AAR assessment, and if less than 1 an ultrasound/elastography is recommended.

TYPE 2 DIABETES PHARMACOGENOMICS IN MEXICO

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Background: Type 2 diabetes mellitus (T2DM) is the second cause of death in Mexico. This elevated mortality is mainly due to lack of early diagnosis and effective therapeutic control leading to one of every three patients not reaching therapeutic control. The average annual economic cost from 2006 to 2010 to treat T2DM Mexican patients was $1,146,536,703 USD of direct and indirect costs. Traditional T2DM prescription approach in which drugs are tested in a trial-and-error manner in each patient until achieving the therapeutic target seems not to help in solving this health crisis. **Methods:** In this study, fourteen SNPs were screened by qPCR in 495 well clinically described T2DM Mexican patients treated with oral antidiabetic drugs (OADs) to find associations between the presence of these polymorphisms, physiological features and response to OADs. Additionally, 100 metformin users were genotyped using an array for 669,672 genetic variants to find further genotypic associations. **Results**: Heterozygous forms of *ABCC8*-A1369S and *KCNJ11*-E23K were found to be associated with an increased response to sulfonylureas. Analyzing the metformin users, eight intron variants on transporters *SLC47A1*, *SLC28A1*, *ABCG2,* and *SLC7A7* and two variants on *ARID5B* were associated to reduced levels of HbA1c by using metformin. In addition to the genotypic data, clinical parameters such as age of diagnosis, blood pressure, and BMI were determining factors to reach therapeutic controls. **Conclusions:** An individual-oriented management based on patients' phenotype and genotype could help to improve the prescribing and dosing of OADs for T2DM patients, thus increasing the chance to revert this health crisis.

ETHNIC DISPARITY IN SURGICAL MANAGEMENT OF RENAL CELL CARCINOMA: NATIONAL CANCER DATABASE

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Background: With the advent of robotic assisted surgical approach for nephrectomy (RS), patients with renal cell carcinoma (RCC) are expected to experience lower time to recovery, length of hospital stay, and number of complications when compared to the open surgery (OS). However, this minimal invasive RS option is substantially more expensive than OS and thus has a potential to lead to disparities in its utilization. We aimed to identify ethnic disparity in surgical management of RCC. **Methods:** Using National Cancer Data Base which captures 75% of all cancers in US, we compared the rate of RS in Hispanic patients versus Non-Hispanic White (NHW) adults diagnosed with non-metastatic RCC between 2010 and 2015. **Results**: For the 125,960 RCC cases identified, significant increase in RS (19% to 42%) compared to OS (50% to 30%) over time was observed for all tumor sizes ($p<0.001$). However, Hispanic patients had consistently and significantly lower RS (14% to 36%) compared to NHW over time ($p< 0.001$), after adjusting for age, income, insurance, and tumor size. **Conclusions:** Novel technological advances such as robotic surgeries which lead to improved clinical outcomes are not equally distributed among RCC patients of

different ethnicities. Further research and health policy changes are warranted to improve health equity in management of RCC.

ENGAGING THE UTRGV SCHOOL OF MEDICINE COMMUNITY IN THE PREVENTION OF SUICIDE AND IMPLEMENTATION OF WELLNESS PROGRAMS FOR MEDICAL STUDENTS AND RESIDENTS

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Background: Implementation of suicide prevention and wellness programs for medical students, residents, and fellow physicians have been widely recognized by several medical associations and accreditation organizations. Medical students have rates of depression 15 to 30 percent higher than the general population and are three times more likely to commit suicide than the rest of the general population in their age range. Furthermore, suicide is the second most common cause of death among medical students in the U.S. with an estimate of 300–400 physician suicides a year.
Method: During 2017-2018 suicide prevention education was provided to more than 100 medical students and residents. The goal was for the participants to be cognizant of possible signs of suicidality for effective intervention in order to provide emphatic concern and referral to mental health resources. The training model used was Question Persuade and Refer (QPR) a best practice suicide prevention module standardized with various populations including the Veterans Administration. Subsequently an evaluation of the participants' knowledge about suicidal behavior and readiness to do prevention interventions was conducted to a self-selected group of the participants. Results: Analysis of data from the evaluation indicated satisfaction with the knowledge gained by the participants about identifying symptoms for suicide and preparedness to intervene with those at risk. Conclusions: The need for a systematic inclusion of suicide prevention education in the orientation of medical students and residents and the implementation of wellness programs including easy access to mental health services and normalizing mental health seeking is essential.

VERTEBRAL ARCH MORPHOLOGY OF UMP 67.28 (*MOROTOPITHECUS BISHOPI*) AND ITS IMPLICATIONS FOR DETERMINING POSITIONAL BEHAVIOR IN FOSSIL PRIMATES

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Background. The well-preserved lumbar vertebra of *Morotopithecus bishopi* (UMP 67.28; ≈20.6 mya) from the Miocene site of Moroto II, Uganda was originally described as having close morphological affinities with lumbar vertebrae of extant hominoids. An alternative interpretation is that UMP 67.28 shares no exclusive proportional or structural similarities with lumbar vertebrae from any particular extant catarrhine taxon. However, majority of these works have focused on transverse process morphology to determine the relative "hominoid-ness" of this specimen, and by extension to infer the positional behavior of this individual. The present study seeks to determine possible positional behavior in *Morotopithecus bishopi*, as expressed by characteristics and proportions of the vertebral arch of UMP 67.28.
Methods. UMP 67.28 (n=1) was compared with lumbar vertebrae of gorilla (n=16), chimpanzee (n=18), orang-utan (n=4), gibbon (n=7), baboon (n=3), and another fossil primate *Proconsul nyanzae* (KNM-MW 13142J; n=1; ≈18 mya). Areas of vertebral body, pedicle, lamina, post-zygapophyses, and vertebral arch were measured; and four indices (pedicle index, lamina index, post-zygapophyses index, and arch index) were computed. Mean values of indices were compared both metrically and graphically. **Results**. Date suggest that the vertebral arch of UMP 67.28 is proportionally most similar to that of the chimpanzees; while values for KNM-MW 13142J is suggestive of its cercopithecoid affinities.
Conclusion. UMP 67.28 represents the earliest fossil evidence for orthogrady in primates; although the absence of additional vertebral remains precludes a reconstruction of the exact pattern of vertebral weight transmission in this individual/taxon.

BIOMARKERS OF NONALCOHOLIC FATTY LIVER DISEASE (NAFLD) EXHIBIT GENOTYPE-BY-ENVIRONMENT INTERACTION EFFECTS ON METABOLIC ABNORMALITIES IN MEXICAN AMERICAN CHILDREN

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Background: NAFLD is highly prevalent in Mexican American (MA) children, and it disproportionately affects MAs compared to non-Hispanic Whites. To understand the genetic epidemiology of NAFLD in response to the known risk factors: high waist circumference (WC), metabolic syndrome (MS), insulin resistance (HOMA-IR), and high triglyceride (TG) levels, we performed GEI analysis of biomarkers of NAFLD risk. **Methods:** We used data from 670 SAFARI children (6-17 years old and females 49.3%) for this study. NAFLD biomarkers-namely aspartate transaminase (AST), alanine transaminase (ALT), and their ratio (AST/ALT) were measured in ~600 children from the SAFARI study. The risk factors used as environmental exposures are waist circumference (WC), MS (i.e., number of MS components, 0-5), HOMA-IR, and TG levels. Genotype-by-environment interaction (GEI) models were implemented within a linear mixed model framework, using the program SOLAR. Hypothesis testing was carried out using the likelihood ratio test. **Results**: Under GEI modeling, interaction can be due to additive genetic variance heterogeneity (VH) or a genetic correlation less than 1 (GC<1). For ALT, GEI due only to VH was found in response to WC and TG ($p<0.01$), and due to both VH and GC<1 in response to HOMA-IR (both $p<0.05$) and MS (both $p<0.005$). For AST/ALT ratio, we found GEI due to VH in response to HOMA-IR ($p<0.05$), and GEI due to GC<1 in response to MS ($p<0.001$). **Conclusions:** We have demonstrated that the underlying genetic determinants of NAFLD biomarkers change dynamically in response to the variations in WC, TG, HOMA-IR, and MS in MA children.

VALIDATION OF QUESTIONNAIRE FOR FOOD PREFERENCES IN COLLEGE STUDENTS

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Background: The questionnaire validation is essential for accuracy in research varaibles. The ESFUERSO study will analyze cardiometabolic risk (CMRs) in freshman university students. We previously validated the Food Preferences Questionnaire (FPQ) with elementary school and their parents. Our aim was to standardize the FPQ in university students for food preference assessment. **Methods:** We analyzed FPQ reproducibility and reliability for alimentary behavior, food preferences, eating habits, behaviors to lose weight, knowledge about obesity disease, attitude towards obesity, corporal perception. Reproducibility was evaluated with test-retest. Nominal variables were analyzed with weighted kappa coefficient and McNemar chi-square; meanwhile, continuous variables were analyzed with Bland-Altman, paired Student's t test, infraclass correlation coefficient (ICC) and the Cronbach's alpha coefficient. **Results:** Questions regarding 43 food preferences showed a CCI between 0.61 to 0.9; but low CCI (0.361 and 0.433) was found into two questions for consumption of hot dogs, and pizza. CCI of 0.5 was found with consumption of fried food (tacos, sopes, gorditas, quesadillas) and hamburger. In terms of reproducibility, Bland-Altman showed slight variation on the second test with cold desserts, chocolate, corn, fried food, Oaxaca cheese, bread roll, dairy products, water, industrialized foods, butter, sodas and coffee with sugar. Regarding family history of CMRs and eating habits 92% questions showed kappa between

0.5 to 0.9. **Conclusions:** These data provide evidence that the questionnaire is reproducible, reliable to identify risks on eating behavior, food consumption, eating habits, behaviors to lose weight, knowledge about obesity, attitude toward obesity, body perception.

INNOVATION, IMPACT AND IMPROVEMENT: PRIMARY CARE BEHAVIORAL HEALTH MODEL IMPLEMENTATION IN A FAMILY MEDICINE RESIDENCY SETTING IN THE RIO GRANDE VALLEY

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Background: The Department of Family Medicine completed a quasi-experimental study evaluating the impact of integrated behavioral health, particularly the Primary Care Behavioral Health (PCBH) model on health outcomes for patients in the Rio Grande Valley. The quasi-experimental design evaluated if having a behavioral health consultant in an integrated primary care setting improves health and quality of life of patients. **Methods:** The project enrolled patient (n=366) who received primary care services at one of the two (2) UTRGV Family Medicine Residency clinics where they received a behavioral health consult in primary care for a variety of healthcare needs, including depression. Enrolled participants provided consent for pre-selected metrics to be collected over a twelve (12) month period, via chart reviews. These metrics included health information, such as: blood pressure, height, weight, depression screening scores, anxiety screening score, and demographic information. **Results**: Results were analyzed using multiple-regression and noted a statistically significant decrease in depression for the intervention group compared to the comparison group. Limitations of the study design includes differences between the comparison and intervention group on severity of mental health symptoms, year old data collection, and the differences in clinics where the services were offered. **Conclusions:** These findings provide considerable contribution to the fields of Integrated Behavioral Health, Family Medicine and research in the Rio Grande Valley with underserved, border populations. In addition to recognizing the importance of providing same-day, integrated behavioral health in primary care, the results serve as initial evidence to expand integrated behavioral health care solutions for the UT Health RGV system.

INTEGRATED BEHAVIORAL HEALTH IMPLEMENTATION AT A FQHC ALONG THE US-MEXICO BORDER: RESULTS FROM AN IMPLEMENTATION STUDY

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Background: Hispanics or Latinos are now the largest minority group in the U.S.; they constitute 16.7% of the nation's population. Individuals along the border region have some of the poorest health outcomes with high rates of chronic disease. Socioeconomic factors, education, cultural factors, lifestyle behaviors, limited access to healthcare and mental health services make it difficult for individuals to improve health disparities. The study aimed to improve health status of patients with obesity, diabetes, and/or depression through a multidisciplinary team approach. **Methods:** The study population included 756 participants of which 329 were in the intervention group and 427 in the comparison group. Participants were 99.3% Hispanic. The implementation study conducted interviews with 13 program staff members (conducted at the mid-point and end of implementation) and 3 focus groups with 18 participants after the study concluded. Impact evaluation used a non-randomized quasi-experimental design to evaluate the NuCare program's impact at NCDV. **Results**: The IBH program had a significant impact on quality of life as measured by the Duke Health Profile. The intervention was associated with a 5.36 higher mean Duke General Health score at 12 months than the comparison ($p<0.001$). **Conclusions:** The successful implementation of NCDV's IBH program has positive implications for implementing IBH strategies within FQHCs serving Hispanic populations, particularly those along the US-Mexico border.

OCCUPATIONAL HEALTH AND MENTAL HEALTH IN THE MAQUILADORA INDUSTRY OF REYNOSA, TAMAULIPAS IN ACCORDANCE WITH THE OFFICIAL MEXICAN STANDARD NOM-035-STPS-2018, PSYCHOSOCIAL RISK FACTORS IN THE WORKPLACE -IDENTIFICATION, ANALYSIS AND PREVENTION

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Background: Workers contributed to half of the world's population and are the main contributors to economic and social development. This has motivated the emergence of future and new risks in the field of health and safety at work, identifying psychosocial risks as a significant emerging risk. For this reason, this study will show the present differences and the effect they have on the occupational and mental health of workers, depending on their hierarchical levels of the maquiladora industry of the city of Reynosa. **Methods:** Using the "Reference Guide III, - Questionnaire for Identification and Analysis of psychosocial risk factors and Evaluation of the organizational environment in the Work Centers" and the "Reference Guide V - Worker Data", established in the NOM -035-18-STPS as a data collection instrument in a pilot test of 20 workers from 4 maquiladoras located in the city of Reynosa. **Results:** Obtaining as results in the areas of the measures according to their level of risk; Category 1 = Low, Category 2 = High, Category 3 = Medium, Category 4 = Low and Category 5 = Medium. A population represented 40% by the Operative position, being in a level of studies of 39% of high school, with 70% of workers of the mixed day. **Conclusion:** It can be considered as a necessary element to carry out to implement, reinforce and implement new health policies for workers.

PHARMAECONOMICS OF METASTATIC COLORECTAL CANCER TREATMENT WITH ANTI-EGFR MABS.

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Background: In Mexico, Colorectal cancer (CRC) is the third most frequent neoplasia. Panitumumab is a monoclonal antibody that blocks the epidermal growth factor receptor (EGFR) and is used to treat metastatic CRC (mCRC). Its benefit is limited to *RAS* wild-type (wt-*RAS*) patients (pxs) determined by a companion molecular diagnostics (CMDx). FDA only approves *KRAS* exon 2 testing. Evidence shows that extending to exons 3 and 4 of *KRAS*/*NRAS* may better predict benefits from anti-EGFR therapy. **Methods:** Cost of treatment without CMDx was compared to costs of standard *KRAS* (exon 2; codons 12 and 13) testing plus panitumumab and extended *RAS* (codons 12 and 13 from exon 2, 59 and 61 from exon 3 and 117 and 146 from exon 4 of *KRAS/NRAS*) testing plus the drug. Estimations were based on 10 cases of mCRC. **Results**: Calculated cost per pxs for treating mCRC without CMDx was $354,488.00 USD. By guiding the therapy with the standard *KRAS* testing only 70% of pxs were treated. Of the former, one third will be false wt-*RAS*, thus treatment will be ineffective. Treatment recommended by the extended *RAS* testing will be given to 50% of the pxs that truly needs it. Finally, when using the standard CMDx there is an 8.7% of savings by avoiding ineffective treatments, against 46.85% in the extended CMDx. **Conclusions:** Treatment of mCRC with panitumumab is more accurate when guided by the extended *RAS* CMDx. Furthermore, the excluded pxs will save expenses and time, having the chance to seek better treatment.

PERCEPTIONS OF LIVING WITH DIABETES AMONG MEXICAN AMERICANS: DIABETICS VS NON-DIABETICS

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Background: A growing body of research has begun to suggest that Hispanics may experience and think about diabetes differently from other populations. Prior studies have shown a relationship between perceptions and compliance with the medical regimen among diabetics. Yet, they have not explored the similarities and differences between non-diabetics and diabetics. Understanding the health beliefs and perceptions around living with this disease for Mexican Americans is imperative to promote compliance and engagement in preventive measures. **Methods:** Using the Health Belief Model, a survey was administrated in English or Spanish to 250 Mexican Americans adults living in Hidalgo and Cameron Counties, with diabetes 150) and without diabetes (100). Participants were recruited from 2 community clinics and a physician office. Acculturation scale was also given. Survey data was analyzed using SPSS. **Results**: Each group believed being Mexican American make them susceptible to diabetes and they can manage the disease. Blindness and eye-problems were the feared complication for diabetics while heart attack was feared among non-diabetics. Less than 35% of each group do not view diabetes as a serious condition. Having regular check-ups were believed to be a preventive measure by both groups (95%) to lower the risk of diabetes. **Conclusions:** The findings from this study reveal that diabetics and non-diabetics in the RGV hold similar perceptions, beliefs, and attitudes about living with diabetes. This can be useful in designing interventions to improve the occupation performance and quality of life in this population.

INTEGRATED BEHAVIORAL HEALTH MODELS ARE EFFECTIVE IN IMPROVING HEALTH OUTCOMES FOR LOW-INCOME, HISPANIC POPULATIONS IN MEDICALLY UNDERSERVED AREAS IN THE BORDER REGIONS OF SOUTHERN TEXAS

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Background: Integrated behavioral health (IBH) models have been demonstrated to improve mental and physical health outcomes, but few of those models have been tested in a low-income, Hispanic population. This study evaluates the effectiveness of IBH programs in a Texas border region. **Methods:** Eight subgrantees in southern Texas implemented different IBH models in various settings (e.g., community clinic, mental health authority) and conducted rigorous evaluation studies (e.g., RCT, QED) (total n=4,226). After 12 months, multivariate analyses comparing those receiving IBH care to those receiving usual care were conducted on five common outcome measures: depressive symptoms (PHQ-9), blood pressure, HbA1c, BMI, and quality of life (Duke Quality of Life scale). We conducted a pooled regression analyses with individual level data. **Results**: On average at 12 months, intervention participants receiving IBH had significantly lower HbA1c than those receiving standard care, controlling for age, sex, baseline characteristics, and contextual factors (β=-0.14, p=0.02). Intervention participants receiving IBH, on average, had a significantly lower PHQ-9 score at 12 months than those receiving standard care, controlling for age, sex, baseline characteristics, and contextual factors (β=-0.39, p=0.03). For certain subgroups, intervention participants showed significant improvements in HbA1c at 12 months compared to comparison participants, particularly among diabetics and those with depression at baseline. **Conclusions:** IBH models can be adapted to improve physical and mental health outcomes in a low-income, Hispanic population. These findings may be used to develop effective IBH approaches in this population and have policy implications on workforce development, service delivery mechanisms, and clinical-community partnerships.

CAROTENOIDS ARE INVERSELY ASSOCIATED WITH THE RISK OF BLADDER CANCER
A DOSE-RESPONSE META-ANALYSIS

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Background: Some evidence indicates that carotenoids may reduce the risk of bladder cancer (BC), but the association has been unclear. We conducted a systematic review and meta-analysis of case-control and cohort studies investigating the relationship between carotenoid intake or blood levels of carotenoids and BC risk. **Methods:** Relevant epidemiologic studies were identified by a search of PUBMED and SCOPE databases, and the Cochrane Library from inception to April 2019 with no restrictions. A fixed or random-effects model was used based on the heterogeneity test to calculate pooled RRs and their 95% confidence intervals (CIs) across studies for high vs low categories of intake or blood levels. We also performed a dose-response meta-analysis. **Results:** A total of 22 studies (n=516 740) were included in the meta-analysis. The pooled RRs of BC for the highest vs lowest category of carotenoid intake and blood carotenoid levels were 0.88 (95% CI, 0.76-1.03) and 0.36 (0.12-1.07), respectively. The pooled RRs of BC for the highest vs lowest blood lutein & zeaxanthin levels was 0.58 (0.42-0.82). Dose-response analysis showed that BC risk decreased by 2% for every 1 mg increase in daily dietary total carotenoid intake (RR=0.98; 95% CI, 0.97-0.99); by 42% for every 1 mg increase in daily dietary β-cryptoxanthin intake (0.58; 0.36-0.94); by 76% for every 1 µmol/L increase in blood levels of α-carotene (0.24; 0.08-0.67); by 27% for every 1 µmol/L increase in blood levels of β-carotene (0.73; 0.57-0.94); and by 56% for every 1 µmol/L increase in blood levels of lutein & zeaxanthin (0.44; 0.28-0.67). **Conclusions:** Dietary carotenoid intake, especially β-cryptoxanthin intake and blood levels of α-carotene, β-carotene, and lutein & zeaxanthin, were inversely associated with BC risk.

WEARABLE DYNAMIC MOTION BOOT FOR DEEP VEIN THROMBOSIS PREVENTION AND ANKLE REHABILITATION

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Background: Deep Vein Thrombosis (DVT) is the formation of blood clots in a deep vein, most commonly the legs. Devices to prevent DVT such as Continuous Passive Motion (CPM) or pneumatic foot pumps can be expensive and bulky. The objective of this project is to develop a wearable boot to produce continuous passive motion on the ankle that is easy to operate and affordable. Methods: This is a collaborative project between engineering, orthopedic and business to produce an innovative product. The engineering team is following a product design an innovation process that includes engineering analysis, prototyping and testing. The business team is developing a business model using the Business Model Canvas. Results: The team has defined design concepts and early prototyping as well as an initial Business Model Canvas. The project is ongoing into the embodiment design, functional prototype, and business model validation. Conclusions: The wearable dynamic motion boot answers a real need in the market for affordable DVT prevention. The patient no longer is tied to expensive and bulky devices exclusive of clinics and hospitals. This is an excellent example of a collaborative project between engineering, medicine and business to create and innovative product with a real value proposition and higher potential for commercialization.

DEVELOPMENT OF A BICYCLE HELMET USE TRACKER FOR CHILDREN

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Background: The organization Hard Hats for Little Heads distributes helmets to children in the RGV region to prevent injuries while riding their bikes. The objective of this project is to promote and track the use of helmets when they are needed. In general, the product will make use of technology such as sensors, Bluetooth, smartphones, apps, etc. Since this product is strongly tied to human behavior, its success will depend greatly on how much one understands the users and their motivations. Methods: This is a collaborative project between engineering, medicine and business researchers. The engineering team is following a product design an innovation process that includes engineering analysis, prototyping and testing. The business team is developing a business model using the Business Model Canvas. The medical team will look at corresponding population health and statistics. Results: The team has defined design concepts and early prototyping as well as an initial Business Model Canvas. The project is currently in the embodiment design, functional prototyping, and business model validation. The device will make use of sensors on the helmet and the bicycle to determine the situation and will (1) make the rider aware, (2) communicate to the parent or supervisor, and (3), lock or disable the bicycle. Conclusions: This is an excellent example of a collaborative project between engineering, medical and business researchers to create and innovative product with a real value proposition and higher potential for commercialization.

TRANSCRIPTOMIC AND FUNCTIONAL PROFILES OF IPSC GENERATED CARDIOMYOCYTES

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Background: The metabolic syndrome associated chronic cardiac dysfunction is a risk factor for clinical heart failure. Hispanics/Latinos are disproportionately affected by metabolic syndrome, and therefore are at a higher risk of developing cardiac dysfunction. The cardiomyocytes (CMs), which can be differentiated from patient derived induced pluripotent stem cells (iPSCs), holds high promise to provide a more predictive and clinically relevant tool for *in-vitro* disease modelling to better understand the molecular basis of cardiac dysfunction and facilitate the development of better therapeutics. **Methods:** Using our highly efficient iPSC reprogramming workflow and cryopreserved lymphoblastoid cell lines established from 17 Mexican American participants of our San Antonio Family Heart Study, functional beating CMs were generated. To better understand the functional characteristics and disease modeling potential of the generated CMs, genome-wide RNA sequencing was performed. **Results:** Differential gene expression analysis identified 4,237 genes that were significantly differentially expressed (moderated *t* statistics *p*-value ≤0.05, fold-change absolute ≥2.0) between iPSCs and differentiated CMs. The 2,127 genes that were significantly upregulated in CMs showed significantly high enrichment in cardiovascular system development and function (548 genes; *p*-value $3.41x10^{-13}$ to $1.59x10^{-72}$). The other disease and cardiac conditions enriched were cardiovascular diseases (579 genes; *p*-value $5.58x10^{-13}$ to $1.46x10^{-69}$), cardiac enlargement (195 genes; *p*-value $3.13x10^{-1}$ to $1.09x10^{-44}$), cardiac dilation (104 genes; *p*-value $3.13x10^{-1}$ to $1.52x10^{-28}$), cardiac arrythmia (94 genes; *p*-value $3.74x10^{-1}$ to $1.22x10^{-27}$), and cardiac dysfunction (82 genes; *p*-value $5.27x10^{-1}$ to $1.01x10^{-23}$). **Conclusions:** These results strongly support the potential utility of iPSC generated CMs in modeling cardiomyopathies and cardiac dysfunction.

THE IMPACT OF OBESITY AND INSULIN RESISTANCE ON CAROTID INTIMA-MEDIA THICKNESS, AT DIFFERENT AGES

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Background: Intima media thickness (c-IMT) is considered a surrogate index of cardiovascular lesion in children and adults with obesity. Our aim was to describe a dynamic overview of cardiovascular dysfunction from youth to adulthood. **Material and methods:** We included eutrophic (BMI <85th > 5th Pc) and obese (BMI ≥ 95th Pc) children between 8-12 years, and eutrophic (BMI <25 Kg/m²) and obese adults (BMI 30-35 Kg/m²) 21-45 years. ISI was calculated through an Oral Glucose Tolerance Test. c-IMC was measured by a high resolution ultrasound. A general linear model was performed to describe the relationship between age, BMI and Tanner stage, with c-IMC, ISI and HOMA-IR. We performed a model adjustment analysis of a polynomial function through a curvilinear estimation predicting that an adjustment to a 3rd order function or more would suggest similar cardiovascular damage in children and adults with obesity. **Results:** c-IMT was greater in obese children and adults (0.76±0.08mm and 0.82±0.13mm), compared to eutrophics (0.3±0.07 and 0.42±0.13 mm (p< 0.001). ISI was lower in pediatric groups and did not show differences with obese adults. The behavior of c-IMT adjusted to a cubic polynomial model with a R2=0.8. ISI, HDL and HOMA-IR better explained c-IMT behavior, in such a way that a decision tree was able to define risk groups. **Conclusion:** The polynomial function showed that vascular dysfunction in obese children is similar to that observed in adults with obesity. Our findings encourage the intervention to reduce childhood obesity and prevent cardiovascular disease in early life stages.

FERRICHROME: A NOVEL PRO-BIOTIC DERIVED AGENT FOR IMPROVING IMMUNOTHERAPY OF CANCER

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Background: Pancreatic cancer (PanCa) is one of the most lethal malignancy with a very poor survival rate in patients due to inadequate treatment options. Accumulating evidences suggest that tumor associated macrophages (TAMs) and reduce infiltration of CD8+ T-cell population provide tumor suppressive environment leading to advanced growth and metastasis of PanCa. Thus, targeting TAMs and enhancing infiltration of CD8+ T-cells to the tumor site by non-toxic agents could be an effective therapeutic approach for the management of PanCa. In this study, we demonstrate that a novel probiotic-derived agent (ferrichrome) inhibits pancreatic tumor growth in syngeneic mouse model *via* modulating TAMs and increasing infiltration of CD8+ T-cells. **Methods**: RAW264.7 cells, murine peritoneal macrophages, mouse pancreatic cancer cells (UN-KC-6141) were used for this study. Effect of ferrichrome on the expression of pro (IL-12, p40, iNOS, IL-6), anti-inflammatory cytokines (MRC1 and Arginase-1) and iron metabolism markers (ferritin and ferroportin) in macrophages and co-culture systems was analyzed by qPCR. Effect of ferrichrome on metastatic phenotypes of PanCa cells was analyzed in a co-culture model of RAW264.7 and UN-KC-6141 cells. Therapeutic efficacy of ferrichrome was determined in syngeneic mouse model. Tumor immune infiltrating cells were analyzed in excised tumors by FACS, double immunofluorescence and immunohistochemistry analyses. **Results**: Ferrichrome treatment reversed the polarization of M2 macrophages towards the M1 phenotype as observed by increase expression of IL-12p40, iNOS, IL-6 and decrease expression of MRC1 and Arginase-1. Ferrichrome significantly (P<0.01) reduced the RAW264.7 cells induced migration and invasive potential of UN-KC-6141 cells. We further investigated the molecular mechanisms of ferrichrome induced M1 macrophage phenotype. Our results revealed that ferrichrome-induced M1 polarization of macrophages via upregulation of iron-sequestration protein (ferritin) and downregulation of iron-export protein (ferroportin). Ferrichrome

administration (50 µg) intratumorally for 5 days per week for 26 days significantly (P<0.01) inhibited growth of xenograft tumors. We observed an increase of CD8+ T-cell and iNOS+F4/80+ macrophages infiltration and a decrease in the expression of CD163+ macrophages in resected tumors of ferrichrome treated mice.
Conclusion: Our results strongly suggest that ferrichrome is a novel agent which targets TAMs and enhances CD8+ T-cell infiltration. Ferrichrome could be used as an adjuvant with current therapeutic/immunotherapy regimens for the treatment of advanced cancer.

DENDRITIC CELL PRESENTATION OF FACTOR VIII (FVIII)-DERIVED PEPTIDES DEPENDS ON THE B-DOMAIN OF FVIII AND ITS CHAPERON PROTEIN, VON WILLEBRAND FACTOR (VWF), IN UNEXPECTED WAYS: THE OUTRIGGER AND GLYCOSYLATION-UMBRELLA (GUMB) HYPOTHESES

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Background: Hemophilia A patients have abnormal blood clotting due to deficient or absent FVIII activity. Bleeding can be managed, however, by infusions of therapeutic (t) FVIII. Unfortunately, neutralizing antibodies ("inhibitors") may develop against the tFVIII. **Methods:** Dendritic cell protein processing and presentation assays were performed on 12 healthy blood donors. The tFVIII used was full-length (FL) recombinant (r) FVIII (FL-rFVIII) administered without ((-)) or with ((+)) VWF, and the resulting data consists of counts of tFVIII-derived peptides presented on and extracted from human leukocyte antigen (HLA) class II (HLAcII) molecules. Difference of proportion tests were used to compare the effect of VWF as well as the Non-B-domain (NBD) and B-domain (BD) regions of tFVIII on the peptide counts. **Results**: FL-rFVIII(-)VWF yielded significantly more peptides ($p<0.05$) than FL-rFVIII(+)VWF from NBD but not BD regions. Interestingly, for the FL-rFVIII(-)VWF preparation, the NBD region yielded significantly more peptides ($p<0.05$) than the BD region, but this pattern was reversed for the FL-rFVIII(+)VWF preparation in that the NBD region yielded significantly less peptides ($p<0.05$) than the BD region. **Conclusions:** The Outrigger Hypothesis posits that in the presence of VWF the heavily glycosylated BD region acts as an "outrigger" and renders this portion of FVIII relatively more likely to be internalized, proteolytically processed and HLAcII-presented. However, in the absence of VWF, the N-linked glycans individually act to protect underlying peptide bonds in the tFVIII molecules from proteolytic processing, as posited by the GUMB Hypothesis. Our results support both hypotheses as important determinants of inhibitor pathogenesis.

NOVEL TANNIC ACID SELF-ASSEMBLIES INHIBITS THERAPY INDUCED SENESCENCE IN PROSTATE CANCER

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Background: Chemotherapy with docetaxel holds great promise and important therapeutic option for Prostate cancer (PrCa) treatment. However, chemotherapy is often associated with incomplete cell death and leads to persistent senescent phenotype. Such phenotypic cancer cells survive and promotes tumor development, recurrence, and drug resistance. Altogether, targeting these cells can enhance chemotherapy outcomes. In the current study, we established a tannic acid-docetaxel scaffold nanoparticle (TDS-NP) platform that allows for facile targeting and inhibition of drug induced senescence in prostate cancer. **Methods:** TDS NP were prepared by solvent evaporation and extrusion process.

The TDS NP formation and biocompatibility were determined using FT-IR, XRD, DSC, TEM, TGA and hemolysis. C4-2 and PC-3 cell lines were used as PrCa model systems for in vitro and in vivo studies. The superior invitro anti-cancer and metastatic potential of TDS-NPs were evaluated. The anti-senescence ability of TDS-NPs was examined through β-Galactosidase Staining. Further PC-3 xenograft mouse model was used to examine its superior therapeutic activity.
Results: A series of physico-chemical analyses confirmed the integrity of formulation. An optimized formulation exhibited a spherical shape with superior internalization capacity. In vitro functional studies confirm superior therapeutic activity of TDS-NPs over free drug. A profound inhibition of β-galactosidase activity was noticed with TDS-NPs. In vivo biodistribution studies confirm efficient accumulation of TDS NPs in mice. TDS-NPs showed robust antitumor activity against PC-3 xenografts along with increased inhibition of senescence and induced apoptosis. **Conclusions:** This novel developed tannic acid-docetaxel scaffold nanoparticle formulation inhibits therapy induced senescence in PrCa.

THERAPEUTIC EFFICACY OF BROMO-ORMELOXIFENE IN CERVICAL CANCER: AN *IN VITRO* AND *IN VIVO* STUDY

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Background: Cervical cancer (CxCa) is one of the most common cancers among women worldwide and associated with poor 5-year survival rates. Current chemotherapeutic agents for CxCa have shown systemic toxicity in cervical cancer patients. Ormeloxifene (ORM) is an oral contraceptive and exhibited potential inhibitory effects in several different cancers. Here, we have designed and characterized a novel analogue of ormeloxifene, bromo-ormeloxifene (Br-ORM), and assessed its therapeutic efficacy against CxCa *in vitro* and *in vivo* model systems. **Methodology:** The effect of Br-ORM on CxCa cells (CaSki and SiHa) proliferation and growth was determined by MTS and colony formation assays. Effect of Br-ORM on the expression of epithelial-to mesenchymal (EMT) markers, MMPs and miR-200a was analyzed by Western blot and qPCR analyses respectively. The anti-tumor efficacy of Br-ORM was investigated in orthotopic xenograft mouse model of CxCa. **Results:** Br-ORM treatment inhibited cell proliferation, clonogenic potential and induced apoptosis. Br-ORM treatment arrests cell cycle progression in G1-S phase in CxCa. In functional assays, Br-ORM reduced migratory, and invasive potential of cervical cancer cells *via* modulations of MMPs. Br-ORM markedly reduced the EMT process as evident by suppression of N-cadherin, Vimentin, Snail and β-catenin expression. Br-ORM potently reduced the translocation of β-catenin in the nucleus. Moreover, molecular docking analysis revealed that Br-ORM proficiently binds into active site of β-catenin Br-ORM treatment significantly ($P<0.01$) regressed the cervical tumor growth in orthotropic xenograft mouse model. **Conclusion:** Br-ORM could be used as a novel therapeutic modality for the treatment of CxCa.

NOVEL MECHANISTIC INSIGHT INTO THE ANTICANCER ACTIVITY OF CUCURBITACIN D AGAINST PANCREATIC CANCER

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Background: The current standard therapy for pancreatic cancer is gemcitabine, but its success is poor owing to the emergence of drug resistance. We have previously shown that MUC13 is highly associated with migration, invasion, anti-apoptotic events, and PanCa progression. Cucurbitacins have shown excellent anticancer properties in various models. In this study, we evaluated the effect of novel analogue of cucurbitacin D (Cuc D) against PanCa *in vitro* and *in vivo* model systems. **Methodology:** The effect of Cuc D on PanCa cells proliferation and growth was determined by MTS and colony

formation assays. Effect of Cuc D on the expression of MUC13, HER2 and pAKT was analyzed by Western blot and qPCR. The anti-tumor efficacy of Cuc D was investigated in xenograft mouse model of PanCa. **Results:** Cuc D inhibited the viability of PanCa cells in a dose and time dependent manner as evidenced by MTS and colony formation assay. Cuc D targets and inhibits MUC13 accompanied by pro-survival effectors such as HER2 and pAKT. For first time, our molecular docking results showed that Cuc D forms stable complexes with selected proteins (AKT, HER2 and MUC13) and proficiently docks into the binding cavity of these proteins. Interestingly, we report that treatment with Cuc D restores tumor suppressor miR-145 expression in PanCa. Treatment with Cuc D effectively inhibited the growth of pancreatic cancer cells derived tumors xenograft mouse model. **Conclusion:** Cuc D could be a utilized as a novel therapeutic method for the treatment/sensitization of PanCa.

LONG-NONCODING RNA MALAT 1 IN COLORECTAL CANCER HEALTH DISPARITY

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Background: Colorectal carcinoma (CRC) is the second leading cause of cancer related deaths in the United States with a significant health disparity between African Americans (**AA**) and Caucasians (**CA**) in relation to its incidence, drug response, and mortality. Apart from family history, obesity and diet, alteration in stress factors could be major drivers of CRC disparity. These factors are associated with the dysregulated function of the major endocrine (HPA: hypothalamus-pituitary-adrenal) axis and higher levels of biochemical stressors (cortisol, cytokines, leptin). The five-year survival rate of patients diagnosed with localized-stage disease is 90%, survival declines to 71% and 14% for patients diagnosed with regional and distant stages, respectively. This pleads for a better biomarker for the early diagnosis of the disease.
Methods: Archived human CRC tissues of different ethnicity were stained using a recently standardized Z-probe technology to identify and analyze long noncoding RNA in the CRC tissue samples. TCGA database of CRC patients was also analyzed using the bioinformatic approach. **Results:** We identified a novel long noncoding RNA (**LncRNA**) namely, **M**etastasis **A**ssociated **L**ung **A**denocarcinoma **T**ranscript **1** (**MALAT1**), which is highly over-expressed in CRC and is involved in its pathogenesis. LncRNA MALAT1 expression increased with stage and negatively correlated with the tumor size. TCGA database analysis confirmed our findings. **Conclusion:** LncRNA MALAT1 was identified to be differentially expressed in African American population as compared to Caucasian American population. The TCGA database analysis corroborated our findings and indicated high expression on lncRNA MALAT1 in African American population was responsible for the poor prognosis. The studies related to lncRNA regulation and mechanism of action are in progress.

POSTER PRESENTATION ABSTRACTS

Graduate Student Category

GENOTYPE-BY-ENVIRONMENT INTERACTION (GEI) AND PLEIOTROPY BETWEEN THE INSULIN-LIKE GROWTH FACTOR I (IGF-I) AXIS AND THE METABOLIC SYNDROME (MS) IN MEXICAN AMERICANS

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Background: An important component of the endocrine system, the IGF-I axis exerts a profound influence on the pathophysiology of the metabolic syndrome (MS). In a study of Mexican Americans from San Antonio and the Rio Grande Valley, we performed analyses of GEI and pleiotropy in the axis in relation to MS in order to better understand how genetic factors may underlie their complex interrelationships. **Methods:** The axis components studied include IGF-I, IGF binding protein (BP) 1 and 3, their ratios (IGF-I/IGFBP1 and IGF-I/IGFBP3), and 3 composite variables from a principal components factor analysis (PCFA) of the axis yielding 3 factors, IGFBP1-factor (BP1F), IGFBP3-factor (BP3F), and an axis-factor (Axis_F). The latter were obtained because PCFA yields independent factors, consistent with existing knowledge that the binding proteins exert IGF-dependent and IGF-independent effects. To study GEI and pleiotropy, we employed statistical genetic linear mixed models, where model parameters and likelihoods were estimated by maximum likelihood. **Results**: Pleiotropy in relation to a dichotomous MS variable was observed for IGFBP3 ($p<0.05$), IGF-I/IGFBP3, BP3F, and Axis_F ($p<0.01$ for the latter 3). Under GEI theory, interaction can be due to additive genetic variance heterogeneity (VH) or a genetic correlation less than 1 (GCN1). Evidence of GEI was obtained only by way of VH for IGFBP1 ($p<0.01$), IGF-I/IGFBP1, and BP1F ($p<0.05$ for the latter. **Conclusions:** IGF-I and IGFBP3 are genetically correlated with MS whereas MS influences the additive genetic variance in IGFBP1 variables mainly but also in IGF-I somewhat by virtue of the VH exhibited by IGF-I/IGFBP1.

SCREENING OF GENETIC VARIANTS A49T AND V89L ON SRD5A2 GENE OF PROSTATE CANCER PATIENTS

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Background: Prostate cancer (PCa) is the most common cancer in men in America. *SRD5A2* coding 5α-reductase enzyme. This enzyme transform testosterone in dihydrotestosterone (DHT) and this metabolite is the target for the activation of androgen receptor. The aim of this study was the genotyping of A49T and V89L variants in prostate cancer and they relationship with clinical features. **Methods:** This is a case-control study authorized by our Ethical and Research Committee with No. UR16-0007. We obtain DNA from 5 mL of blood and this DNA was quantified by spectrophotometer NanoDrop 1000. We amplified a fragment of β-globine gene how quality control. Genotyping was made with real time-PCR with TaqMan reagents for both variants and the analyses of results was made with Golden-Helix software. **Results** We

include 101 cases and 100 controls; Variant A49T had "T" allele with 3% of frequency in cases and 1% for controls, respectively; the rest of analyzed samples was wild type allele "A". We did not found heterozygotes subjects for this variant. Cases analized for variant V89L have 37.6% of wild type allele "C", 45.5% heterocygote "C/G" and 16.8% variant allele "G". In controls, 45% were wild type allele, 43% heterocygote and 12% variant allele. **Conclusions**: This report is the first that genotyping both variants in PCa patients from Mexico.

POROUS BIODEGRADABLE PCL SCAFFOLDS FOR BONE TISSUE ENGINEERING

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Background: Bone defects can be caused by infections, fracture, trauma, diseases, or congenital skeletal abnormalities and when are large, they may require aid in regenerating. Bone tissue engineering (BTE) provides an individual its own means of repair, eliminating the need for grafts. Biomaterial scaffolds is part of the BTE paradigm and provide the architectural foundation on which cell differentiation and colonization can occur. The objective of this study was to determine the amount of porogen (i.e. 70%, 80%, or 90%), porogen size range (i.e. 106-300, 300-500, or 500-710 µm NaCl), and coating material (i.e. no coating, gelatin, or hyaluronic acid) of polycaprolactone (PCL) scaffolds which will result in enhanced cell attachment and proliferation of mesenchymal stem cells (MSCs) and endothelial cells (HUVECs). **Methods:** The porous PCL scaffolds were fabricated with the solvent casting evaporation method and cell attachment and proliferation were determined with a microplate reader by measuring the absorbance at 570 nm. **Results:** Our data suggest that the amount of porogen and coating does not affect MSC attachment and proliferation. Porogen size range does affect MSC proliferation as large pore size range diminishes surface area for cell adhesion. For HUVECs, the amount of porogen and porogen size range does not affect HUVEC attachment and proliferation. However, our data suggests that gelatin is needed for long term culture and cell proliferation on PCL scaffolds. **Conclusion:** Optimal PCL scaffolds to culture both MSCs and HUVECs are gelatin coated scaffolds with 70-90% amount of porogen and 106-500 µm porogen size range.

DETERMINATION OF THE FOK1 POLYMORPHISM IN THE VITAMIN D RECEPTOR GENE AND ITS ASSOCIATION WITH SUSCEPTIBILITY TO PULMONARY TUBERCULOSIS.

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Background: Tuberculosis is a chronic disease caused by *Mycobacterium tuberculosis*, which even today is still a world-wide health problem. Now, in Mexico the prevalence of this disease increases every year and because of that it is still one of the primary causes of deaths in Mexico and in the world. As a result of the interest in this bacterium, different types of polymorphisms have been associated in terms of resistance and susceptibility against *M. tuberculosis*, as the receptor gene of Vitamin D (VDR). **Methods:** A total population of n=434 was used, divided into three groups: a control group n=151, a contact group n=100 and a group of patients with pulmonary tuberculosis n=183, to which the VDR gene was amplified in order to determine the existence of susceptibility or resistance in the study group. **Results**: The 50% of the patients with tuberculosis presented the homozygous polymorphic genotype (ff), likewise in the case of the contact group, 60% of them presented this genotype, while only 20.1% of the control group presented this genotype, finding a significant association (p=0.000). **Conclusions:** It is concluded that there is an association between the genotypic variants of the VDR

gene present in the studied population and the infection by *Mycobacterium tuberculosis*, for which the homozygous polymorphic genotype (ff) can cause susceptibility in acquiring this pulmonary infection.

ASSOCIATION OF MBL-2 GENE VARIANTS OF *HHAI* POLYMORPHISM WITH SUSCEPTIBILITY TO PULMONARY TUBERCULOSIS.

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Background: MBL protein is one of the few mediators of immune system shown against to *Mycobacterium tuberculosis* in the organism. The effects of MBL protein is active the complement pathway to destroy the microorganisms. The polymorphism *HhaI* of the MBL2 gene has been proposed as a risk factor to develop this disease. **Methods:** The subjects were a total of 160. 80 patients with tuberculosis and 80 healthy control. DNA was extracted from the peripheral blood white cells of patients and control subjects, MBL2 gene polymorphism was studied using polymerase chain reaction (PCR) and restriction fragment length polymorphism. The *HhaI* enzyme-digested product was electrophoretically run on to 2% agarose gel containing 0.5g/ml ethidium bromide for 50-60 min at 90 V along. The frequencies of the genotypes in the groups were analyzed using x^2. **Results**: No significant association of the genotypes of *HhaI* polymorphism (p = 0.60975) were observed in control group than patients' group. There was higher prevalence of *Aa* genotype in the study population. **Conclusions:** It is suggested that the polymorphism *HhaI* of MBL2 gene it's not to be considered as a risk factor of developing tuberculosis among Reynosa, Tamaulipas population.

ELECTROSPRAYED Y15 AND METFORMIN-LOADED PLGA MICROPARTICLES FOR THE TREATMENT OF PLATINUM RESISTANT OVARIAN CANCER

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Background: Ovarian cancer is the fifth leading cause of cancer mortality among women in the US. Although many patients develop drug resistance, there is no standard treatment for platinum resistant ovarian cancer (OCpt). Y15 is a focal adhesion kinase inhibitor, which affects ovarian cancer cells by increasing their sensitivity to chemotherapy. Metformin induces apoptosis in ovarian cancer cell lines and works synergistically with Y15 to induce toxicity in OCpt cancer cells. The objective of this study was to fabricate electrosprayed Y15 and Metformin-loaded PLGA microparticles to investigate the ability of biomaterials to enhance drug delivery. **Methods:** The drug loading and release kinetics of Y15 and Metformin were determined with a microplate reader by measuring the absorbance at 380 and 233 nm, respectively. **Results**: Y15-loaded PLGA microparticles had a low drug loading (~1%) because only a small amount of drug could be dissolved in the solvent used for fabrication. A low loading efficiency (29%) was obtained as the Y15 degrades during the fabrication process. A high drug loading was achieved with the Metformin-loaded PLGA microparticles (23%) as a high amount of drug could be dissolved in the solvent used for fabrication. A high loading efficiency (98%) was obtained as Metformin is a stable drug. Most of the Metformin (97%) was released within the first day of the release study. **Conclusions:** To improve Metformin-loaded microparticles release kinetics, a different solvent may need to be utilized. Y15 degrades easily, and thus, careful handling of drug/microparticles is needed to prevent decrease in drug bioactivity.

MESENCHYMAL STEM CELLS TRANSFECTED WITH OSTEOGENIC INDUCING MICRORNAS FOR BONE TISSUE ENGINEERING

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Background: Bone is an essential organ that provides support and protects our organs, allow movement of the body, and are vital in producing progenitor cells and keep mineral homeostasis. Bone fractures can regenerate by themselves when the fracture is within a certain size, however when the size of the fracture is too large, assistance is needed to heal the defect. Tissue engineering is a promising approach to heal these type of bone defects. The objective of this research is to compare 5 osteogenic inducing microRNA and determine the most efficient miRNA that will induce mesenchymal stem cells (MSCs) to transcend into the osteogenesis pathway for bone tissue engineering. **Methods:** In this study MSCs were transfected with different microRNAs and protein and mRNA levels of osteogenic markers and calcium deposition were determined. **Results:** At Day 2, microRNAs 26a and 196 resulted in higher RUNX2 mRNA expression compared to the negative control. At Day 7, all the miRNA had higher RUNX2 mRNA expression compared to the negative control. At Day 2, microRNAs 196, 335 and 218 showed increase alkaline phosphatase mRNA expression compared to the negative control. miRNA 26a, 196, and 218 had more calcium deposition at Day 14 compared to the negative control, miRNA 194 and 335. Preliminary data demonstrated that miRNA 26a and 218 had higher RUNX2 protein levels compared to the negative control. **Conclusion:** In conclusion, miRNAs 26a, 196, and 218 are promising miRNAs for bone tissue engineering by increasing mRNA expression of RUNX2 and increase mineral deposition.

ULTRA-DETECTION OF THE LONG NON-CODING RNA MALAT 1 AS AN EARLY BIOMARKER FOR THE DIAGNOSIS OF HPV INFECTION AND CERVICAL CANCER.

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Background: Cervical cancer (CC) manifests initially in the cervix through intraepithelial lesions of progressive evolution, 99% of CC cases are associated with persistent genital infections due to high-risk human papillomavirus (HPV). In addition to the detection of HPV and Pap tests, it has been proposed that the detection of viral proteins and non-coding RNAs can function as biomarkers for prediction of persistence and CC. In this work, we performed the ultra detection of lncRNA MALAT 1 in liquid based cytology (LBC) using the digital droplet PCR (ddPCR). Methods: We analyzed 67 LBC samples, divided into 4 groups: healthy control, HPV (+) without lesion, HPV (+) low-grade lesion, and HPV (+) high-grade lesion. The absolute quantification of the MALAT1 was performed using ddPCR. The level of relative expression was calculated using GAPDH as a reference gene. The results obtained were analyzed with the statistical program SPSS. Results: An association was found between the overexpression of the MALAT 1 with the HPV positivity and the high viral load. Statistically significant evidence was found between the increase in the absolute copy number of the MALAT 1 and the HPV positivity, coinfection and viral load. Conclusions: The high levels of expression and the increase of the absolute number of copies of the MALAT 1 are associated with the presence of HPV, coinfection and the viral load. The sensitivity of the ddPCR allowed to detect dysregulation of the level of expression and the absolute quantification of MALAT 1 from early stages prior to CC.

ISOLATION AND CHARACTERIZATION OF A *BDELLOVIBRIO* STRAIN WITH PREDATORY ACTIVITY AGAINST *SALMONELLA* AND *KLEBSIELLA* SP.

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Background: Antibiotic resistance is a recognized threat to disease control, and it is of global public health concern. In the US, approximately 2 million people get an antibiotic-resistant infection each year, with 23,000 deaths. Antibiotic-resistant infection caused by bacteria is on the increase with no corresponding increase in the rate of development of new antibiotics. Thus, there is the need to proffer a simpler, safer and cost-effective therapeutic solution to bacteria antibiotics resistant. In which *Bdellovibrio* seems to be a more probable therapeutic alternative. In this study, we investigate the ability of an isolated *Bdellovibrio* strain to prey on two selected antibiotics resistance Gram-negative bacteria (*Klebsiella* sp and *Salmonella* sp). The *Bdellovibrio* strain was isolated from a soil sample collected from Jarachina, Reynosa, Mexico and characterized based on morphological and molecular characteristics. Molecular identification was done based on the 16s RNA. The predation efficiency of the *Bdellovibrio* strain against *Salmonella* and *Klebsiella* within 48 hrs. of co-culturing was investigated. Our results show that the *Bdellovibrio* was motile when observed under the microscope and possesses the ability to form viable plaques on its prey. The isolated *Bdellovibrio* strain had a high predation efficiency of >78% on *Salmonella* and *Pseudomonas*. This study provides information on the ability of an isolated *Bdellovibrio* to prey on selected antibiotic resistance Gram-negative bacteria.

POSSIBLE ASSOCIATION BETWEEN A HAPLOTYPE OF THE SAT-1 GENE AND FEMALE SUICIDE COMPLETERS IN THE MEXICAN POPULATION.

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Background: Studies suggest that suicidal behaviors would have a genetic predisposition regardless of the increased suicide risk associated with the diagnosis of psychiatric disorders. It's estimated that about 43% of the variability in suicidal behavior could be explained by genetics. Alterations in expression of several genes have been associated with suicidal behavior, including Spermidine/Spermine N1-Acetyltransferase (SAT-1). This gene encodes a key enzyme in the metabolism of polyamines and its expression is decreased in the cortex of suicide completers. Because of that, SAT-1 is considered a candidate gene for suicidal behavior. In this study,we determined the association between the combinations of three SAT-1 polymorphisms (rs6627980, rs5925934, rs56258994) and suicide in a sample of suicide completers individuals of a Mexican population. **Methods:**To observe the frequency of the haplotypes of three SNPs in suicide completers, we evaluated 33 unrelated female suicide completers and compared them to 67 non-suicidal female individuals. SAT-1 rs6627980, rs5925934, and rs56258994 genotypes were analyzed using qPCR reaction method and three allele-specific probes to detect specific SNP targets. **Results**: Eight possible combinations of our three polymorphismswere generated. We observed that the haplotype ATT (rs6627980A, rs5925934T and rs56258994T) showed a statistically significant association with suicide in our sample of a female Mexican population.
Conclusions: The haplotype ATT was associated with suicide. This combination of alleles might work as a genomic biomarker to the early detection of female patients with suicide risk.

INFLUENCE OF AGE ON NON-ASSOCIATIVE LEARNING IN THE GRAY SHORT-TAILED OPOSSUM (MONODELPHIS DOMESTICA)

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Background: While there is data on the biology of learning, there is scarce information on the impacts of aging on learning and memory mechanisms in non-rodent laboratory animals. We previously reported sex differences in learning in the laboratory opossum (*Monodelphis Domestica*), a non-traditional model. Non-associative learning occurs without reinforcements or association between stimuli. The present study investigated the influence of age on non-associative learning using two well-established paradigms: Habituation-Dishabituation and Social Recognition tests. Habituation is a decrease in response to a stimulus following repeated exposures. **Methods:** We tested three age groups, including both sexes, in the habituation-dishabituation paradigm: young adults (postnatal day [PND] 100-200 days, n=7), adults (PND 201-365 days, n=7), and older adults (PND > 365, n=6). The social recognition paradigm was used to examine the *Monodelphis'* ability to recognize social stimuli; sample sizes were: young adults (n=4), adults (n=6), and older adults (n=5). We used a repeated measures ANOVA to test for statistical interaction between repeated stimulus exposures and age. **Results**: It displayed no effect in the Habituation-dishabituation Task, but there was a significant effect of age ($F=3.173$, $p<0.05$) and an interaction ($F= 4.444$, $p< 0.05$) for the social recognition task. Younger adults had higher investigation levels and both young adults and adults habituated and dishabituated. **Conclusions:** The older animals only habituated and were non-responsive to a novel stimulus animal which may suggest that older animals struggled to recognize other individuals. Therefore, *Monodelphis* may be used as a model for studying the biology of age-related deficits in social memory.

ADIPOQ SINGLE NUCLEOTIDE POLYMORPHISMS AND BREAST CANCER IN NORTHEASTERN MEXICAN WOMEN

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INTRODUCTION: Breast Cancer (BC) is the most frequent neoplasia among women worldwide. Adiponectin gene (*ADIPOQ*) polymorphisms have been shown to affect adiponectin serum concentration, and some of them have been associated with breast cancer (BC) risk. **OBJECTIVE:** The aim of this hospital case-control study was to describe the frequency of single nucleotide polymorphisms (SNPs) of *ADIPOQ* in Mexican women with BC and to determine if they are associated with it. **METHODS**: DNA samples from 397 patients and 355 controls were tested for *ADIPOQ* gene SNPs: rs2241766 (GT) and rs1501299 (GT). Hardy–Weinberg equilibrium was tested. Multiple SNP inheritance models adjusted by age and body mass index were examined for the SNP rs1501299. **RESULTS**: SNP rs1501299 was associated with BC protection (TT vs GG genotype) (p=8e-04, OR, 0.39; 95% CI 0.20-0.76). The HWE p-value for rs2241766 was less than 0.05. We found that rs1501299 genotype TT in ADIPOQ is related with BC protection in a large series of Mexican women. **CONCLUSIONS**: Investigation of SNPs in patients with BC could contribute to determine the risk profile not only for the patient but also for their relatives as part of a comprehensive approach and an increasingly more personalized medicine.

***BDELLOVIBRIO BACTERIOVORUS* BIOACTIVE POLYMERIC FILM AS A POTENTIAL CLINICAL ALLY**

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Bacterial resistance to antibiotics has become a global health crisis over the last decade, the presence of drug-resistant microorganisms delays the healing process of wounds, it is crucial that we begin to develop new strategies to combat bacterial infections, a current alternative under study to control drug-resistant microorganisms is the use of predatory bacteria, *B. bacteriovorus* is a predatory bacterium of other bacteria, which enters through the outer membrane digesting the bacteria until death. In this work we have evaluated the potential use of a bioactive polymeric film formulations to preserve and maintain microorganism viability for further applications in the clinical area. In order to observe the viability of the biofilm before and after drying process double layer plate technique for the counting of Plaque Forming Units (PFU) was used, a logarithmic reduction in three different bioactive films were observed -1.45±0.33 for CA-S, -2.43 ±0.38 for CA-G and -2.38±0.40 for StA-G, also Scanning Electron Microscopy (SEM) showed the bacterial morphology was not altered when embedded in the films. The logarithmic reduction of *Pseudomonas aeruginosa* as a host and the predatory bacteria *B. bacteriovorus* in a culture media was observed at 24hr reach a decrease from $1.5x10^9$ to 4 x 10^5 CFU. The findings support the use of biopolymer films as a good strategy to immobilize *B. bacteriovorus* and enhance its effective delivery during application in the clinical area.

ANALYSIS OF RISK ASSESSMENT MODELS WITH GENETIC INTERACTIONS FOR TYPE 2 DIABETES

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Background: Risk assessment models are the driving force behind analyses in biosciences. These models are created with interactions of proteins and loci to explain the heritability of a disease. More variant and diverse methods in data analytics are being used and implemented to enhance and advance research studies for people who are susceptible to, or have, a chronic illness. **Methods:** Genome-wide association studies, protein-protein interaction, and expression quantitative trait loci, all interacting with one another, for type 2 diabetes have been integrated into a model identifying biomarkers for risk prediction. A comparison of these general interactions and tissue specific interactions, namely the pancreas, will be made, each with their own model using the same case and control samples. The result is measured from the area under the ROC curve, indicating the performance of the model's prediction towards disease susceptibility. **Results**: The pancreas contains interacting proteins and loci where biomarkers are found in the model to create a genetic network for risk prediction. More details on the model, and its results, will be made available at the time of the symposium. **Conclusions:** Even though general protein and loci interactions of type 2 diabetes have shown promising model predictions, targeting the pancreas, as a tissue, in the model also show a powerful impact associating the pancreas with type 2 diabetes. Therefore, it is imperative that data closely linked to the disease be found and the data should also be associated with the disease to provide a basis for finding biomarkers contributing to the disease.

CARDIOMETABOLIC RISK FACTORS ASSOCIATED WITH CARDIAC ARRHYTHMIA IN PATIENTS LIVING IN THE US-MEXICO BORDER. A PILOT STUDY.

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Introduction. The border US-Mexico shared a common genetic background in American and Mexicans. The different environment can modify the presence of cardiometabolic risk factors (CMRFs) and their effect on coronary heart disease manifested by arrhythmias. In this pilot study we hypothesized the CMRFs are associated with supraventricular (SVE) ventricular arrhythmias (VE) and R-R pause. **Method**. We included patients from the Clinic of Arrhythmias at Reynosa Tamaulipas, Mexico. They underwent to a 24-h ECG Holter monitor and routine blood samples for biochemistry and anthropometric measurements were registered. The number of CMRFs was considered and smoking and serum levels of LDL-c and total cholesterol were used for analyzing the risk attributable to these factors. ORs were calculated for risk of SVEs & VEs adjusted by age, sex, BMI, CMRFs, Triglycerides level and High arterial pressure. **Results**. We included 10 patients: 6 female, 4 male, 65 years mean, chemistry results means; Glucose 175 dl/ml, Triglycerides 199 dl/ml , HDL_Col 36,6 dl/ml , Obese Type I 25% , Type II 10% , Overweight 15% Systolic Pressure 171 mmHg , Diastolic Pressure 98,3 mmHg. **Conclusion.** We found the following CMRFs are associated with Cardiac Arrhythmias VE beats Mean 2877 , SVE beats 528 and R-R Pause 262 , expected correlations are observed as ventricular arrhythmias correlate with R-R pause with a coefficients n .0.73 (p.0.016).

ATTITUDES OF HEALTH PROFESSIONALS AND STUDENTS TOWARDS PEOPLE LIVING WITH MENTAL ILLNESS IN OBAFEMI AWOLOWO UNIVERSITY TEACHING HOSPITAL COMPLEX, ILE IFE NIGERIA

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Background: This study examined the attitude of health professionals and students towards people living with mental illness in Obafemi Awolowo University Teaching Hospital complex, Ile Ife. The study assessed the knowledge of health professionals and students about mental illness, and their attitudes towards those with mental illness. It also identified and explained some factors responsible for the attitudes shown to the mentally ill. **Methods:** The target population were Health professionals working at Obafemi Awolowo University Teaching Hospital complex, Ile Ife and clinical students of the college of Health Sciences, OAU, Ile Ife. Using the Taro Yamman's sampling technique, a total of 323 respondents took part in the study but only 308 questionnaires were retrieved. Data were collected using a well scrutinized questionnaire and analyzed using Statistical Package and Service Solution (SPSS). **Results**: An assessment of the knowledge of respondents on mental health showed that out of those with a good knowledge, over half (66.0%) are health professionals. The study also revealed that 44.2% often display positive attitude towards the mentally ill. Over 60% of the respondents identified that factors such as field of specialization, educational background and special training/ workshop on mental illness can influence attitude shown to a mentally ill patient. **Conclusions:** Many of the participants claimed that attitudes were related to professional programs. Therefore, students should be exposed to more postings to the psychiatry unit and health workers should undergo training/ workshops on mental health as these will help promote a positive attitude towards those living with mental illness.

ANALYSIS OF PROTEIN KINASE CLASSIFICATION BASED ON PHOSPHORYLATION DATA FROM BREAST CANCER

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Background: Protein kinases are enzymes that help regulate the cellular activation processes through phosphorylation which serves as the mechanism whereby the activity of proteins can be modified.The hyperactivity, malfunction or overexpression of kinases can be encountered in many diseases and tumors. The traditional classification of kinases is performed on the basis of the amino acid sequences and their catalytic region similarity. **Methods:** We present an approach of classifying kinases which considers phosphorylation data from breast cancer. The strategy is to utilize different methods to process the data and calculate the correlation of the kinase substrates. In our analysis we apply hierarchical clustering building up from the phosphosite to the kinase level. Furthermore, principal component analysis is applied on the data to find the dominant pattern across kinase substrates before clustering them. We then calculate the silhouette and homogeneity indexes to find the best cut off value that maximizes the similarity of the groups from the clustering algorithm and the original classification. **Results**: Results pending. It is expected that we find associations between the groups generated from the phosphorylation data and the groups from the sequence classification. **Conclusions:** The comparison and contrast of amino acid sequence based and phosphorylation data based classification may help understand the relationship of the different kinase families.

SOCIAL CONDITIONS AS DISEASE FACTORS: A STUDY ON DIABETES IN HISPANIC AMERICANS

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Background: Persons with higher socioeconomic status have the economic, cultural and social capitals that facilitate health preservation. Diabetes is a major health risk for Hispanics, a marginalized minority with high rates of obesity-related diseases. Our objective is to analyze different social factors that may have an influence on diabetes in Hispanics.
Methods: The Health and Retirement Study (HRS) presents longitudinal data on aging population in the U.S. We analyzed health and social factors from Hispanic respondents in the HRS 2010 survey with chi-squared tests and descriptive statistics. **Results:** We analyzed a sample of 1,480 persons who identified themselves as Hispanic or Latino. Our study indicates that Hispanics with diabetes are more concerned about economic scarcity than non-Hispanic with diabetes in the sample, $X^2(1, N=6,502)= 21.11$, $p = 0.001$. While only a minority of both Hispanics and non-Hispanics express concerns about food scarcity, there is a significant difference between these groups, with more Hispanics than non-Hispanics responding that they have experienced food scarcity, $X^2(1, N=6,502)= 56.46$, $p = 0.001$. **Conclusions:** These initial observations will direct further investigation of social factors that put Hispanics at risk of developing diabetes type 2, and that influence the treatment and complications of the disease as compared with non-Hispanic Americans.

UTILIZATION OF SOCIAL MEDIA BY COUNTY-LEVEL PUBLIC HEATH AGENCIES IN PROMOTING VACCINATION & PREVENTING DISEASE OUTBREAKS

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Background: Social media has become an important communicative medium for public health. This study examines the extent to which the volume of pro-vaccine Twitter activity of county-level public health departments may act as a preventative tool against localized outbreaks of vaccine-preventable diseases (VPDs) such as the Mumps. **Methods:** This study compares the social media activity of the public health departments of Cameron County and Hidalgo County. Social media utilization is measured as the number of Vaccine-positive tweets published by each County's health department during a *proactive period* from September 1st, 2018 – December 31st, 2018. (the four moths proceeding the most recent VPD outbreak in either county). The number of cases of the VPD known as "the mumps" where counted and compared for the subsequent four-month period of January 1st, 2019 – April 30th, 2019. **Results**: In the proactive period, Hidalgo County made or re-tweeted a total of six tweets with Vaccine-positive content, while Cameron County made or re-tweeted a total of eleven. In the reactive period, Hidalgo County experienced 39 [locally contracted] confirmed cases of the mumps, while Cameron County experienced four [locally contracted] confirmed cases of the mumps. **Conclusions:** Cameron County had a higher volume of vaccine- positive tweets during the proactive period and fewer cases of the mumps during the reactive period than did Hidalgo County. Further research should be conducted over longer periods of time to gain a better understanding of the role of social media in preventing local VPD outbreaks.

ETHNIC DISPARITIES IN MENTAL HEALTH STATUS: FOCUS ON SELF-REPORTED DEPRESSIVE SYMPTOMS IN OLDER, HISPANIC/LATINO ADULTS

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Background: Individuals with age-related diseases and their caregivers experience psychological distress that makes them vulnerable to depression. Furthermore, underrepresentation of minorities in clinical research hinders our knowledge of these multiplex groups. Our goal is to increase our understanding of older Hispanic Americans with emphasis on psychological functioning and psychosocial risk factors. **Methods:** The Health and Retirement Study is a longitudinal study with a nationally representative sample of older adults. Using data from the 2010 survey, we identified a subsample of Hispanic American participants to determine how many individuals were included and what percentage reported negative affective symptoms. We completed descriptive statistics and chi-squared tests to assess the association between being Hispanic and depressive symptoms. **Results:** Our analysis indicates that out of the 22,034 participants, only 1,480 reported being Hispanic or Latino. Our findings reveal statistically significant differences in the reporting of depressive symptoms between Hispanics and non-Hispanics. Hispanic participants reported higher rates of feeling depressed,

χ^2 (1, N=6,502)= 62.53, $p < 0.001$, feeling sad,

χ^2 (1, N=6,502) = 54.09, $p < 0.001$, feeling lonely,

χ^2 (1, N=6,502)= 28.09 $p < 0.001$, feeling unmotivated,

χ^2 (1, N=6,502)= 14.10, $p < 0.001$, restless sleep,

χ^2 (1, N=6,502)= 6.96, $p = 0.008$, and feeling everything was an effort,

χ^2

(1, N=6,502)= 7.37, p = 0.007.

Conclusions: This preliminary study will guide future analyses that focus on the mental health of Hispanic American caregivers. Such information will aid in the identification of the underlying risk factors and facilitate development of effective and inclusive interventions that assist the caregiver-care recipient dyad.

SOCIO-ECONOMIC STUDY OF BREAST CANCER SURVIVAL ANALYSIS: A 20 YEAR COHORT STUDY IN TEXAS

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Background: Based on the Center of Disease Control (CDC) report, other than skin cancer, breast cancer is the most common cancer among women in the United States across all races and ethnicities. **Objective:** I take advantage of this 20-year cohort study of cancer survival data in Texas to study the main factors that can explain why some breast cancer patients live longer than others. **Methodology:** Using a survival analysis which consists of performing a log-rank test, a survival time regression and a Cox proportional hazards regression, and using a quartile methodology then a multinomial logistic regression, I analyze the variables, such as race, age, income, treatment options, and geographic location of the survivors to pinpoint the main determinants of survival time. **My results** suggest that stage at diagnostic is the most important drivers of breast cancer survival, in fact, Compared to stage1 survivors, survivors with stage IV are more likely to die with a hazard ratio of (14.02). I also find that being diagnosed with advanced grade will lead to short survival time. Furthermore, I find that there are some racial disparities in survival time, and being black non-Hispanics and being between 40 to 49 year old is not a good prognostic for a breast cancer survivor in Texas. Finally, I find that most of the disparities in terms of stage, grade, age, race and income occur in the first five year of survival. **I conclude** that Policy makers need to promote early screening and diagnostic in vulnerable communities.

EFFECT OF GENDER AND BODY MASS INDEX ON FOOD PREFERENCES IN COLLEGE STUDENTS. PILOT STUDY

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Background. Previously we described differences by sex and family role on the questionnaire of food preferences (QFP) designed in the study ESFUERSO. The QFP includes frequency and size of selected food giving a score. In this pilot study we analyzed if the QFP has sensitivity to detect differences between sex, WHO classification of body mass index (BMI) and their interactions assessed in college students from Reynosa. **Methods**. We invited college students for BMI measurement and fill the QFP. The QFP includes 41 questions to obtain a score of food portions and frequency of consumption, besides, includes 20 questions about attitudes on obesity and food. Sex and BMI groups (normal, overweight and obese) were analyzed as fixed factors for a two way ANOVA. Coefficients for Main factors and their multiplicative interaction was computed with IBM SPSS version 23. **Results**. We included 46 students (28 F and 18 M), age 18-25 year, It was found that of the 41 questions evaluated 14.7% were sensitive to detect sex differences (fast

food, desserts and beverages), 12.2% for BMI group differences (protein, cereals and dairy products) and 12.2% showed sensitivity for interaction (protein, fast food, desserts and dairy products). **Conclusions**. This pilot study suggests at least 39% of the questions included in the QFP of the ESFUERSO project showed sensitivity to detect differences by sex, BMI or their interaction. This tool will help to detect differences in food preferences for future programs of prevention.

STRESS ASSOCIATED REGULATION OF LONG NONCODING RNA MALAT1 BY TRANSCRIPTION FACTOR NFATC1 IN COLORECTAL CANCER HEALTH DISPARITY

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Background: A significant Colorectal Cancer (**CRC**) health disparity exists between African Americans (**AA**) and Caucasians (**CA**) in relation to its occurrence, drug response, and mortality. This is possibly due to excessive biochemical stressors produced such as cortisol, leptin, and cytokines, which is associated with socio-behavioral conditions and an accompanying dysregulated function of the major endocrine axis. Adverse social conditions leading to biochemical stressors may influence molecular drivers and the epigenome *via* histone modifications, DNA methylation and the expression of long noncoding RNAs (**LncRNA**) attributing to CRC progression. Understanding the mechanistic roles of these molecular drivers influenced by biochemical stressors can provide pivotal information to CRC disparity. This study helps to understand influence of biochemical stress factors on long noncoding RNA MALAT1 and transcription factor NFATc1 etiology, which will help in designing novel preventive/therapeutic strategies to reduce CRC disparity among AA population. **Methods:** Archived human CRC tissues were stained with novel Z-probe technique for lncRNA MALAT1, and immunohistochemistry for NFATc1 detection. Lentiviral based overexpression was used for gain of function and CRISPR/Cas9 was used for knockdown studies. Phenotype of cell lines was analyzed using proliferation, migration, invasion and colony formation assays. **Results:** We have identified that LncRNA-MALAT1 is differentially expressed in African American (AA) CRC tissues compared to Caucasian (CA), which is correlated with NFATc1 expression. Multiple NFATc1 binding site were identified by ChIPseq database. Overexpression of transcription factor NFATc1 upregulated lncRNA MALAT1 expression. CRISPR/Cas9 based knockdown of NFATc1 downregulated NFATC1 and lncRNA MALAT1, but vice versa was not true, indicating NFATc1 to be upstream of lncRNA MALAT1. Also, in a mouse model, expression of MALAT1, NFATc1 and IL-6 is highly upregulated by biochemical stressor cortisol. **Conclusion:** We initially hypothesized that aberrant expression changes in MALAT1 and NFATc1 are influenced by chronic exposure to biochemical stressors (cortisol, cytokines, leptins) induced by social stress leads to CRC disparity, which appeared to be true. Further studies are in progress for direct association of NFATc1 on MALAT1 promoter and mechanism by which the stress factor regulate NFATc1 expression and hence lncRNA MALAT1 expression.

ANALYSIS OF POTENTIAL BIOMARKERS FOR PREDICTING SUICIDAL BEHAVIOR.

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Background: It's estimated that about 43% of the variability in suicidal behavior could be explained by genetics. Alterations in the expression of several genes have been associated with suicidal behavior, including Interleukin 1B (*IL-1B*) and the ATP binding cassette transporter 1 (*ABCA1*). Proinflammatory cytokines, such as *IL-1B*, play an important role in the physiopathology of depression and it has been seen that high levels of *IL-1B* are associated with mood disorder spectrum. On the other hand, *ABCA1* is responsible for the major part of the cholesterol homeostasis through efflux, and it's suggested that the release of cholesterol may be key to the association between free cholesterol and suicide attempt. This study investigated the association between genetic variants rs16944 (*IL-1B*) and rs4149268 (*ABCA1*) in suicide completers and non-suicidal individuals to determine their probable association with suicide. **Methods:** We evaluated 153 unrelated suicide completers and compared them to 124 non-suicidal individuals. Genotypes were analyzed using the Real Time-polymerase chain reaction method and two allele-specific probes to detect specific SNP targets. **Results**: SNP rs16944 (*IL-1B*) showed no difference in genotype frequency between groups. On the other hand, rs4149268 (*ABCA1*) (odds ratio=2; 95% CI 1.18-3.37) had with the highest frequency (56.1%) the homozygote genotype T/T (variant allele) in cases, while the most frequent genotype in controls was the heterozygote with 45.4% (p=0.03). When rs4149268 was analyzed only in men, OR= 2.61 (95% CI 1.28-5.34). **Conclusions:** The present study suggests that variant T allele of rs16944 increases the risk of committing suicide, especially in men.

POSTER PRESENTATION ABSTRACTS

Medical Student Category

A NOVEL LOCUS INFLUENCING CHRONIC KIDNEY DISEASE RISK IN MEXICAN AMERICAN FAMILIES

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Background: Chronic Kidney Disease (CKD), a global health problem, presents as a spectrum of renal dysfunction characterized by decreased glomerular filtration rate and irreversible kidney damage. Estimated glomerular filtration rate (eGFR) measures kidney function and CKD status/risk. It has previously been established that eGFR is influenced by genetics. We hypothesized that identifying genetic factors underlying eGFR are opportunities to further understand the biology of CKD. To explore this hypothesis, we used data from the San Antonio Family Heart Study (SAFHS) to identify genetic influences of eGFR in this cohort. **Methods:** eGFR was determined using the MDRD equation for 765 Mexican Americans from SAFHS in approximately 26 large families. Variance components modelling was employed in SOLAR to calculate the heritability of eGFR. Empirically derived kinship estimates were used to control for the non-independence of related individuals. Polygenic models in SOLAR included age, sex, their interactions and ancestry as covariates. We conducted a 1cM genome-wide linkage scan using location-specific empirical estimates of identity-by-descent probabilities to identify genomic regions that may contribute genetically to variation in eGFR. **Results**: We confirmed that eGFR is significantly heritable, (h2=0.193; P=.0006). This indicates that 19% of the variation in eGFR is due to genetic factors. We identified a novel linkage signal at chromosome 21q22.2 with a LOD=4.33, suggesting that causal genetic variation influencing kidney function is likely to exist in this genomic region. **Conclusions:** A novel linkage region for eGFR is located at chromosome 21q22.2. Positional candidate gene exploration of this region is underway to identify causal gene(s) influencing CKD risk.

IMMUNE CELLS RESPONSE TO GUT MICROBIOTA OF DIABETICS, AT RISK AND HEALTHY SUBJECTS

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Introduction: Type 1 diabetes (T1D) has a multifactorial etiology. Genetics and environmental factors play a key role in the disease pathogenesis. Belkaid, Y. and Naik, S have shown that a small number of commensal bacteria diffused through the intestinal mucosal barrier during nutrient absorption. Thus, our study focused on the role of gut microbiota, also known as commensal bacteria, in the disease pathogenesis. Stool samples from a diabetic patient, an auto-antibody positive, a healthy mother and sibling, paired based on household, were used to stimulate healthy immune cells. The changes in CD11b+CD11c+, CD3+CD4+ T cells, CD3+CD8+ T cells phenotypes and genes expressed were assessed. **Methods:**

Equal amount of stool from diabetics, autoantibody-positive, and healthy patient were mixed with PBS and heat-inactivated. The mixtures were read at an Optical Density of 600. The samples were diluted to 1.10^6 and used to stimulated healthy PBMC isolated with Ficoll-hypaque density gradient. FACS staining for CD11b+CD11c+, CD3+CD4+ T cells, and CD3+CD8+ T cells was done 1-day post-incubation at 37 C. Cytokines assay with a Luminex kit was performed 3 days post-incubation. PBMC retrieved from gnotobiotic mice incubated with stool samples mentioned above were RNA sequenced for differential gene expression. **Results:** We have noted an increase in CD11b+CD11c+HLA-DR+ expression between healthy mother and control pair ($p < 0.0392$). CD11b+CD11c+CD80+ expression was increased in T1D sample and healthy mother compared to control ($p < 0.05$). We saw an increase in CD11b+CD11c+CD80+PDL1+ expression between our control and healthy group ($p < 0.05$) or T1D samples ($p < 0.05$). No change in CD3+CD4+ T cells and CD3+CD8+ T cells expression was observed. Moreover, despite an increase in IFN-gamma in healthy mother compared to control, no significant change in IL-2 was noted. IL-10 was significantly elevated between control samples and either healthy group or T1D ($p<0.05$). IL-6 and TNF-alpha were both elevated in T1D or healthy mother compared to the control sample ($p < 0.05$). Lastly, CTLA-2alpha, PF4 (CXCL-4), and Ttn genes were upregulated in at-risk gnotobiotic mice compared to healthy. **Conclusion:** Despite the change in CD11b+CD11c+ cells, no changes in CD3+CD4+ T cells and CD3+CD8+ T cells phenotypes were noted. We believe that other cells expressing TLR responded to our stimulation, thereby limiting the adaptive response. Alternatively, it could be that heat-inactivated bacteria did not release enough protein to stimulate CD3+CD4+ T cells and CD3+CD8+ T cells. Thus, we recommend future researchers to include cells with TLR such as NK cells, monocytes, macrophage in their analysis. We also recommend working with more pairs.

BAYESIAN MODEL SELECTION (BMS)
OF SYSTEM VARIABLES REPRESENTING ADAPTIVE IMMUNITY, INNATE IMMUNITY, AND HEMOSTASIS
IN PREDICTION MODELS OF THE METABOLIC SYNDROME (MS)

Stephanie Onyechi[1], Unyime-Abasi Eyobio[1], Jewel Udenwagu[1], Vincent P. Diego[2,3], Marcio Almeida[2,3], Tom E. Howard[3,4,5], John Blangero[2,3] [1]School of Medicine, University of Texas Rio Grande Valley, Edinburg, TX 78539
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Background: The MS, a risk factor for type 2 diabetes and cardiovascular disease, has increased to epidemic proportions in Mexican Americans (MAs). As a working hypothesis, we propose that system variables (SVs) representing adaptive-immunity, innate-immunity, and hemostasis may be used as predictors of the MS in MA participants from San Antonio and the Rio Grande Valley. **Methods:** The bioinformatics website "Reactome" was interrogated for genes in these systems. We had expression data from 456, 595 and 328 genes in the adaptive-immune, innate-immune, and hemostasis systems, respectively. SVs are defined as composite variables from principal component factor analyses (PCFA). PCFA yielded in the order given 118, 109, and 98 SVs explaining at least 80% of the total variance in each system. To demonstrate proof of principle, BMS was performed on the first 20 SVs per system to select the best set of predictors in a model of the liability to MS. **Results**: The factors from each system will be referred to by the first four letters of the system followed by its number (e.g., ADAP1, INNA3, or HEMO8). BMS produced four SVs predictive of MS, namely ADAP9 (posterior probability (PP)=0.84), INNA1 (PP=0.28), INNA10 (PP=0.47), and HEMO11 (PP=0.92). **Conclusions:** We have demonstrated that BMS performs well as a model selection algorithm to determine the best set of predictors of MS. For future analyses, BMS will be extended to the full set of SVs for each system, and the genes comprising the BMS-selected SVs will be determined by referring to their PCFA loadings.

ENVIRONMENTAL AND GENETIC CORRELATIONS BETWEEN THE METABOLIC SYNDROME (MS) AND SYSTEM VARIABLES (SVS) REPRESENTING ADAPTIVE IMMUNITY, INNATE IMMUNITY, AND HEMOSTASIS

Jewel Udenwagu[1], Stephanie Onyechi[1], Unyime-Abasi Eyobio[1], Vincent P. Diego[2,3], Marcio Almeida[2,3], Tom E. Howard[2,4,5], John Blangero[2,3] [1]School of Medicine, University of Texas Rio Grande Valley, Edinburg, TX 78539 [2]South Texas Diabetes and Obesity Institute, School of Medicine, University of Texas Rio Grande Valley, Edinburg, TX 78539, [3]Department of Human Genetics, School of Medicine, University of Texas Rio Grande Valley, Edinburg, TX 78539 [4]VA Texas Valley Coastal Bend Healthcare System, Harlingen, TX 78550, [5]Haplogenics Corporation, Brownsville, TX 78520

Background: The MS is prevalent in Mexican Americans (MAs) and is projected to increase. It is important therefore to better understand its genetic and environmental determinants. We hypothesized that the MS reflects dysfunction in important biological systems. To evaluate this concept, we analyzed gene expression data for the adaptive-immune, innate-immune and hemostasis systems in relation to the MS in a study of MAs from San Antonio and the Rio Grande Valley. **Methods:** We analyzed expression data for 456, 595, and 328 genes found at the "Reactome" website for the stated systems. SVs are defined as composite variables from principal component factor analyses (PCFA). PCFA yielded in the order given 118, 109, and 98 SVs explaining at least 80% of the total variance in each system. For a preliminary analysis, we used a bivariate model for the liability to the MS and each SV one at a time, which allows estimation of genetic and environmental correlations for the trait pair. To control for multiple hypothesis testing, we controlled the false discovery rate (FDR) to an FDR□0.1. **Results**: The SVs from each system are referred to by the first four letters of the system followed by its number. There were no significant genetic correlations with the MS. However, significant environmental correlations (where r_e denotes the environmental correlation coefficient) with the MS were observed for ADAP6 (r_e = □0.46), ADAP18 (r_e = 0.49), INNA15 (r_e = □0.43), and HEMO11 (r_e = □0.43). **Conclusions:** We found that the MS is environmentally correlated with SVs of the adaptive-immune, innate-immune, and hemostasis systems.

GENOTYPE-BY-ENVIRONMENT INTERACTION IN SYSTEM VARIABLES REPRESENTING ADAPTIVE IMMUNITY, INNATE IMMUNITY, AND HEMOSTASIS IN RELATION TO THE METABOLIC SYNDROME

Unyime-Abasi Eyobio[1], Jewel Udenwagu[1], Stephanie Onyechi[1], Vincent P. Diego[2,3], Marcio Almeida[2,3], Tom E. Howard[3,4,5], John Blangero[2,3] , [1]School of Medicine, University of Texas Rio Grande Valley, Edinburg, TX 78539 [2]South Texas Diabetes and Obesity Institute, School of Medicine, University of Texas Rio Grande Valley, Edinburg, TX 78539, [3]Department of Human Genetics, School of Medicine, University of Texas Rio Grande Valley, Edinburg, TX 78539 [4]VA Texas Valley Coastal Bend Healthcare System, Harlingen, TX 78550, [5]Haplogenics Corporation, Brownsville, TX 78520

Background: The high prevalence of the metabolic syndrome (MS) in Mexican Americans (MAs) is likely to have important ramifications for their chronic disease biology. This expectation stems from the fact that the MS pathophysiology results in fundamental perturbations to important biological systems. We evaluate this idea by treating the MS as an environmental exposure in genotype-by-environment interaction **(**GEI) models of system variables (SVs) representing the adaptive-immune, innate-immune, and hemostasis systems. **Methods:** Principal components factor analysis (PCFA) was performed on gene expression variables from the stated systems, where the constituent genes were identified using the "Reactome" website. SVs are defined as the composite variables from the PCFA of each system. GEI modeling was implemented within statistical genetic mixed linear models, and model likelihoods and parameters were estimated by maximum likelihood. Statistical inference was carried out by way of likelihood ratio hypothesis testing. **Results**: The SVs from each system will be referred to by the first four letters of the system followed by its number. Under GEI theory, interaction can be due to additive genetic variance heterogeneity (VH) or a genetic correlation less than one (GCN1). The only GEI due to VH was found for INNA11 (p=0.02). GEI due to GCN1 was found for ADAP12 (p=0.01), ADAP18 (p=0.02), INNA16 (p=0.03), HEMO4 (p=0.04), and HEMO20 (p=0.02). **Conclusions:** In this study, we have

shown that, treated as an environmental exposure, the MS significantly influences the genetics of SVs for the adaptive-immune, innate-immune, and hemostasis systems.

SUGAR-SWEETENED CARBONATED DRINKS CONSUMPTION AS A POSSIBLE RISK FACTOR OF SPORADIC BREAST CANCER IN WOMEN AT THE HOSPITAL UNIVERSITARIO "DR. JOSÉ ELEUTERIO GONZÁLEZ"

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BACKGROUND: Breast Cancer (BC) is most frequent neoplasia among women worldwide. Environmental factors such as obesity-associated inflammation, dietary factors, and nutrition have been associated with breast cancer risk. México ranks first place in obesity and intake of sugar- sweetened carbonated drinks (SSCD). It has been reported that consumption is associated with hormonal disbalance. The aim of the study was to determine the frequency of SSCD consumption in women with breast cancer from northeast Mexico. METHODS: The protocol was approved by the ethics committee of our institution and 28 cases and 24 controls were included. The patients were interviewed to collect the information from the questionnaire to identify the risk factors. Levene and t-student tests were performed with SPPS v20 software. RESULTS: The age of the cases was 52 ± 13 years and 49 ± 12 for controls, We found that 28.6% of the cases and 25% of the controls presented a body mass index (BMI) ≥ 30-34.9 Kg/m2 corresponding to obesity type 1 (p= 0.351). We found that cases consume twice more SSCD than the control group (p=0.003). There is a statistically significant difference in the consumption of SSCD in cases versus controls. CONCLUSIONS: A statistically significant relationship was found between SSCD consumption and breast cancer. The results obtained show a trend that increases SSCD consumption, increases 4.6 times the risk to present BC (CI 95%, 1.10-19.97). This is a pilot study in which we must include a larger number of patients to confirm our findings.

TC-PTP PROMOTES UVB-INDUCED APOPTOSIS VIA THE REGULATION OF P38 SIGNALING

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Background: T-cell protein tyrosine phosphatase (TC-PTP) is one of the nonreceptor PTPs and plays a key role in the regulation of various cellular functions, including cell proliferation and apoptosis. The objectives of this investigation are to reveal the role of TC-PTP and signaling pathway mediated by TC-PTP on UVB-induced skin carcinogenesis. **Methods:** Transgenic mice that specifically overexpress TC-PTP in epidermis (*K5HA.Ptpn2*) and immortalized primary keratinocytes (IPKs) derived from either control (WT) or *K5HA.Ptpn2* mice were used to investigate the role of TC-PTP on UVB-induced apoptosis. TC-PTP-mediated signaling and functions were determined by western blotting and cell viability assay. **Results**: TC-PTP WT and *K5HA.Ptpn2* mice were irradiated with UVB. The number of apoptotic cells was significantly increased in the epidermis of *K5HA.Ptpn2* mice compared to WT mice. Moreover, the epidermal thickness induced by UVB was significantly decreased by overexpression of TC-PTP *in vivo*. To further examine the aforementioned role of TC-PTP, we treated UVB to IPKs derived from both WT and *K5HA.Ptpn2* mice. Consistent with *in vivo* results, UVB induced the apoptotic marker proteins such as PARP, cleaved caspase-3 and simultaneous increased the level of p38 phosphorylation, a mediator of UVB-induced apoptosis, in TC-PTP-overexpressing IPKs. The increased phosphorylation of p38 was observed in the epidermis of *K5HA.Ptpn2* mice compared to WT mice in response to UVB. **Conclusion:** The overexpression of TC-PTP and subsequent increase in p38 signaling

contributes to enhanced epidermal apoptosis by UVB. It could play a role in future interventional approaches to skin carcinogenesis.

SAFETY AND OUTCOME OF STEREOTACTIC BODY RADIATION THERAPY (SBRT) FOR PROSTATE CANCER PATIENTS

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Background: A more recent treatment option for prostate cancer is Stereotactic body radiotherapy (SBRT), which consists of a shorter course of radiotherapy and may prove to be a much more effective treatment for early-stage prostate cancer. SBRT has the potential to serve as an alternative to standard treatments for prostate cancer, while being non-invasive, having a shorter treatment course and being cost-effective. **Methods:** We report the institutional experience on the safety and outcome of SBRT for low, intermediate, and high-risk prostate cancer patients treated with 45Gy in 5 fractions with a curative intent. An existing IRB approved retrospective protocol was utilized to conduct a registry search to identify all the patients with prostate cancer that received 45Gy of radiation therapy in five fractions between 2007-2019. Genitourinary (GU) and gastrointestinal (GI) toxicity following SBRT was retrospectively collected from follow up visits and patient reported quality of life questionnaire (AUA and QOL) using Common Toxicity Criteria for Adverse Events v. 5.0. Baseline and post-treatment sexual function was assessed using SHIM questionnaire. **Results:** A total of 250 low, intermediate, and high-risk prostate cancer patients were included for analysis. *[Still waiting on statistics]*. **Conclusions:** Through evaluation of the efficacy and toxicity (specifically GI and GU toxicities) associated with the use of 45Gy SBRT in the treatment of prostate cancer, we are better able to optimize the balance between tumor eradication and minimizing toxicity to determine the ideal radiation dose for future clinical trials and patients.

RISK FACTORS FOR HOSPITAL READMISSION IN PATIENTS DIAGNOSED WITH DEMENTIA

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Background: Dementia patients are at high risk for hospital readmission. Our study focused on determining the risk factors for readmission in this population. Tools used to assess risk included the HOSPITAL score, Charlson Comorbidity Index, and determining if patients were on high risk medication. **Methods:** A descriptive retrospective cohort study was conducted on patient data from 2017 to 2018 at the University Health System Hospital in San Antonio. 132 patients were identified to have a diagnosis of dementia and all patients were discharged to skilled nursing facilities. 10 of these patients were readmitted within 60 days. A chart review was conducted to calculate HOSPITAL Score and Charlson Comorbidity Index score. High risk medication was determined using the Beers criteria list. Statistical analysis was conducted to determine if the variables were significant for hospital readmission. **Results**: HOSPITAL score was not predictive in assessing risk for hospital readmission. HOSPITAL score was higher for readmitted patients, but was not statically significant. The only variable that was statistically significant was hemoglobin at discharge. Statistical analysis is still being conducted on the Charlson Comorbidity Index and high risk medication. Our study was limited by the small sample size and possibly the underdiagnoses of dementia. **Conclusions:** Hospitalization is associated with poorer health outcomes in dementia patients. Our study focused on risk factors in attempts to identify and target patients at risk for preventable readmission. Targeting these patients would reduce poor health outcomes associated with rehospitalization and unnecessary transitions of care.

IMAGING IN RENAL CELL CARCINOMA

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Purpose: Review imaging techniques used in the evaluation of Renal Cell Carcinoma (RCC), including ultrasonography, computed tomography (CT), magnetic resonance imaging (MRI), and positron emission tomography (PET). **Methods:** Literature Review and radiology archive review for representetive images. **Results:** Ultrasonography is the most frequently used imaging modality for the initial diagnosis of renal masses. The modality of choice for the charecterization of the renal mass is CT. Recent advances in CT technology have led to its widespread use as a powerful tool for preoperative planning, reducing the need for catheter angiography for the evaluation of vascular invasion. CT is also th best imaging modality for staging and follow-up. MRI is mainly used as problem-solving tool in selected cases of undefined renal lesions. Newer MRI techniques such as arterial spin labeling and diffusion-weighted imaging have the potential to characterize renal lesions without using contrast media, and these techniques warrant further investigation. PET may be a useful tool for evaluating patients with suspected metastatic disease, but it has modest sensitivity in the diagnosis and staging of RCC. The newer radiotracers may increase the accuracy of PET for RCC diagnosis and staging.
Conclusion: The main imaging modality used for the characterization, staging, and surveillance of RCC is CT. Other imaging modalities such as MRI and PET are used for selected indications.

CARDIAC ARRHYTHMIAS IN OCTOGENARIAN PATIENTS FROM REYNOSA, TAMAULIPAS, MÉXICO

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Background: Cardiac arrhythmias (CA) increase morbidity and mortality in octogenarian patients; cardiac disease and/or arterial hypertension increases even more morbidity and mortality. Healthy patients could develop arrhythmias due cardiovascular system aging, affecting hearth pacemaker and needing artificial pacemaker. Sustained atrial fibrillation (SAF) is the most common arrhythmia on octogenarian patients due it increases its frequency with aging causing cerebral thromboembolism. **Methods:** Forty-two octogenarian (83.2±1.1 years) patients (24 female/18 male) previously diagnosed with CA were studied during 24 h with a prolonged electrocardiographic study (Holter-24 h). We detected 50 different CAs, and then they were classified based on the Holter trace on seven types (SND = sinus node disease, V = ventricular, AF =atrial fibrillation, SV = supraventricular, SIN = sinus, A/V = type I, type II (subtypes I and II); type III of atrial-ventricular blockings, O = other types of CAs, SA = without CA). Statistical parameters of variables were calculated. After, data were subjected to principal component analysis (PCA). **Results:** Two patients not showed CAs (4.8%); the other 40 showed from one to four different arrhythmias. The most frequent CAs were AF (17.5%); SND, V, A/V (15% each one). PCA indicated that more explicative Holter's variables were LAHR, LTS, PBS, TAQS, PERS, TRIGS, LF, HF, rMSSD, PNN50, and CV. Patients with AF showed a different behavior compared with the other CAs. **Conclusions:** Octogenarian patients showed a high frequency and broad diversity of cardiac arrhythmias; data from Holter-24 h could help to better diagnostic and treatment of patients with CAs.

THE MULTIMODALITY IMAGING FEATURES OF MRI-GUIDED BREAST BIOPSIES YIELDING STROMAL FIBROSIS

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Background: Stromal fibrosis (SF) is a benign breast lesion described as a proliferation of fibrous connective tissue that results in hypoplastic changes of adjacent mammary ducts and lobules. Historically, SF was diagnosed as a palpable mass, but the advent of annual mammographic screening has contributed to an understanding that SF can be clinically silent. Unfortunately, the imaging features of SF demonstrate varied appearance across modalities. Additionally, the imaging features also closely resemble breast carcinoma and ductal carcinoma in situ (DCIS). This creates difficulties in diagnosis and an underestimation of malignancy. **Methods**: Our retrospective study aims to describe the imaging findings of pathologically-proven stromal fibrosis on mammogram, ultrasound, and MRI in a cohort of 80 patients who underwent MRI-guided biopsy at MD Anderson Cancer Center in Houston, TX. **Results**: MRI results found that the lesions predominantly presented as non-mass enhancements (56.25%), with variable shape (oval, round, or irregular), heterogenous margins (68.57%), and focal distribution (46.67%). The median of size of the lesion was significantly different between the mass and non-mass enhancement groups by Wilcoxon rank-sum test ($p < 0.0001$). The comparison of frequencies of the patterns on the delayed kinetic curve between mass and non-mass enhancements found a significant difference between the two groups by Fisher's exact test ($p= 0.0062$). The persistent pattern was more frequent in non-mass enhancement group, and the washout was more frequent in mass group. **Conclusions**: SF fibrosis presents with variable, non-specific imaging features, but kinetic curve analysis can be evaluated to help differentiate between SF and malignancies.

PEDIATRIC TYPE II SUPRACONDYLAR HUMERUS FRACTURES: FACTORS ASSOCIATED WITH SUCCESSFUL CLOSED REDUCTION AND IMMOBILIZATION

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Background: The purpose of this study was to assess the factors associated with successful closed reduction (CR) and immobilization and to assess the efficacy of a novel radiographic "hourglass" angle measurement in the management of type II supracondylar humerus fractures (T2SCHFx) within the pediatric population. **Methods:** An IRB-approved, retrospective review all children who underwent CR and casting or splinting of an isolated T2SCHFx treated at two pediatric hospitals from January 1, 2009 to August 31, 2016. The parameters included Baumann angle (BA), perpendicular distance from the anterior humeral line to the capitellum (PD), hourglass angle (HGA), and lateral shaft condylar angle (LSCA) measured on injury radiographs (XR), post-reduction XR, and at the first and final follow-up XR. **Results:** 77 elbows were treated with CR and long-arm cast or splint immobilization. 76.62% of elbows (59/77) maintained their reduction alignment and did not require surgical treatment for percutaneous pinning. The PD (Δ1.89 mm), HGA (Δ7.38 degrees), and LSCA (Δ5.07 degrees) had significant improvement following CR ($P <0.001$ for all). The use of conscious sedation during reduction was strongly associated with success, 83.05% (49/59) with sedation compared to 55.56% (10/18) success without sedation ($P= 0.025$). The LSCA measured upon presentation was 8.1 degrees less in those children requiring additional management ($P= 0.0140$). **Conclusions:** Improved and acceptable radiographic parameters were achieved by CR and immobilization in the majority of minimally displaced T2SCHFx. This study adds support for nonoperative CR under sedation with immobilization of selected T2SCHFx.

EVALUATING CHARACTERISTICS OF MEDICAL STUDENT AND ATTENDING VOLUNTEERS IN THE STUDENT-RUN CLINIC

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Background: The educational value of student-run free clinics (SRFCs) is being increasingly lauded, yet the rates of participation in our SRFC are unknown. Our objective is to evaluate characteristics of the population of medical student volunteers and faculty at the SRFC. **Methods:** Our target population is all of the UTRGV-SOM medical students and the faculty who have volunteered at the SRFC. Study design is a retrospective review of the sign-in sheets at the SRFC over the period that the SRFC has been open, greater than 12 months. We will analyze characteristics with chi-square test and 2 sample *t* tests for categorical and continuous variables, respectively. **Results**: We will collect per student their medical school year, gender and dates volunteered. We will analyze how many of each total class have ever volunteered. We will analyze the percentage of participants per medical school year. We will see patterns of repeat participation, to see if some students are participating at much higher rates than others. For faculty, we will analyze the total number of faculty who have volunteered, their frequency of volunteering and their specialty. **Conclusions:** Further research could include surveying the medical students to obtain more characteristics such as age, prior clinical work, burnout scores, and perceived benefits. As the years progress, correlation with performance in clinical years may be evaluated. Using the baseline characteristics obtained in this study can help with further curriculum development and grant funding for the UTRGV SOM SRFC to further serve the community and its students.

ASSESSING THE IMPACT OF A PUBLIC HEALTH COMPETITION ON ADOLESCENTS IN THE RIO GRANDE VALLEY

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Background: The Rio Grande Valley (RGV) has the highest poverty rates in Texas and residents of the RGV often face multiple barriers to care. This has led to multiple health disparities, including rising rates of diabetes and obesity as well as premature births. **Methods:** This study aimed to evaluate the use of a medical student-led public health competition program in educating adolescents on healthcare disparities through the use of a pre-test and post-test survey that assessed knowledge and awareness of the social determinants of health and their impact on healthcare disparities. Additionally, this study aimed to determine if participation in this type of program can impact the opinion of youth on choosing a career in STEM and public health fields. 39 adolescents from high schools in the Rio Grande Valley participated in this study. **Results**: There were no statistically significant results, which can be likely attributed to the small sample size, but there was a general trend of improvement between the pre-test and post-test survey results. Improvement was seen in questions assessing the public health factors that influence health as well as recognizing health consequences that arise from poverty. Participants also reported increased self-knowledge about health care disparities in the post-test survey and plans to pursue a career in a STEM and/or public health field. **Conclusions:** Based on these improvements, further research is needed but a public health competition may be useful in educating adolescents on healthcare disparities and empowering them to create community-driven solutions to improve the health of their communities.

A BIOPOLO FOR ACADEMIC MEDICAL CENTERS*: ITS GMP PLANT COMPONENT AS AN ESSENTIAL TOOL IN PHARMACOLOGICAL AND BIOTECHNOLOGICAL INNOVATION.*

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Purpose: The purpose is to describe the importance of a GMP plant in the development of innovative products for pharmaceutical and biotechnological industries, as well as a part of the academic health center to accelerate medical innovations. **Description**: The GMP plant is an experimental therapeutic agents production center that meets the good manufacturing practices (GMP) established by FDA guidelines. It guarantees the efficacy and the security of every biomaterial with therapeutic potential. **Lessons Learned:** There have been some attempts in EMCS in the development of stem cells clinical trials that have been put on hold by ethical committees because of the lack of a GMP plant. Our partners, the Methodist and the Mayo Clinic, both have GMP plants. They are at least 500 m^2 facilities that have isolated and independent clean production rooms that comply with ISO and FDA regulations. The Methodist produces notably RNAm- as well as nanotechnology-based experimental therapeutics, while the Mayo Clinic MSC-based experimental therapeutics. **Recommendations:** As part of the Biopolo, the GMP plant being planned for the health component of Tecnológico de Monterrey (TecSalud) represents the opportunity to participate in the promises of innovative cellular (MSC) and molecular therapies (gene, RNAm, and nanomedicines) to deliver the promise committed to the community it serves to deliver healthcare better than anybody else.

EFFECT OF PDGF-BB ON HUMAN RETINAL PERICYTES

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Background – The majority of ocular conditions seen in patients with diabetic retinopathy are a result of damage to the retinal vasculature, which leads to microaneurysms, hemorrhage, and eventually neovascularization. The first step in the pathogenesis of these conditions is derived from the loss of Human Retinal Pericytes (HRPs), or cells which are essential to the preservation of the integrity of the retinal vasculature. PDGF-BB is the primary promotor of growth and recruitment for HRPs. Levels of PDGF-BB vary throughout the progression from non-proliferative diabetic retinopathy (NPDR) to proliferative diabetic retinopathy (PDR), which may contribute to the early loss of HRPs. *Methods* – Three groups of HRPs were treated with three different concentrations of PDGF-BB which correlate to concentrations found in patients with PDR, NPDR, and normal conditions. After 24 and 48 hours the viable cells were counted by triptan blue measurements, and apoptosis was measure via a TUNEL assay. *Results* –Patients with NPDR produce lower levels of PDGF-BB than in normal conditions, which could contribute to the early loss of pericytes early in diabetic retinopathy. This is the first PDGF-BB study on its effect on the viability and longevity of HRPs. Data from in-vitro experiments are currently being collected and analyzed. *Conclusion*-Previous clinical trials on PDGF-BB inhibitors showed that they did not help patients with diabetic retinopathy due to the inherent deficiency of HRPs found in these patients. We anticipate results from this study will support an opposing approach by supplementing PDGF-BB, rather than blocking leading to innovative clinical outcomes.

PYRIDOXINE DEPENDENT EPILEPSY: PRENATAL ASSESSMENT OF PREVIOUS AFFECTED OFFSPRING.

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Background: Pyridoxine dependent epilepsy (PDE) is an autosomal recessive disorder due to a deficiency of α-aminoadipic semialdehyde (α-AASA) dehydrogenase which is encoded by the ALDH7A1 gene. Its deficiency results in accumulation of neurotoxic metabolites that are by products of lysine degradation. PDE is a treatable metabolic disorder. Therapy with pyridoxine/vitamin B6 supplementation, dietary lysine restriction and arginine supplementation has proven to decrease symptoms associated with ALDH7A1 mutations. If untreated, most PDE effected patients present with neonatal onset of seizure that does not respond to anticonvulsant therapy. **Case Study:** 31-year-old healthy woman, with unplanned pregnancy, gravida 3, para 2, referred for the early deaths of her two previous children. The first child died at two weeks-old and the second at ten-months-old, both with severe metabolic acidosis, encephalopathy and status epilepticus. None of them had abnormal MRI reported. First evaluation by Genetics was in this 3rd pregnancy, at ten weeks of gestation. **Results:** Both parents are carriers of ALDH7A1. The father has a pathogenic variant c.246+1G>A (splice donor), intron 2. Mother has a pathogenic variant c.518-1G>C (splice acceptor) intron 5. Neither of previous children have genetic test done. Parents declined prenatal molecular test for current pregnancy. Risk assessment for current pregnancy is 25%. Pregnancy has been uneventful. Mother is on pyridoxine supplement, it was started at 14-week- pregnancy, dose daily 100mg. **Conclusions:** PDE is a treatable disorder, early diagnosis and intervention are crucial for brain development and mortality reduction. Prenatal treatment with maternal pyridoxine supplementation might improve outcomes. Currently PDE is not detectable by newborn screening, but studies have shown evidence of stable metabolites that maybe be used as screening for PDE in the future.

ASSESSING THE IMPACT OF NON-RANDOM MATCHING IN SUPPORTING SUCCESSFUL TRANSITIONS TO MEDICAL SCHOOL: THE BIG SIB-LITTLE SIB PROGRAM

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Background: The transition into medical school can be stressful as students face changes in curricular structure and potential isolation from social support systems. Previous studies of the Big Sib-Little Sib peer-mentorship program found random matching presented limitations and potentially diminished the impact of the program. **Methods:** Two classes at UTRGV SOM were automatically enrolled into Big Sib-Little Sib upon matriculation. Fifty-five students from the Class of 2021 were randomly matched to 36 upperclassmen (16 1:1 pairs, 20 2:1 pairs) and 54 students from the Class of 2022 were matched with 39 upperclassmen (24 1:1 pairs, 15 2:1 pairs) based on desired characteristics such as sex, race/ethnicity, marital status, specialty interest, or hobbies. A feedback questionnaire was administered at least 6 months following notification of mentorship matches. A mixed-methods approach was used to gauge program impact and future directions. Statistical analyses were conducted in R 3.5.3. **Results:** Thirty-one students (56.4%) from the Class of 2021 and 39 students (72.2%) from the Class of 2022 completed the survey. The program was found to be more effective in supporting the transition to medical school for students matched preferentially based on desired characteristics compared to random matching (87% vs 64%, p=0.012). Mentor approachability and monthly in-person communication were identified as additional factors that facilitate effective peer-mentorships. **Conclusions:** Matching incoming students to

peer mentors based on desired characteristics strengthened the peer-mentorship connection and facilitated the transition into medical school. Future programs should focus on refining matching criteria and provide guidelines on effective strategies to mentors.

EPIDEMIOLOGY OF PEDIATRIC FIREARM INJURIES: HAVE WE IMPROVED IN THE PAST DECADE?

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Introduction: Firearm fatalities in the pediatric population continue to be at the center of a national crisis surrounding gun violence. We aim to explore a 10-year analysis of pediatric firearm injury epidemiology. **Methods:** A 10-year review (2007-2016) of the National Trauma Data Bank (NTDB) was conducted to identify pediatric injuries as a result of firearms. Pearson Chi Square tests were conducted to identify differences in temporal trends across various intents of injury. **Results:** 36,763 pediatric firearm-related injuries were identified in the NTDB. Blacks accounted for 39% of injuries whereas Hispanics and Whites accounted for 17% and 16%, respectively. Most pediatric firearm injuries were resultants of assault (n=24,388, 66%) while 23% were unintentional (n=8,629), and 5% were self-inflicted (n=1,830) ($p<0.05$). Roughly 1 in 4 pediatric patients were taken directly to the operating room whereas 1 in 6 were admitted directly to the ICU. 4% of patients died in the emergency department. Between 2007 and 2015, there was an 18% decline in assault-related firearm injuries. However, there was a 52% increase in unintentional firearm injuries during this same time period. Interestingly, 2016 saw a shift in these trends with a 7% increase and 22% decrease in assault and unintentional injuries, respectively. **Conclusion:** Inclusive gun control policies and a focus on primary prevention seem to play a role in the steady decline of assault-related injuries. The recent shift in assaults highlights the need for a unified probe into this national crisis to safeguard current and future generations of this vulnerable population.

TRAUMA AT THE BORDER: A DESCRIPTIVE ANALYSIS OF INJURIES AMONG UNITED STATES BORDER PATROL AGENTS

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Introduction: The responsibility of defending the southern United States border belongs to a multitude of agencies-largely defined as 'Border Patrol Agents'. Given the paucity of data regarding injuries sustained by border patrol agents, we sought to identify and characterize injuries sustained by border patrol agents using a national dataset. **Methods:** The U.S. Department of Labor's Federal Employee's Notice of Traumatic Injury and Claim for Continuation of Pay/Compensation dataset (CA-1 form) was queried from 2015-2017 to identify injuries, including mechanism of injury and location of injury. **Results:** During this 3-year period, 10,556 reported Border Patrol Agent injuries were identified. The highest number of injuries occurred in the states of Texas (47%), Arizona (23%), California (19%), New Mexico (8%) and Washington (2%). Most individuals suffered a musculoskeletal related injury. Specifically, a high preponderance of general injuries such as muscle strains and ligament sprains occurred secondary to slips and falls. 6,495 (61.5%) of injuries were resultant from trauma; 386 (3.66%) injuries were violence related. The mechanisms of these injuries are variably stratified with a large percentage coming from slips and falls, animals and insects, and vehicle accidents with the majority recorded as unknown mechanism. **Conclusion:** Border Patrol Agents along the U.S.-Mexico border sustain a variety of reported injuries ranging from muscle strains, lacerations, puncture wounds and fractures. Injuries derived from violence made up a minority of the injuries recorded. Further studies are vital in order to understand and subsequently provide optimal care for our country's border patrol agents.

RACIAL INEQUALITY IN TRAUMA: A DISPROPORTIONATE RISE IN THE ASSAULT OF MINORITY WOMEN

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Introduction: Traditionally, the health needs of women have lacked in medical research. Given the paucity of data available regarding race and trauma in women, we aimed to evaluate traumas incurred by women and analyze temporal racial differences. **Methods:** A 5-year review (2007-2011) of the National Trauma Data Bank was conducted to identify common mechanisms of injuries in women. Bivariate analyses were performed to identify differences in temporal trends amongst racial groups. **Results:** 538,505 women presented secondary to a trauma. Most presented due to an unintentional mechanism (92%) while fewer presented secondary to an assault (7%), self-inflicted injury (1%), or other mechanism (<1%). White women incurred 40% of traumas while Black and Hispanic women each represented 5.5%. Although Black and Hispanic women represented a small percentage of total traumas, they accounted for 23% and 11%, respectively, of all assault-related traumas. Compared to White women, firearm-associated assault was 2.3 times more prevalent among Black women ($p<0.001$). Though assaults decreased by 29% during this study period, Black and Hispanic women saw a 133% and 50% increase, respectively, in total assaults. Furthermore, Black and Hispanic women saw a 132% and 34% increase, respectively, in firearm-associated assaults.

Conclusion: In this study, significant racial differences were noted in female trauma patients thus highlighting the disproportionate rise in total assault and firearm-related assault traumas during this study period. Further studies are essential to help understand and subsequently provide social and preventative services for the diverse population of women in the United States.

KNOWLEDGE OF THE POPULATION REGARDING THE DAMAGE TO HEALTH BY OBESITY IN ADULTS

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Background: Obesity is a disease that is reflected by the weight gain caused by excessive accumulation of fatty tissue, consequence of the imbalance between ingested energy and it's expenditure. In Mexico, there is few scientific evidence about the population's perception of it's nutritional status and it's possibility of developing obesity and was considered to analyze the perception of the population of 20 to 59 years about the health damage that obesity entails in order to identify possible risk factors. **Methodology:** Study Design: Observational descriptive type of cross section. Study site: Fraccionamiento Praderas, Cd. Victoria, Tamaulipas, México.
Material: Survey "Perception of the population regarding the damage to health by obesity in adults of 20 to 59 years" of ENSANUT. Sample: 60 surveys. **Results**: Based on knowledge scores, food practice and healthy lifestyle: 71.6% has a high knowledge of obesity damage to health, but only 16.6% practice a healthy lifestyle. **Conclusions**: Despite the fact the highest percentage of respondents obtained a high score of knowledge the health risks of obesity, it was observed that only a small percentage practices a healthy lif estyle. This may indicate that there are other factors that could prevent a healthy lifestyle and food practice.

CORRELATION OF SHORT-TERM MEMORY AND OBESITY IN ADULT WOMEN

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Background: Memory is a central element for the human being, which processes and stores information that will be used throughout life. This information can be retrieved, voluntarily and consciously and others involuntarily. The short-term memory MCP is all limited retention which is affected with the passage of age, since the retention of information is not the same. Obesity is defined as the increase in body weight associated with an imbalance in the proportions of the different components of the body, in which fat mass increases with an abnormal body distribution. The aim of this study was analyze the association between short-term memory capacity and overweight u obesity in adult women of Victoria City, Tamaulipas. Methods: A survey was carried out asking for different personal information such as the name, age, weight and mental illnesses of the person or a relative of the person. The correlation between obesity in adult women and short term memory was 0.0013. However, it was found that women who practice a profession obtained 50.46% in memory of 100% which is good compared to women who are housewives who represent one who obtained a 31.8% of memory, which is less. Conclusions: In this study, no significant correlation was found, however, it was found that in the people surveyed who have a profession, short-term memory is prevalent.

EVALUATION OF THE QUALITY OF THE CAMPAIGN "CHÉCATE, MÍDETE, MUÉVETE

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Background: Mexico ranks second in obesity with a prevalence of 32.4%, which is alarming because it can trigger chronic noncommunicable diseases. The campaign was focused on promoting healthy lifestyles, however,the established goals were not achieved. The main of this study was estimate the quality of the "Chécate, Mídete, Muévete" program, through the knowledge that people have about the campaign. Methods: The ENSANUT 2016 survey and a study population of 80 people were used, two populations of different socioeconomic level were evaluated. Results: According to the results obtained, students from the Universidad Autónoma de Tamaulipas (UAT) obtained 40% knowledge compared to 35% from La Salle Victoria University (ULSA). It was also found that 77.5% of the population of the ULSA and 67.5% of the UAT did not receive information about the campaign. Conclusion: It was found that this type of campaign had a useful initiative, however, they were not given enough information, nor personalized attention for which they did not finish with the expected goal.

RESEARCH ON PREVENTION OF DIABETES MELLITUS TYPE 2, BASED ON FINDRISC SCALE.

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Background: Diabetes type 2 is one of the illnesses with the highest prevalence in Mexico, the healthcare system spends billions of pesos in the treatment. The evolution on a patient without the proper care can cause multiple complications that become irreversible. Prevention is key in the improvement of the population's health and the good administration of resources that can be used in other areas. Methods: The investigation consisted of sixty people surveyed with the FINDRISC scale. There was one excluding criteria, having diabetes type 1 or 2. The criteria of inclusion consisted of being

eighteen years older at least. Results: the sixty people that were able to be surveyed 8% of them had a very high risk of developing diabetes, 10% had a high risk, 21% had a moderate risk, 41% had a low risk and 5% had a very low risk. Conclusion: Based on the results more strategies on the prevention of the disease should be implemented to help to diminish the prevalence of the diabetes type 2 in the Mexican population.

THE EFFECTS OF POVERTY ON HEALTH BY GENDER: A SAMPLE OF 2018 OPERATION LONE STAR PARTICIPANTS

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Background: While 15% of the U.S. population live in poverty, the corresponding rate for Hidalgo County is more than double the national rate (32%). The association between poverty and poor health is well documented. However, few studies explore this association by gender, especially among Hispanics. The purpose of this study is to examine the relationship between poverty and health by gender in a vulnerable Hispanic community. **Methods:** We used a cross-sectional research design and in-person interviews to collect data from 327 participants at Operation Lone Star, a health emergency preparedness exercise along the Texas-Mexico border. Health measures included self-rated health status, number of days of poor physical health in the past 30 days, and previous diagnosis of chronic diseases. Univariate and multivariate analyses were used to examine associations between income and health. **Results:** Nineteen percent of participants were male, and 38% reported incomes<$10K (U.S.-6.7%). The average number of days of poor physical health was 5.4 (Hidalgo County-4.4; Texas-3.6), and 42% reported fair/poor health (Hidalgo County-32%; Texas-18%). Binary logistic models revealed males earning <$10K were significantly more likely to report fair/poor health (Odds ratio (OR):10.177; 95% Confidence Interval (CI):1.853-55.886) relative to those earning $10K or more. No significant associations were observed for the female subsample. **Conclusions:** Our findings highlight that the cultural/social construct of gender roles in Hispanic communities may play an important role when examining the health of Hispanic males living in poverty. Machismo values, or beliefs about masculinity, may be a contributing factor to poor health among this group.

FOOD INSECURITY SCREENING IN THE RIO GRANDE VALLEY: A SURVEY OF PEDIATRICIAN ATTITUDES AND PRACTICES

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Background: The American Academy of Pediatrics recommends that all pediatricians screen for food insecurity (FI). Although studies have evaluated clinician FI screening practices, no study to date evaluates pediatrician screening practices within the Rio Grande Valley (RGV) of Texas. Given the higher rates of pediatric food insecurity in the RGV, our study aims to assess the prevalence, frequency, and barriers of FI screening among pediatricians practicing in the RGV. **Methods**: Our study employs an electronic Qualtrics survey to gather data about the behaviors and perceptions of pediatricians in the four-county region (Hidalgo, Cameron, Starr, and Willacy) of the RGV. The inclusion criteria requires all pediatricians to practice in one of the four counties listed above, and does not exclude physicians based on pediatric subspecialties. Descriptive statistics and Pearson Chi-square analysis will be used to analyze food insecurity screening prevalence and frequency data. **Results**: We plan on collecting data from August 2019 through September 2019. We hypothesize that FI screening prevalence will be higher in the RGV than the national average. Given conclusions made by previous studies, we expect that a major barrier of pediatrician FI screening is the inability to provide adequate resources for patients who screen positive. **Conclusions:** By determining provider practices related to FI screening, we can use organized medicine to develop training programs that aim to educate physicians on FI and the role it plays in pediatric care. Ultimately, our study aims to facilitate partnerships with healthcare providers, clinics, and local food resources in the RGV.

OBSERVING GROWTH EFFECTS OF PIGMENT EPITHELIUM-DERIVED FACTOR ON HUMAN RETINAL PERICYTES IN VITRO

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Background: Diabetic retinopathy (DR) is one of the major leading causes of blindness in the world, yet the specific initial insult leading to the pathogenesis is unknown. The aim of this project is to corroborate and determine the role of PEDF in beginning the transformation of DR from its non-proliferative (NPDR) to proliferative (PDR) stages. **Methods:** Human retinal pericytes (HRPs) were isolated and seeded in 24-well plates in triplicate. PEDF was added to the cultures in varying concentrations of 5, 50, and 500 ng/mg. The effect of PEDF alone and with the addition of advanced glycation end-products (AGEs) on cell proliferation was determined by Thermo Fisher cell counting software and evaluated for comparison. Measures of apoptotic activity was determined with TUNEL assays. **Results**: Results are pending in lab. Expected outcomes are to show increasing levels of HRPs and/or reduced apoptotic activity correlating with higher concentrations of PEDF. **Conclusions:** These results may serve to suggest that decreasing levels of PEDF facilitates the advancement of NPDR to PDR. Further studies are warranted to outline and target the exact cell signaling pathway involving PEDF in progression of the disease. Targeting this sequence may help to determine when supplementation of PEDF may be of benefit in NPDR patients. This data may be used to create a more targeted, synergistic approach for the treatment and prevention of PDR.

FUNCTIONAL AND TRANSCRIPTOMIC PROFILES OF IPSC GENERATED MATURE HEPATOCYTES

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Background: Nonalcoholic fatty liver disease (NAFLD/steatosis) is a major determinant of hepatocellular carcinoma (HCC) risk. Hispanics in south Texas exhibit one of the highest incidences of hepatocellular carcinoma. Because HCC is relatively rare (compared with common diseases) and has a low survival rate, it is difficult to directly study the underlying causes of risk in patients. Mature functional hepatocytes (HEPs) differentiated from patient derived induced pluripotent stem cells (iPSCs) hold high promise for NAFLD *in-vitro* modelling. **Methods:** Using deidentified, validated iPSC lines established from 2 participants of our San Antonio Mexican American Family Study, functional HEPs were generated and genome wide RNA sequencing performed to better understand their functional characteristics and disease modeling potential. **Results:** The generated hepatocytes expressed several hepatic markers (AFP, ALB, E-Cad, Actin and HNF4α). A total of 7,268 genes were significantly differentially expressed (moderated *t* statistics FDR corrected *p*-value ≤0.05, fold-change absolute ≥2.0) between iPSCs and differentiated HEPs. The 3,879 genes significantly upregulated in HEPs showed high enrichment in FXR/RXR activation (52.4% overlap; *p*-value $3.56x10^{-21}$), LXR/RXR activation (48.8% overlap; *p*-value $3.77x10^{-17}$) and hepatic fibrosis/hepatic stellate cell activation (37.6% overlap; *p*-value $6.32x10^{-13}$) canonical pathways. Farnesoid X receptor (FXR) controls numerous metabolic pathways and is activated by bile acid. Liver X receptor (LXR) is activated by oxysterol ligands and LXR/RXR complex is involved in regulation of lipid metabolism, inflammation and cholesterol to bile acid catabolism in the liver. **Conclusions:** These results strongly support the potential utility of iPSC generated HEPs in *in-vitro* modeling of NAFLD/liver steatosis.

POSTER PRESENTATION ABSTRACTS

Post-Doctoral Category

MULTIPLE REACTION MONITORING MASS SPECTROMETRY EVIDENCE FOR HUMAN MUTANT ALLELE HAPLOINSUFFICIENCY IN HYPERTROPHIC CARDIOMYOPATHY MYOCARDIUM WITH MYBP-C TRUNCATION

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Background: *MYBPC3* gene mutations are responsible of ~40% of the cases of Familial hypertrophic cardiomyopathy (HCM). The clinical spectrum is highly influenced by the type of mutation found which can determine the fate of the protein (incorporation or haploinsufficiency). Unfortunately, this fate cannot be determined by conventional genotyping studies, and new tools are required to determine its clinical relevance. In the present study we obtained myocardial samples from patients with HCM secondary to *MYBPC3 tuncations* and quantified the levels of MyBP-C N-term and C-term peptides in the whole heart tissue homogenates. Methods: We used septal myomectomy specimens from seven genotyped HCM patients and four control hearts. Myocardial proteome weas preserved using tissue stabilizer T1 and stored at -80°C. A western-blot with Anti-MyBP-C C0C1 antibodies was made with protein extracted from the tissue samples, and quantified by densitometry. The abundance of MyBP-C was made using Absolute quantification (AQUA) and multiple reaction monitoring (MRM) mass spectrometry. The sequence of the peptides was predicted *in-silico* using Skyline software and optimized experimentally. The statistical analysis was made using R software. Results: The western-blot revealed as statistically significant decrease in MyBP-C of 37.9% ± 8.3% ($p<0.05$). The MRM displayed a decrease of 38% and 47% in N-Term and C-Term peptides respectively ($p<0.01$). Conclusion: These results support the hypothesis that a variable degree of MyBP-C protein haploinsufficiency could be the main mechanism for *MYBPC3* mutations pathogenesis. Other studies with similar mutations have also supported the presence of haploinsufficiency in tissue samples.

EFFECT OF FATALISM AND RELIGIOSITY ACROSS THE LIFESPAN ON PHYSICAL ACTIVITY AND NUTRITION BEHAVIOR AMONG MEXICAN-AMERICAN PATIENTS OF A TYPE 2 DIABETES CHRONIC DISEASE MANAGEMENT PROGRAM

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Background: Socioeconomic and cultural factors, including religiosity and fatalism, play a role in type 2 diabetes (T2D) management among Hispanic adults. Purpose of study is to determine the relationship between fatalism and lifetime religiosity with two T2D management behaviors: physical activity (PA) and healthy eating.

Methods: Cross-sectional study employed a convenience sample of adult Mexican-American participants (n=345) enrolled in a T2D chronic care management program, Salud y Vida, in the Rio Grande Valley. At baseline, participants were administered the Diabetes Fatalism Scale, assessing emotional distress, religious and spiritual coping, and perceived self-efficacy. Sub-scale of the National Comorbidity Study-Replication measured lifetime

religiosity. T-tests and chi-square tests assessed the relationship between diabetes fatalism and religiosity and meeting PA and nutrition recommendations, respectively. A logistic regression model further examined significant relationships while controlling for gender, age, and education. **Results**: A significant difference in emotional distress scores was noted between those meeting fruit and vegetable recommendations (M=2.25, SD=0.10) versus those not meeting recommendations (M=2.78, SD=0.26); t(1.96), p=0.05. The proportion of participants meeting nutrition recommendations reporting that religiosity was important during childhood (0.18) was significantly higher than those who reported religiosity was not important (0.07); x^2=4.87,p=0.03. Logistic regression model revealed both emotional distress and childhood religiosity were significant predictors of nutrition behavior after controlling for potential confounders. **Conclusions:** Findings suggest fatalism and religiosity play a role in nutrition behavior but not PA behavior. Further longitudinal research is needed to examine this relationship to observe changes in behaviors in response to a chronic disease management program.

A REVIEW OF THE DISABILITY ACCOMMODATIONS PRACTICES OF THE MEDICAL COLLEGE ADMISSIONS TEST

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Background: The proportion of American medical students with disabilities is drastically low compared to the general population. This study seeks to examine the compliance of the practices utilized by the Association of American Medical Colleges for reviewing requests for disability accommodations for the Medical College Admissions Test (MCAT) with established federal disability rights law. **Methods:** The MCAT's disability accommodations application process was examined across three categories of disability: learning disabilities, ADHD, and/or psychiatric disabilities, sensory disabilities, and physical disabilities. Within each category, the AAMC polices relating to required documentation, medical evaluation, and evaluation timeframe where compared to the ADA guidelines for accommodated testing. Each policy was rated as "compliant" or "non-compliant". **Results**: Of the nine policy areas examined, only five (56%) where compliant with federal disability rights law. **Conclusions:** The AAMC's disability accommodations policies for the MCAT exam do not meet federal standards and pose a significant potential burden and/or disadvantage for prospective medical students with disabilities. A key factor in closing healthcare disparities for minority groups is ensuring their adequate representation in the medical field. The AAMC should consider how its policies may negatively affect disability representation in the medical field, both for the sake of educational equity and as a necessary first step towards ending the persistent healthcare disparities faced by disabled patient populations.

EARLY DETECTION OF LIVER ABNORMALITIES IN ADOLESCENTS AND YOUTH FROM TAMAULIPAS, MEXICO.

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(School of Public Health, Brownsville Regional Campus. The University of Texas Health Science Center at Houston. School of Medicine. Edinburg Regional Campus. The University of Texas Rio Grande Valley. Maestría en Salud Pública. Universidad México Americana del Norte. A.C. Unidad Académica Multidisciplinaria Reynosa-Aztlán. Universidad Autónoma de Tamaulipas.)

Background: Liver fibrosis can be detected decades before progression to cirrhosis; therefore, assessing liver fibrosis in young population can help to establish the prognosis of liver disease. The objective of this study was to assess early liver damage detected by transitional elastography [estimate of the hepatic elasticity related to the degree of fibrosis: the lower elasticity, the greater fibrosis] in freshman university students from Reynosa, Tamaulipas-Mexico.
Methods: Our validated Cardiometabolic Risk Assessment Questionnaire and the Alcohol Use Disorders Identification Test were used for risk-stratification from 500 freshmen to select 200 individuals (low vs. high risk) who

underwent elastography (stiffness-aPk and controlled attenuation parameter-dB/m [CAP]), using FibroScan® 530 Compact (SN:F80254)-Probe XL (SN:92484) -G3.2. Data analyses were performed using multiple regression technique after adjusting age and sex influences on body mass index (BMI) and alcohol consumption level (ACL). **Results:** Data were available from 198 individuals for analysis: Females=60%, mean age=18.5y [SD 1.5], obese=27%, mean stiffness=4.9 [SD 1.1] aPk, mean CAP=255 [SD 59] dB/m. ACL was found in 54% and smoking in 19% of the individuals. Partial correlations to explain stiffness on BMI were 0.33 ($p<0.001$), and ACL -0.001 ($p=0.9$), and to explain CAP on BMI were 0.7 ($p<0.001$) and ACL was -0.1 ($p=0.14$). **Conclusions:** These data provide evidence that the liver abnormalities were mainly associated with obesity despite half of this young population was consuming alcohol. The future follow-up of this cohort should help us delineate the temporal effects of each of these two factors on potential liver dysfunction measures by elastography.

DEVELOPMENT AND EVALUATION OF POLYCLONAL AND MONOCLONAL ANTIBODIES AGAINST RWB FOR THE DETECTION OF CIRCULATING FILARIAL ANTIGENS

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Background: Lymphatic filariasis (LF) is endemic in tropical/subtropical regions of the world; *Wuchereria bancrofti* (Wb) is the main etiological agent. The Global Program to Eliminate LF (GPELF) was created in 2000 and is expected to complete its work by 2020. POC-ICT and Og4C3 ELISA are currently the only available antigen capture assays despite the fact that these antigens are derived from species other than Wb. Therefore, the main goal of this study was to develop and evaluate monoclonal and polyclonal antibodies against rWb for the purpose of detecting circulating filarial antigens with high levels of specificity and sensitivity. **Methods:** The antigen rWb was expressed in *E. coli* BL21 and purified by chromatography. Then, monoclonal and polyclonal antibodies were developed in mice and rabbits, respectively; and an ELISA-based capture assay was developed and evaluated. **Results**: The purified rWb was confirmed by SDS-PAGE. Two stable hybridoma clones were selected, and designated mAbs X and Y. Both of them were identified to belong to the IgG1 subclass. The polyclonal antibodies also were able to recognize the antigen. To perform sandwich ELISA, the better combination for recognizing rWb was using the polyclonal antibodies for capture and the X mAB for detection. **Conclusions:** The rWb capture ELISA is highly sensitive in recognizing the recombinant antigen, but it needs to be tested with serological samples from infected people to establish it as a viable option for LF diagnosis and to enable it to contribute to the goals of GPELF.

RATIONAL SYNTHETIC BIOLOGY APPROACH TO DEVELOP FASTER AND ACCURATE ANTIGENS FOR VACCINES DESIGNED AGAINST INFLUENZA AND SCFV ANTIBODIES AGAINST EBOLA

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Background: While technological advances of recent years have been revolutionizing the life sciences industry, specifically for Monoclonal Antibodies used on chronic diseases (i.e. autoimmune or orphan), these advances have been disproportional in terms of their applications towards infectious diseases. Production of recombinant vaccines have failed to provide a systematic vision that merges state-of-the-art technologies with industry to provide an effective commercial solution. Infectious and rapidly transmitted diseases, such as Cancer, Ebola and Influenza, should be a focus of interest for these prospects. **Methods:** Hemagglutinin antigens from Influenza and ScFv antibodies against Ebola had been developed in our lab, through a process of molecular engineering, which begins with in silico bioinformatic processes, using codon optimization, validations and algorithms, subsequently through synthetic biology, molecular biology, genetic engineering, and BioProcess development, efforts towards 140L pilot plant levels. **Results**:. Expressed proteins showed biological antibodies (HA-RBD) and antigen (ScFv-13F6 and ScFv-13C6) recognition, recognizing specific in-sillico designed

epitopes, and yields up to 120 mg L-1. **Conclusions:** The primary goal is the development of integrated solutions that can be used mainly as vaccines but as well as treatments and diagnostic systems. Working on the development platforms using recombinant technology is needed for the production of chimeric proteins using low cost scalable systems as yeast and bacterial cells genetic modified for those purposes.

NOVEL NANOPARTICLE FORMULATION OF VERU 111 FOR PANCREATIC CANCER THERAPY

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Background: Pancreatic cancer (PanCa) is one of the leading causes of cancer-related mortality in the United States due to very limited therapeutic options. Thus, developing novel therapeutic strategies will help for the management of this disease. We recently identified VERU-111, a novel synthetic molecule which showed potent anti-cancer effect against PanCa *via* targeting clinically important βIII and βIV tubulin isoforms. In this study, we synthesized and characterized its novel nanoformulations (MNP-VERU) and evaluated its therapeutic effects *in vitro* and xenograft mouse model.
Methods: MNPs were prepared by chemical precipitation method and loaded with VERU-111 using diffusion method. This formulation was characterized for particle size, chemical composition, and drug loading efficiency, using various physico-chemical methods (TEM, FT-IR, DSC, TGA, and HPLC). The internalization of MNP-VERU was achieved after 6 hours incubation with MNP-VERU in PanCa cells. To determine therapeutic efficacy of MNP-VERU, we performed various *in vitro* (MTS, wound healing, Boyden chamber real-time xCELLigence, and apoptosis assays) and *in vivo* (mouse tumor xenograft) studies using PanCa. Effect of MNP-VERU on various key oncogenic signaling pathways, and miRNAs was evaluated by Western blot, immunohistochemistry (IHC), confocal microscopy, qRT-PCR and *in situ hybridization* (ISH) analyses respectively. **Result:** Our novel MNP-VERU formulation provided average size of 110 nm in dynamic light scattering (DLS) and exhibited -8.23 to -11.65 mV zeta potential with an outstanding loading efficiency (94%). Cellular uptake and internalization studies demonstrate that MNP-VERU escape lysosomal degradation, providing efficient endosomal release to cytosol. MNP-VERU showed remarkable anti-cancer potential in various PanCa cells (Panc-1, AsPC-1, HPAF-II, BxPC-3, MiaPaca) and more effectively repressed βIII and βIV tubulin isoforms *via* restoring the expression of miR-200c. MNP-VERU more effectively suppressed AsPC-1 cells derived xenograft tumors in athymic nude mice.
Conclusions: Taken together, our results suggest that MNP-VERU has more anti-cancer potential than free VERU-111 against PanCa. MNP-VERU may reduce the toxicity and improve the bioavailability of free VERU-111 and could be used for the management of PanCa.

POSTER PRESENTATION ABSTRACTS

Resident Category

USE OF BLOOD GLUCOSE LOGS IN PATIENTS WITH TYPE 2 DIABETES ON INSULIN IN RESIDENTS INTERNAL MEDICINE GME CLINIC

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Background: Diabetes mellitus has increased to epidemic proportions in recent years. Multiple studies have documented the importance of glycemic control to delay the onset and decreasing the incidence of the complications of diabetes. A multidisciplinary team of health care professionals can decrease the morbidity and mortality of patients suffering of diabetes mellitus. The study objectives include to improve the use of glucose log in patients on insulin. Other objectives include improve physician-patient communication and feedback on diabetes management and empower patients to play an active role in their diabetes management. **Methods:** This Quality Improvement project took place at a internal medicine clinic. The proposed sample population is our internal medicine GME clinic patients with Diabetes Mellitus (type 2) between the ages of 18 and 65 who were currently on insulin. This experimental study had four main interventions: First provide glucose monitoring log sheet and education to every patient on insulin and then reinforce use of log sheet every visit while educating the patient on insulin use (administration techniques, frequency, storage, complications) every visit. The physician will then adjust insulin requirements according to log sheet and A1C measurements. **Results**: Results are being analyzed to determine: 1) Description of baseline information (mean age, proportions of different sex, race, and ethnic groups) 2) Paired sample t-test comparing the difference between first-visit A1c and last-visit A1c and possibly 3) Linear regression to test the relationship between the mean change of A1c and the times of visit. Results will also include barriers encountered while translating evidence to practice.
Conclusions: To be determined.

TRAJECTORY OF GESTATIONAL DIABETES MELLITUS AND ASSOCIATED CHARACTERISTICS IN THE HISPANIC POPULATION

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Background: Women with a history of Gestational Diabetes Mellitus (GDM) have an increased risk of developing type 2 Diabetes Mellitus (DM) later in life. There is paucity of literature, specifically related to GDM in Hispanic women. We sought to examine the characteristics associated and also the trajectory of the disease. **Methods:** Data from the medical records of all pregnant women diagnosed with GDM; presenting to the DHR Hospital in Edinburg, Texas between November 2006 and November 2018 were examined. Descriptive data were obtained, and associations were tested using chi-square and ANOVA tests in SPSS. **Results**: 5412 women were diagnosed with GDM within the study period with a mean age of 34 years ± 6.5. 97% identified as Hispanic and only 3% of patients had a history of GDM in prior pregnancies. Our results did show a statistically significant relationship between age and GDM diagnosis with women between 31-45 years being more diagnosed with GDM on the average per month compared with the other groups ($F_{2,390}$=168.4, p=0.00). We also found a significant increased trend in the incidence of GDM diagnosis across the years, especially in women who identified as Hispanic. Data analysis of our study did not reveal a significant relationship between GDM in index pregnancy and previously documented associations such as obesity status, race/ethnicity and history of

GDM. **Conclusions:** The findings from our study may be important in health policy making as specific policies can potentially be made to target specific groups in an attempt to curb the growing menace of DM.

SPHINCTEROTOMY FOLLOW UP INTERVAL: DIAGNOSING FECAL INCONTINENCE

Resident: David Eckelbarger, MD
Faculty: Alberto Pena, MD, School of Medicine, University of Texas Rio Grande Valley.

Background: Fecal incontinence remains a complication of sphincterotomy that has tremendous impact on patients. The operation itself is a treatment for anal fissures but can also have serious complications. The ideal follow up interval postoperatively to diagnose most cases of incontinence has not been established in the current literature, with lack of significant patient population in most studies being a pitfall. Methods: This institutional retrospective study examines the post op fecal incontinence rates at DHR after sphincterotomy performed by a colorectal surgeon in several hundred patients over the past decade. The time to diagnosis of this complication in the post op follow up period was examined. Results: A 3 month follow up interval from the initial sphincterotomy was adequate to properly diagnose a majority of patients suffering fecal incontinence post-operatively, with further follow up intervals not yielding significant benefit to the patient. Conclusions: After sphincterotomy, a follow up clinic visit interval of 3 months is adequate to properly diagnose and facilitate management of fecal incontinence in a strong majority of patients.

VAGUS NERVE STIMULATION (VNS) VS. DEEP BRAIN STIMULATION (DBS) TREATMENT FOR MAJOR DEPRESSIVE DISORDER AND BIPOLAR DEPRESSION: A COMPARATIVE META-ANALYTIC REVIEW

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Background: Patients who suffer from major depressive episodes and bipolar disorder often exhibit pharmaco-resistance. Therefore, novel treatment methodologies are being proposed to treat the disease or provide symptomatic relief. VNS and DBS are two such techniques, both of which utilize neurostimulation to achieve therapeutic relief. However, it is necessary to establish the comparative efficacies of these methods in treating MDD in patients. **Methods:** We conducted a meta-analysis of studies of the subject. Twenty-six studies were selected, consisting of 1160 patients who were treated with either VNS (Mean age = 47.75 years old, mean duration of illness = 22.86 years) or DBS (Mean age = 33.11 years old, mean duration of illness = 9.9 years) treatment arms and analyzed them to determine the amount of improvement in mood. **Results:** A comparison of the summary effect size produced by VNS (HDRS = 1.247, MADRS = 1.110) to that produced by DBS (HDRS = 2.063, MADRS = 1.996) seems to demonstrate that DBS is the more effective treatment. The effect size for VNS was lower than that of DBS groups, indicating that DBS is more effective than VNS. **Conclusion:** Current meta-analysis demonstrates that Deep Brain Stimulation (DBS) is a better treatment modality for Major Depressive Disorder and Bipolar Depression than Vagus Nerve Stimulation (VNS). However, as the VNS and DBS groups differed concerning the clinical profiles of the patients (both in terms of age and regarding the duration of the illness.

BMI effects on pathologic response after neoadjuvant chemoradiation therapy for locally advanced rectal cancer in the Hispanic population

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Purpose: Analyze the pathologic response of neoadjuvant chemoradiation in relation to BMI in the Hispanic population, specifically the Rio Grande Valley. **Methods: R**etrospective chart review of patients age 18 or older who underwent neoadjuvant chemoradiation for mid-low rectal cancer followed by an oncologic resection. We analyzed 83 Hispanic patients using descriptive statistics and logistic regression. **Results:** In our study population of 83 patients we found 18 subjects with complete response to treatment (22%) and 65 with a non-response (78%). Our initial comparison was between normal weight (BMI $\leq$ 24.9), overweight (BMI $\geq$ 25-29.9) and obese ($\geq$ BMI 30). The OR for obese and non-response was 3.6 (95% CI: 0.94, 13.5; p=0.052). **Conclusions:** Our study was consistent with current data on the negative effect that obesity has on the response to neoadjuvant chemotherapy in the treatment of mid-low rectal cancers. Our data was significant in the fact that obese individuals have a 3.6 times higher risk of non-response compared to patients with a BMI $\leq$ 29.9. Most studies showed an OR of ~ 1.6 and given our high OR of 3.6 this encourages the need for further investigation to assess if the Hispanic population is at higher risk of non-response.

CLEARING CERVICAL SPINE COLLARS IN OBTUNDED PATIENTS AND PATIENTS WITH DISTRACTING INJURIES

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Background: The use of cervical collars in trauma patients has been the mainstay restriction of cervical movement for over 30 years with strict guidelines for clearance. However, recent literature shows benefits of early removal of cervical spine collars in trauma patients who are obtunded or have a distracting injury. **Methods:** With this quality improvement project, a new protocol will be proposed for early clearance of cervical spine collars in trauma patients who are obtunded or have distracting injuries using CT imaging only. **Results:** We expect that with the shortened use of cervical collars, there will be decreased anxiety in trauma patients, less pressure ulcer development, and less cervical collar induced increased intracerebral pressure. **Conclusion:** The new protocol will lead to less adverse effects from prolonged cervical collar use.

A REVISED PROTOCOL FOR CERVICAL SPINE IMMOBILIZATION & CLEARANCE

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Background: In the multisystem blunt trauma patient, immobilization of the cervical spine remains one of the most critical steps in early evaluation and treatment. While the incidence of cervical spine injuries remains low (1-3%) in trauma patients overall, missing a clinically significant cervical spine injury can have devastating consequences. Cervical spine protocols exist universally in most hospitals for this reason, however their basis on current best practice guidelines and literature varies considerably. The purpose of this project is to develop evidence-based guidelines for cervical spine immobilization, with a safe and accurate protocol for the subsequent clearance of the cervical spine. **Methods:** An extensive literature review will seek to establish the most current evidence and recommendations regarding cervical spine immobilization and clearance as they relate to the blunt trauma patient. This information will then be used to create a standardized protocol for cervical spine immobilization and clearance in blunt trauma patients. Feedback will be elicited from trauma surgery, emergency medicine, neurosurgery, and radiology departments to ensure adherence to standards of care. **Results:** With a careful review of the literature we hope to establish an effective evidence-based protocol for cervical spine immobilization and clearance in blunt trauma patients. This algorithm would be easily accessible and seek to replace the current clinical practice guidelines currently in place at Doctors Hospital at Renaissance. **Conclusions:** With

the implementation of a standardized protocol we hope to improve the quality of patient care, direct decision-making in the placement and removal of cervical spine collars, and decrease the missed diagnosis of clinically significant cervical spine injuries in blunt trauma patients.

EXAMINING THE ASSOCIATION BETWEEN DEPRESSIVE SYMPTOMS AND WEIGHT LOSS AMONG HISPANICS WITH UNCONTROLLED DIABETES ENROLLED IN A 12-MONTH LONG LIFESTYLE INTERVENTION PROGRAM

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OBJECTIVE: Studies investigating the association between depression and weight changes during participation in programs aimed at controlling type-2 diabetes are sparse and have yielded mixed results. This study was designed to determine whether depressive symptoms at baseline would affect weight loss over a 12-month period for participants in a chronic care management Program, Salud y Vida. **RESEARCH DESIGN AND METHODS:** Participants in this program are volunteers who commit to a structured multi-disciplinary program designed to promote improvement in their diabetes and overall health status, aiming towards decreased acute care over time. 358 adults with uncontrolled type-2 diabetes were subdivided into the following categories based on initial PHQ-9 scores: no or minimal depression (0-4), mild depression (5-9), moderate depression (10-14), moderately severe depression (15-19) and severe depression (≥20). Demographic information collected included age, gender, preferred language, body mass index (kg/m^2) and education level. Body mass index was categorized as Underweight/Normal, Overweight and Obese. ANOVA was used to determine if the mean percent weight change after 12 months differed among levels of depressive symptoms at baseline (α=0.05). Chi-square analysis was used to examine the association between BMI at baseline and depressive symptoms. **RESULTS:** Most of the study population was over 50 years old (63%), female (75%), and Spanish speakers (75%). In addition, the majority of Salud y Vida participants were experiencing moderate to severe depression at baseline. On average, participants did not lose weight between baseline and 12 months. ANOVA results confirmed that this was the case regardless of severity of depression (p-value=0.9095). No association was seen between depression and body mass index at baseline (p-value=0.6226). **CONCLUSIONS:** Results should be interpreted cautiously given the lack of variability in weight change in this study population. However, our findings suggest no association between depression and weight change among Hispanics enrolled in a chronic care management program.

IS THERE A LINK BETWEEN HEALTH LITERACY AND MEDICATION ADHERENCE IN HISPANICS WITH UNCONTROLLED DIABETES?

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Background: In 2015, 30.3 million (9.4% of the U.S. population) people had diabetes and an estimated 1.5 million Americans are newly diagnosed each year. The objective of this study was to assess the association of health literacy and medication adherence among participants of the Salud y Vida, a chronic care management program that enrolls Hispanics with uncontrolled diabetes in the Rio Grande Valley. **Methods:** At baseline, health literacy was assessed using the BRIEF Literacy screening tool and medication adherence was also assessed among 1,979 participants. Medication adherence was categorized into low (0-5), medium (6-7) and high (8); health literacy was likewise categorized as limited (4-12), marginal (13-16) and adequate (17-20). Chi-square analysis was performed to examine the univariate association between medication adherence and health literacy and odds ratios and 95% confidence intervals were estimated to describe the association of interest. **Results:** A statistically significant association between levels of health literacy and medication

adherence (p-value<0.0001) was observed. Most individuals with adequate health literacy had high medication adherence levels (60%) and those with limited health literacy had low (30%) or medium (47%) medication adherence. Participants with adequate health literacy were more than 11 times more likely (OR=11.40, 95% CI: 2.63, 49.41) to have high medicine adherence as opposed to those with limited health literacy. **Conclusions:** This study demonstrates the need for providers to address health literacy among Hispanics with uncontrolled diabetes to support medication compliance and diabetes control. Future studies could focus on specific implementation strategies in this population.

PHYSICAL ACTIVITY AND WELL-BEING: A STUDY OF HISPANICS ATTENDING FREE COMMUNITY EXERCISE CLASSES.

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Background: Physical activity (PA) is recommended as part of a healthy life style, yet, the right amount or intensity of PA and its relationship with well-being is not well established. We sought to examine class attendance/PA intensity and its association with well-being in Hispanics attending free exercise classes. **Methods:** Survey data were collected from Hispanics attending exercise classes randomly selected for evaluation as part of Tu Salud ¡Si Cuenta! program in the RGV. Participants (n=222) self-reported number of days/minutes engaging in mild, moderate or vigorous PA. Total METs were calculated and used to categorize PA as: Sedentary (0), Light (1-599), Moderate (600-1499) or Vigorous (>1500). Well-being was assessed using the Mental Health Continuum Short Form. Total scores were used to categorize well-being as: languishing, moderate and flourishing mental health. Chi-square test was used to examine association between well-being and frequency of class attendance or intensity of PA. Chi-square tests were also stratified by gender to assess confounding. **Results:** Individuals who attended free community exercise classes were typically over the age of 40 (72%), female (92%) and completing multiple exercise classes a week (79%). Except for three individuals surveyed (n=222), participants were found to have moderate to flourishing mental health (97%). No association was found between well-being and frequency of class attendance or PA intensity. No evidence of confounding by gender was observed. **Conclusion:** Results suggest that Hispanics attending free exercise classes have moderate to flourishing mental health regardless of levels of self-reported physical activity.

IMPACT OF ACCOUNTABLE CARE ORGANIZATIONS ON ACUTE CHOLECYSTITIS OUTCOMES IN THE RGV

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Background: Accountable care organizations (ACO) are a critical part of the Affordable Care Act designed to improve the health of Medicare beneficiaries by providing high-quality care, and reducing costs, by preventing duplication of services in the primary care setting. The objective of this study was to compare results of patient care in patients admitted with acute cholecystitis between pre-ACO and post-ACO. **Methods:** A difference-in-differences analysis was conducted on a retrospective cohort to compare severity scales, postoperative complication rate, diagnostic imaging modality, and length of stay in patients with acute cholecystitis from a post-ACO implementation period (January 2014- December 2015) to a pre-ACO period (January 2011 - December 2012) in the Rio Grande Valley (RGV).

Results: The study comprised of 400 patients with acute cholecystitis (198 pre-ACO and 202 post-ACO patients). As contrasted to the pre-ACO period, post-ACO patients had significant (P<0.0001) higher rates of disease severity (14.4% vs

8.4%), emergency admissions (90.1% vs 74.2%), CT scan use (55.5% vs 27.8), and prolonged length of stay (5.2 vs 3.9 days). **Conclusions:** This study corroborate that patients treated for acute cholecystitis in the ACO period were found to have an increase in disease morbidity, required more emergency admissions, needed more extensive management, with a prolonged length of stay, when compared with those in the pre ACO period. This study suggests that for patients admitted with acute cholecystitis, the implementation of ACOs shift the cost from primary care to the non-affiliated hospital, and provided patients with an overall lesser level of care.

COMPREHENSIVE INTERVENTIONAL RADIOLOGY ORDER SETS: DECREASING TIME TO INTERVENTION

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Background: Delays in interventional radiology (IR) procedures can result in significant cost to patient. Previous studies suggest increased preprocedural wait times account for two thirds of delays related to IR procedures (1,2). In the past, previous studies have looked at delays from non-procedural time in getting patients to the IR suite (2). Our aim was to focus on the effect of order simplification on routine IR procedures on procedural start times from time of order to arrival in IR suite on an inpatient population. Method: We retrospectively measured the time from order entry to arrival at radiology unit on a list of most relevant procedures to surgical practice. IR comprehensive order set was created for the above procedures and applied through Cerner and measured over the next three months. Time to arrival was compared to time stamps prior to order set implementation with statistical analysis. Result/Discussion: We anticipate that there will be a decrease in the amount of time to procedural start with a comprehensive order set for common procedures. This will be associated with a decreased length of stay, and decreased rate of morbidity for patients.

IMPROVING THE INFORMED CONSENT PROCESS IN THE ICU

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Background: The informed consent process is a critical part of patient care. There are no standardized guidelines for how to obtain consents [1]. Consent practices vary among institutions and types of ICU's. [2]. There are however, institutions that use universal ICU consents that cover common ICU procedures. Methods: The objective is to improve the consent process in the ICU, by offering Universal Consents to ICU patients that will include commonly performed procedures that will be reviewed upon admission to the. The procedures will include chest tubes, arterial lines, central lines, peripherally inserted central catheter, pulmonary artery catheter, Endotracheal intubation, Nasal and orogastric tubes, small bore feeding tubes, Bronchoscopy, Thoracentesis, Lumbar Puncture, Paracentesis. Results: The hospital committee for critical care has approved the universal consent and the hospital committee on trauma has improved the consent as well. The consent is now being presented to the Surgical committee and is currently being created into standard operating procedure. Conclusions: The informed consent process is a perhaps one of the most critical aspects of patient care. It is the time for patients and physicians to discuss treatment plans and have a contract on the plan of care. Here at DHR, both Intensivists and Surgeons agree with the notion of a universal informed consent process. Several institutions have had success with this process and at our hospital, we hope to have the same success.

MODERATELY DIFFERENTIATED ADENOCARCINOMA IN COLON FOUND BY EXPLORER LAPAROTOMY

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Background: Colorectal cancer (CRC) is one of the most prevalent neoplasia at west countries. CRC prevalence depends on age, increasing after 50 years. **Case Presentation:** Female 37-years showing abdominal pain by 2-days in evolution; tegument pallor and mild mucous dehydration. Pulmonary fields good ventilated, tachyarrhythmic cardiac noise, globe abdomen with surface and depth pain. Arterial pressure=100/60 mm, cardiac frequency=120 bpm, respiratory frequency=23 bpm, temperature=36°C; leucocytes=14,000, neutrophils=86, hemoglobin=10, platelet=400,000, creatinine=1.0, glucose=100. Patient reported no previous neoplasia, no hypertension, no diabetes. We diagnosed pelvic peritonitis, and applied physiologic solution (1 L), metronidazole=500 mg, ceftriaxone=1 g. Doppler ultrasound reported free liquid at pelvic hollow. Explorer laparotomy was followed by medication with metronidazole, ceftriaxone, and amikacin. Laparotomy detected ~1 L of purulent liquid, omentum firmly adhered to 5-cm tumor distant 5 cm of descendant colon and to 5 cm of angle. Transverse colon was expanded, descendant colon and the other parts of abdominal cavity were normal. Pathological report indicated one tumor at wall of colon with 1.5 cm length where one exophilic tumor (6x6x4 cm) was protruded and occluding 90% of colon light; adhered to serous wall we found one omentum of 23x13 cm. Diagnosis reported one invader adenocarcinoma moderately differentiated, infiltrated until serous wall. Ganglia were negative for metastasis and fibrinopurulent peritonitis. After 7 days, patient left hospital without complications.
Conclusions: CRC is suspicious in patients with recent changes on depositional rhythm, rectal bleeding, hematochezia or chronic anemia attributed to blood hidden in the stool; their survival depends on tumor stage at diagnostics.

BARIATRIC SURGICAL SITE INFECTIONS: PATTERNS AND PREVENTION

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Background: As a member of the MBSAQIP, our Center engages in an annual quality project. For 2017, the focus was on quantifying and understanding a noted increased incidence of surgical site infections (SSI). **Methods:** From January-June 2017, all bariatric surgeries performed at our institution by four surgeons were reviewed and patient and procedure data were collected. **Results:** 218 bariatric procedures were performed. Of those, 5 (2.29%) developed an SSI. Three were RYGB, one was a band converted to RYGB, and one was a band converted to gastric sleeve. Two surgeons had patients with SSI. Four (80%) SSI were at trocar sites (3 LUQ, 1 epigastric), one (20%) was a deep organ SSI and required readmission. Four (80%) patients were female, 3 (60%) were diabetics, and none were current tobacco users. SSI patients ranged in age from 29-63y (median 35y) and BMI ranged from 24-55 (median 35.3). All RYGB SSI cases used an EA stapler. Additionally, 3 (75%) of the RYGB SSI cases used a set of anorectal dilators to spread tissues prior to EA stapler insertion. Neither surgeon without SSI cases used the EA stapler or dilators. **Conclusions:** SSI are an unwelcome complication in any surgical specialty. As part of a QI study to account for an uptick in SSI in our bariatric procedures, we have discovered a potential source for infection; namely, tracts at trocar sites created by anorectal dilators and EA staplers. Additional study of surgical techniques, patient characteristics, and SSI is underway.

TRENDS AND VARIATIONS IN FEMALE BREAST CANCER ALONG THE TEXAS-MEXICO BORDER

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Background: Breast cancer is the leading cause of cancer death in Hispanic women. The counties along Texas-Mexico border region, which consist predominantly of a Hispanic population, share the worst health disparity statistics in the U.S. In this study, we investigate incidence and survival of breast cancer and explore whether these findings corroborate the trends seen in state and national surveillance reports. **Methods:** We used data on breast cancer between 1995-2015 from the Texas Cancer Registry. Crude and age-adjusted incidence rates overall, invasive, and noninvasive were created for the state overall and by border status. Adjusted median OS (95% CI) was calculated for female breast cancer by border status. **Results:** Adjusting for age, a decrease in the incidence ratio (IR) of overall and invasive female breast cancer is observed from 2000-2004 followed by relative stability from 2005-2010. After adjustment for age group, race, poverty level, grade and stage, hazard analysis revealed a lower hazard of death favoring border counties versus non-border counties, 14% and 12%, respectively, for both invasive and noninvasive breast cancer. Stratification by poverty level reveals no difference in the hazard of death amongst those with poverty from 0-9.99%. Those belonging in lower poverty tracts, 10-19.9% and 20-100%, there is a 10% reduction in the hazard of death for both overall and invasive cancers that is statistically significant. **Conclusion:** Our results indicate that women of all races in a low poverty level (>10%) and those living on the border counties have a significantly lower hazard of death.

ASSOCIATION BETWEEN LEVELS OF PHYSICAL ACTIVITY AND FREQUENCY OF DEPRESSED MOOD AND ANHEDONIA ON PHQ-2 AMONG INDIVIDUALS WITH UNCONTROLLED DIABETES

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Background: Hispanics are the largest ethnic minority group in United States. The prevalence of depression and co-morbid depression in Hispanic population is well-recognized. The positive association between physical activity and psychological health improves mood, emotional well-being, and prognostic outcome. A chi-square analysis was conducted to examine whether levels of physical activity reported at baseline were associated with the frequency of depressed mood and anhedonia self-reported for the previous two weeks. This study utilized the PHQ-2 scale for assessment of depressive symptoms. Participants were from the Salud y Vida Program for uncontrolled diabetes and were stratified on basis of their gender and preferred language. Data was collected and represented in tables according to demographic characteristics. We used the Cochran-Mantel-Haenszel (CMH) chi-square test to determine whether the association remained the same after adjustment. Our study established a statistically significant association between levels of physical activity and frequency of depression symptoms among Spanish speaking SyV participants. These results provide evidence that biological, developmental, social, and psychological factors facilitate the association between physical activity and depression. Results should be interpreted cautiously given the potential for selection bias and confounding. The results of the study imply an effect of physical activity on depression as validated by the statistically

significant association between physical activity and depressive mood symptoms among Spanish speakers. The present study provides additional support for a well-established association between physical activity and reduced depression in Hispanic populations.

URBAN LEVEL ONE TRAUMA CENTER DESERT ALONG THE US-MEXICO BORDER: A DESCRIPTIVE ANALYSIS OF TRAUMA TRANSFERS FROM THE RIO GRANDE VALLEY, TEXAS

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Background: The Rio Grande Valley (RGV), Texas is a fast-growing urban population in the United States (US) (currently 1.3 million citizens). It remains a large urban area in the US without a level one trauma center. Geographically isolated along the United States – Mexico border, with the nearest American College of Surgeons (ACS) verified level one trauma center 250 miles away. This study sought to define the types and volume of trauma patients being transferred from the RGV to San Antonio, TX (SA). **Methods:** Data on trauma transfers from the four counties of the RGV to SA was obtained from 2015 – 2018 from the Southwest Texas Regional Advisory Council (STRAC) dataset. A retrospective cross-sectional study was performed examining demographics, injury types, transfer method, and discharge criteria. **Results:** From 2015-2018, 836 total transfers took place from the RGV to SA (67% male, 33% female). Half of the transferred population was under 18 years old. 402 (48%) patients suffered blunt injuries, 202 (24%) burn injuries, 81 (10%) penetrating injuries, 145 (17%) multiple coded injuries, and 6 (1%) non-coded injuries. Of those transferred, most were sent via ground ambulance (70%) and 25% via helicopter/fixed-wing. 98% of patients survived to discharge from the receiving hospital. **Conclusion: Annually**, over 200 trauma patients from the RGV are transferred 250 miles to the nearest level one trauma center. Further studies are necessary to examine the burden of lacking an ACS verified level one trauma center in a geographically isolated, densely populated region.

THE PREVALENCE OF SELF-REPORTED STRESS FACTORS AND STRESS MANAGEMENT STRATEGIES IN A HISPANIC POPULATION PARTICIPANT OF THE PROGRAM "SALUD Y VIDA" AND THEIR RELATIONSHIP IN HGA1C LEVELS.

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Background: Diabetes is a chronic disease that affects 30% in the Mexican American adults residing near the US-Mexico border. Glycemic control has been proven to be related to stress levels. The objective is to describe and analyze the self-reported stressors and stress management techniques in patients with Diabetes Mellitus that participate in the "Salud y Vida" (SyV) of the Rio Grande Valley and it's relationship to HgA1C level. **Methods:** This is a secondary data analysis of the "SyV" project data that was conducted to examine the relationship between self-reported stressors, self- reported stress management techniques and HbA1C levels. A Wilcoxon Rank Sum test was used to compare HbA1C levels in the groups. **Results:** The sample had 5,722 participants, 68% females, 69% Spanish speaking, 70% over the age of 50 with "less than High School" education (67%) and uninsured (75%). The HbA1C levels ranged was 6.2%-18.7%, median of 9.2% (SD=1.56). The median of stressors was 1 (range: 0-17) with "Family" (20%) and "Health-Related" (22%) most common.

The most commonly reported stress management technique was watching TV (9%). There was a statistically significant difference ($p<0.001$) in median HgA1C at baseline with a positive relationship; a higher HgA1C with a higher among of stressors. **Conclusion:** There was no significant relationship in HgA1C change with stressors and stress management techniques. There was a higher baseline A1C level in those who reported higher number of stressors. More studies with specific descriptions and monitoring thought the "Salud y Vida" population is needed for further analysis.

QUALITY IMPROVEMENT ON OBESITY DOCUMENTATION AND MANAGEMENT

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Background: Obesity is an epidemic disease increasing worldwide. Recognition of obesity as a medical problem in primary care is essential to preventing detrimental health conditions. The aim of this quality improvement project is to analyze the trends in documentation of obesity as a medical problem in our graduate medical clinic (GME) and implement a reminder system in the health record to increase compliance with documentation. **Methods:** The first part of the project was a chart analysis that included data from our GME Internal Medicine Clinic from July 1, 2018 to April 1, 2019. Inclusion criteria was charts of patients with BMI >30. New patient and chronic disease follow up charts were included. Sick visits or encounters addressing one problem were excluded. Data was gathered by six medical residents who each analyzed twenty five patient charts. The assessment & plan or visit codes containing obesity related documentation, were plotted on a separate patient de-identified excel spreadsheet. **Results**: Out of 200 charts, only 179 were included in this study. Most of the patients were females 106(59%). Across all BMI ranges, approximately 64% charts contained obesity related documentation. The largest subgroup was BMI 30-35, which consisted of 44% of charts analyzed. When obesity was documented, management options were offered in the documentation approximately 88% of the time. **Conclusions:** Documentation of obesity and management is more common with increasing BMI. When obesity is documented in chart, management is more likely to be offered. Implementation of a reminder systems should help increase compliance with documentation.

POSTER PRESENTATION ABSTRACTS

Undergraduate Category

R WEB INTERFACE FOR KINASE SUBSTRATE PREDICTIONS

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Background: CoPhosK is a computational method which uses mass spectrometry based phosphoproteomics data. This method uses this data to predict kinase substrate associations. Phosphorylation is a post translational modification where a protein kinase attaches a phosphate group to a protein site. We introduce a R based web service to take this algorithm and let other researchers test their data online. The importance of this project is the way the algorithm works, it is one of the first computational methods that predicts these substrate associations based on context specific data such as breast cancer or colon cancer. Currently 90% of the kinases responsible are unknown. Although the algorithm has tested for some kinases already it can predict different kinases for new phosphorylation data. Cophosphorylation is the biweight midcorrelation value of two phosphosites. **Method**: The method used in CoPhosK is a naïve bayes probabilistic approach using a cophosphorylation network. We use the Bayesian rule to compute the log likelihood of the association of phosphosites with a specific kinase using the weights of edges in this cophosphorylation network. **Results**: The running time is substantial and there is an option to save the data in the database of the R application. We developed a code base that can clean data and put it through the CoPhosK algorithm and return the top arbitrary number of kinases that most likely phosphorylated each specific phosphosite.
Conclusion: In conclusion CoPhosK is a useful algorithm and making it available to other researchers can help impact future research papers and breakthroughs in bioinformatics.

FAMILY-BASED GENOME-WIDE ASSOCIATION STUDY IDENTIFIES 13Q12 ASSOCIATED WITH MAJOR DEPRESSIVE DISORDER AND ALZHEIMER'S DISEASE

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Background: Major depressive disorder (MDD) and Alzheimer's disease (AD) are comorbid; while MDD may be associated with the development of AD. There's little knowledge of genetic variants that cause MDD and its genetic link to AD. Methods: This study aims to conduct a genome-wide association study (GWAS) of MDD to search for novel genetic variants using a family-based design. The genes will be examined for an association between MDD associated genes and AD (pleiotropic effects) using a family-based sample (1266 AD cases and 1279 healthy relatives and 422 MDD patients with 1688 non-MDD individuals). Association with the risk of MDD and AD was assessed by family-based association test using PLINK software and haplotype analysis using generalized estimating equations (FBAT- GEE) statistics in PBAT software. Results: Family-based GWAS identified 12 SNPs associated with MDD with $p<10\text{-}5$. The most significantly associated SNP was rs930436 ($p=1.28x10\text{-}6$) within PAXIPI gene and the second-best hit was rs1376088 ($p=1.97x10\text{-}6$) within LOC152594 gene. Interestingly, among the 12 SNPs, rs12875434 within LOC646164/DDX39AP1 gene

at13q12 was associated with both MDD (p= 3.54x10-6) and AD (p=0.03216). At 13q12, 18 SNPs including the rs12875434 built a haplotype block, of them 12 SNPs within the block were associated with MDD; 4 SNPs (rs12875434, rs12584878, rs1365244 and rs1330918) were associated with MDD and AD. Haplotype analyses further supported the associations of LOC646164/DDX39AP1 gene at 13q12 with MDD and AD. Conclusion: The 13q12 region was associated with MDD and AD. This knowledge will lead to more research into the comorbidity of MDD and AD.

SPINAL CORD INJURY: ONE-SIDED THERAPY, TWO-SIDED BENEFITS

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Background: Spinal cord injury (SCI) is a highly debilitating condition. While many rehabilitation paradigms have been used in this population to alleviate motor and sensory disability, less than 1% of those with an SCI experience full neurological recovery. Therefore, it remains critical to identify new techniques to improve rehabilitation interventions in those with a SCI. Here, we sought to evaluate if rehabilitation targeted to one side of the body could result in motor recovery on each side of the body in individuals with SCI. **Methods:** Thirteen subjects with chronic cervical SCI were evaluated before, after and three-months after a two week rehabilitation program. We evaluated changes in hand and arm function on both sides of the body, since individuals with SCI have stated that they would most like to improve function of their upper limbs. We determined if one-sided rehabilitation was beneficial using two-way ANOVAs.
Results: Our results suggest that one-sided rehabilitation can improve dexterity in the targeted hand up to 25% in subjects. We also observed that there was a 17.5% gain in dexterity in the hand not targeted by therapy (range: 0% - 44.3%) . Gains in hand dexterity in the targeted and non-targeted hand were positively correlated (r=0.47). This suggested that gains in targeted hand dexterity were related to gains in the non-targeted hand. **Conclusion:** Our study found that rehabilitation focusing on only one side of the body can greatly increase motor function in both the targeted and non-targeted side of the body.

A NOVEL A-TROPOMYOSIN MUTATION (D55N) ASSOCIATED WITH FAMILIAL DILATED CARDIOMYOPATHY INCREASES TROPOMYOSIN BINDING TO ACTIN: MECHANISTIC INSIGHTS BY MOLECULAR MODELING

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Background: α-Tropomyosin (Tpm) mutations have been reported as a cause of both hypertrophic cardiomyopathy and dilated cardiomyopathy (DCM). In this study, we made the in-vitro functional studies actin-sliding-over-myosin velocity and the mutation variant association were tested with a TPM1 mutant D55N. This mutant was found in a four-generational Mediterranean family, and phenotypically produces DCM. **Methods:** Clinical evaluation and family history were obtained on the proband and from family members. Genotyping of the family members was performed in clinical laboratories and Progeny software was used for pedigree analysis. Actin-binding capacity of recombinant D55N-Tpm was measured using actin co-sedimentation assays comparing with recombinant WT-Tpm. To test motility, Alexa-568 phalloidin-labeled F-actin movement assay was performed with WT or D55N-Tpm presence. **Results:** The D55N mutant caused dilated cardiomyopathy in family members with an autosomal dominant pattern. The actin-sliding-over-myosin velocity of the D55N-Tpm was higher than WT (4.1±0.2 μm/s vs. 2.9±0.2 μm/s, $p<0.05$). The D55N mutant showed an increased affinity to actin compared to the WT-Tpm ($p<0.05$). **Conclusions:** Our study showed that D55N mutant increased calcium sensitivity and velocity at pCa (5.5-6.0) and actin binding affinity, which could result in the reduced duty cycle during the actin-propelled myosin process.

POLYMORPHIC CRYSTALS IN MEDICINE: A REVIEW

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Background: Polymorphs are chemical compounds with the potential of existing in more than one form. The concept of polymorphism has been known since the early 1800s when Eilhard Mitscherlich (1822), a German chemist, found that the same phosphate salt could exist in different crystal forms. Conformational polymorphism occurs when the exact same molecules exhibit themselves in different crystal forms due to differences in the arrangements of the atoms caused by rotations at the single bonds. This produces molecules with varied physical properties and functionalities that have applications in products of daily usage including cosmetics, pharmaceuticals, and agrochemicals. **Methods:** The important techniques which are mainly used in depicting the structures of the polymorphs include X-ray crystallography, neutron diffraction, solid state NMR and electron diffraction. **Results:** In 1965, McCrone established the significance of polymorphism in the field of pharmaceuticals. For over two decades, the scientific community and pharmaceutical industries have been increasingly recognizing the significance of polymorphic compounds in medicine. Compounds which will be discussed here include spiro and hydantoins. Spiro compounds have versatile applications as pharmaceutical and biological agents. Hydantoins are known to have antitumor anticonvulsant and antidiabetic activity. **Conclusions:** The important properties of chemical compounds to be considered during drug development are their solubility, bioavailability, stability, and dissolution. Furthermore, most drugs fail clinical trials due to concerns with their efficacy, safety, and solubility. Such issues may be resolved by choosing the polymorphs with desirable characteristics. This paper will discuss the use and significance of polymorphs in pharmaceutical products and medicine.

UNCOVERING THE ANATOMY OF THE INJURED SPINAL CORD WITH BRAIN STIMULATION

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Background: Following a spinal cord injury (SCI), clinicians perform an examination to understand how damaged, or complete, an injury is to the spinal cord. While informative, current classifications of completeness of SCI have large within-category variability. Such variability makes it difficult to understand the mechanisms of recovery in these patients. Therefore, our objective was to determine if transcranial magnetic stimulation (TMS) may help clinicians more quantitatively define the incompleteness of injury after SCI. **Methods**: We evaluated baseline function and incompleteness of injury, using the SCI Impairment Scale (AIS Score), in thirteen subjects with an injury to the cervical spinal cord. TMS was used to define incompleteness of injury using metrics collected in a muscle innervated rostral and caudal to the injury. We then evaluated how incompleteness of injury was related to baseline function and the AIS grade using regression analysis in SPSS. **Results**: Within the AIS D classification, we observed substantial variability of TMS-defined incompleteness of injury (12.73 ± 16.54). Interestingly, our observed variation in TMS-defined incompleteness of injury within the AIS D subjects was directly related to baseline motor function of the SCI subjects ($r=0.77$; $p=0.01$). This finding suggests that individuals with more baseline function were those with more incomplete AIS D injuries. **Conclusions**: Our results suggest that TMS can be used to understand the substantial within-category variability that exists with the AIS exam. We anticipate that our findings will help guide clinicians to better understand the recovery patterns in individuals with SCI.

ARCHITECTURAL CHANGES OF THE SPINAL CORD AFTER INJURY

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Background: A spinal cord injury (SCI) to the cervical spine, termed tetraplegia, remains a severely disabling condition affecting nearly 174,000 individuals in the United States. Current rehabilitation strategies may help patients, but due to the lack of personalization, progress is often hindered. To improve therapy, we must determine whether certain biomarkers, such as neuronal sparing, contribute to increased therapeutic benefit. Our goal was to evaluate the changes in the neuronal sparing in the spinal cord and determine its influence on therapeutic recovery potential. **Methods:** We utilized T2-weighted images to observe the spinal cord in patients with an SCI and healthy controls. "Spinal Cord Toolbox", an opensource software, was used to map and digitally straighten the spinal cords. The cross-sectional area extrapolated from the software was used as a metric for neuronal sparing. The cross-sectional area was then analyzed at the site of, rostral, and caudal to the injury. We determined the relationship between the spinal cord cross sectional area, muscle strength and therapy efficacy using regression analysis. **Results**: We found a 50.56% loss of white matter at the site of the injury, 42.83% rostral to the injury, and 36.51% caudal to the injury when compared to healthy controls. Regression analysis suggested that patients with more residual neurons post-injury recovered more muscle strength following two weeks of rehabilitation (R=0.742). **Conclusions:** Overall, our results suggest that spinal cord cross-sectional area may serve as an ideal biomarker to determine the recovery potential of any patient with an SCI.

DETERMINATION OF GENETIC VARIANTS OF THE VITAMIN D RECEPTOR OF THE *APAI* POLYMORPHISM IN PATIENTS WITH ACTIVE PULMONARY TUBERCULOSIS

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Background: Tuberculosis is an infectious disease that mainly affects the lungs. Several polymorphisms have been associated with resistance or susceptibility to tuberculosis, including the gene that codes for the vitamin D receptor. Vitamin D is one of the mediators that impairs the growth of ***Mycobacterium tuberculosis*** in the macrophage. *The Apal* polymorphism of the VDR gene is considered a factor for the development or resistance of this disease. **Methods:** The patients were 19 with active pulmonary tuberculosis. The DNA was extracted from the white blood cells of the peripheral blood of the patients, the polymorphism of the VDR gene was analyzed with the polymerase chain reaction (PCR) method and with the restriction fragment length polymorphism (RFLP). The product that was digested with *Apal* enzyme was run electrophoretically on a 2% agarose gel containing ethidium bromide for 60 minutes at 100 V. **Results**: A higher prevalence in the AA genotype was found in the studied patients with a frequency of 68.4%. Regarding the Aa genotype, it has a frequency of 31.6%. No subjects were found with the aa genotype. **Conclusions:** It is concluded that polymorphism is considered a risk factor for developing tuberculosis, being the wild type homozygous genotype more significant in patients with active tuberculosis in the population of Reynosa, Tamaulipas.

CROSS-SECTIONAL STUDY OF CARDIOVASCULAR RISK FACTORS AMONG COLLEGE STUDENTS

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Background: A college student's behavior might include a decrease in exercise and an increase in sedentary time. This can be accompanied by changes in sleeping patterns, increased stress, weight fluctuations, and changes in nutritional habits. Without intervention, these college-life behaviors can possibly risk the development of cardiovascular disease (CVD). The objective of this study was to assess the cardiovascular risk factors among college students. **Methods:** An evaluation of blood pressure and a survey questionnaire was used to determine CVD risk factors for this cross-sectional study. The survey questions consisted of: family history of HTN, diabetes, obesity, dyslipidemia, smoking history, and eating/exercise habits. A random sample of 120 voluntary college students between the ages of 18-23 were recruited for this study, (both males and females from all class levels). The top stressors were determined and a comprehensive analysis of students' lifestyle habits was gathered. **Results:** The results demonstrated that 28.3% of the students had elevated blood pressures, 73% presented risk factors for CVD, and 52% have a BMI higher than 25 (Overweight–Obesity:<25). The top three stressors that these students faced were academic studies (83.9%), financial issues (71.7%), and employment (49.7%). Students in other colleges had better diet and exercise habits compared to those in the College of Health Professions. **Conclusion:** Considering the results, it is concluded that there is a high prevalence of CVD risk factors among college students. The results established a need for increased screening, awareness, and management of cardiovascular risks in students.

DETERMINATION OF THE PREY RANGE OF *BDELLOVIBRIO BACTERIOVORUS* IN A RESISTANT DRUG STRAIN OF *PSEUDOMONAS AERUGINOSA* OF CLINICAL INTEREST

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Background: *Pseudomonas aeruginosa* is a pathogen that causes nosocomial infections presenting a high level of drug resistance, hindering effective treatment. Unlike antibiotics, the mechanisms of resistance do not represent any obstacle for their elimination in their interaction with *Bdellovibrio bacteriovorus* being considered as an alternative treatment for this type of infections. It is estimated that these effects will reduce bacterial concentration in a certain period of time. **Methods:** An experimental study was carried out, carrying out a triplicate test in which *Bdellovibrio bacteriovorus* inoculated with *Pseudomonas aeruginosa* was cultured, determining the concentration of each culture by measuring the absorbance at a wavelength of 600 nm in the Nanodrop equipment in 3 phases of 0 hours, 24 hours and 48 hours. To determine the growth differences of *Bdellovibrio bacteriovorus* in the three phases, a one-way ANOVA analysis was performed. **Results:** *Pseudomonas aeruginosa* showed a decrease in its bacterial population in the presence of *Bdellovibrio bacteriovorus* between phase 0 hours in relation to phases 24 and 48 hours, showing a mean absorbance in phase 0 hours of 0.027 ± 0.0036, 0.0093 ± 0.00057 in 24 hours and from 0.0050 ± 0.0036 in the 48-hours phase; obtaining statistically significant differences ($p = 0.0001$). **Conclusions:** The predatory characteristics of *Bdellovibrio bacteriovorus* by reducing bacterial populations rapidly makes it a candidate for potential both therapeutic and biotechnological applications.

QUANTIFYING VASOPRESSIN IN THE HYPOTHALAMUS SUPRAOPTIC NUCLEI IN THE ANIMAL MODEL OF ENDOMETRIOSIS

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Background: Endometriosis is a chronic disease in which endometriotic tissue grows outside the uterine cavity, causing pelvic pain and stress. Studies have shown that in some forms of prolonged stress there are morphological changes in the hypothalamic supraoptic nucleus, which release vasopressin, a neuropeptide postulated to have a significant role in the long-term stress response. We aimed to determine whether there is a modification of the supraoptic nucleus in rats with surgically induced endometriosis. *Methods:* Environmentally enriched (EE) rats were placed in larger cages with toys and nesting material, with novel toys being introduced twice a week until day 60, when endometriosis was induced. No enrichment (NE) rats were in smaller cages, had no toys, and were subject to the same timeline. Endometriosis was induced surgically in the EE and the NE rats by suturing pieces of the uterine horn to the intestinal mesentery. Sham rats had only sutures in the mesentery. The EE animals continued to receive new toys twice a week until day 120, the time of brain collection. Fluorescence immunohistochemistry was performed to analyze vasopressin fibers and supraoptic nuclei in the hypothalamus. Images were analyzed using ImageJ. *Results:* Preliminary results indicate that there is a significant percent increase in the immunolabeled area, and to a lesser degree, percent area occupied by vasopressin in the supraoptic nucleus of rats that have been environmentally enriched and not enriched, compared to sham. *Conclusions:* Our results indicate that endometriosis may alter supraoptic nuclei activity and activation of the vasopressinergic system.

THE ROLE OF IRBP IN 661W CONE PHOTORECEPTORS

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Background: Interphotoreceptor retinoid-binding protein (IRBP) plays a critical role in the visual cycle, as it mediates the transport of vitamin A derivatives between photoreceptors. Studies have established the roles of IRBP in preventing photodegradation, and its potential in the treatment of diseases such as diabetic retinopathy (DR). Diabetic patients express reduced levels of IRBP, however its contribution to the development of diabetic retinopathy (DR) remains unclear. The aim of this study was to begin to explore if glucose concentrations impacted the levels of IRBP secretion by cone photoreceptors. Because IRBP is synthesized by photoreceptors, we hypothesize that diabetes reduce IRBP by an inhibition of its biosynthesis in the retina. Thus the aim of the present study is to investigate in-vitro if high glucose attenuates IRBP synthesis in cone photoreceptors. **Methods:** 661W cone photoreceptors were cultured and treated for 24 hours with either hypoglycemic (0 mM), euglycemic (5.5 mM), or hyperglycemic (30 mM) concentrations. IRBP mRNA levels were determined by using RT-PCR. IRBP expression was quantified in the condition media by ELISA and Western Blot, to determine significant differences in IRBP levels between the three groups. **Results**: Experiments and data analyses are currently being conducted. We anticipate that high glucose reduces IRBP mRNA in 661W cone photoreceptors and IRBP level in condition media. **Conclusions:** Results from this study will provide critically needed data to elucidate the role of IRBP in diabetes-related ocular complications. Detailed pathway will provide opportunities to design and evaluate novel approaches to protect and preserve human vision.

AIMING AT THE TARGET IN SPINAL CORD INJURY

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Background: Following a spinal cord injury (SCI), damage in the spinal cord can hinder neuronal signals sent from the br ain to the periphery resulting in varying degrees of paralysis and loss of function. We have found that one way to boost hindered signals is by pairing rehabilitation with transcranial direct current stimulation (tDCS). However, it remains uncle ar how the focality of tDCS to the targeted region affects functional outcomes. Therefore, our objective was to determin e if tDCS focality influenced motor outcomes in individuals with SCI. **Methods:** Seven subjects with cervical SCI were enr olled and received rehabilitation for two weeks. During rehabilitation, we applied tDCS to the site of a weaker muscle ba sed on the location of their SCI. We assessed changes in motor function before and after rehabilitation. We assessed ho w well tDCS current targeted the weaker muscle site using the software HD-
explore. We analyzed the relationship between the amount of current applied to the cortical representation and benefit s individuals exhibited following rehabilitation directly using SPSS. **Results:** We found that the amount of current targeti ng the weak muscle site ranged from 0.313 to 0.528 V/m. We identified a positive correlation between the amount of tD CS current and the change in motor function (R=0.87). This suggested that patients receiving a greater amount of tDCS c urrent to their weaker muscle representation showed more improvements in motor function. **Conclusions:** Overall, our f indings suggest that the amount of current delivered to weak muscle representations influences functional benefits fro m tDCS.

DECIPHERING THE RUINS IN THE SPINAL CORD AFTER INJURY

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Background: Currently over 9 months of rehabilitation are required to achieve meaningful improvements in function in patients with spinal cord injury (SCI). In order to improve rehabilitative efforts, it is critical to identify biomarkers that could serve as an indicator of rehabilitative responsiveness. The objective of our project is to determine if residual neuronal tissue bridges in the spinal cord after SCI may be one such biomarker and influence functional recovery.
Methods: MRI images were collected in eight subjects with cervical spinal cord injury. All patients then participated in two weeks of rehabilitation. We assessed changes in motor function before and after rehabilitation using the nine-hole peg test and muscle grading. We defined the physical properties of the tissue bridges using FSLview. We related the length, size and location of the tissue bridges to functional recovery metrics using regression analysis. SPSS software was used for statistical comparisons. **Results:** Notably, we observed that tissue bridges varied in size from 33.2 mm^3 to 2978.5 mm^3. In most subjects, tissue bridges spanned two vertebrae levels, with a maximum of six levels observed. We identified that subjects with a larger tissue bridge demonstrated reduced baseline function (R^2=0.306) and limited functional recovery (R^2=0.091). **Conclusion:** Our work has found that properties of spinal tissue bridges are directly related baseline function and recovery potential. Our findings encourage future research to evaluate mechanisms to decrease the presence of tissue bridges in spinal cord injury patients in order to improve recovery.

TYROSINE HYDROXYLASE PROTEIN IN THE DEVELOPING MIDBRAIN OF THE LABORATORY OPOSSUM (MONODELPHIS DOMESTICA)

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Schizophrenia is a worldwide disease, suggesting an underlying genetic contribution. Because it is a neurodevelopmental disorder, it is important to investigate the factors that influence gene expression in the developing brain. The objective of the present study is to characterize the expression of Tyrosine Hydroxylase (TH), an enzyme critical for dopamine synthesis and a putative Schizophrenia-associated protein, in the developing brain of the laboratory opossum (*Monodelphis Domestica)*. Dissections were performed from the midbrain at two developmental timepoints, PND_0 (at birth) and PND_1 (24 h post birth). Tissue was then lysed and protein extracted for spectrophotometry and western immunoblotting (WB), and imageJ software was used to quantify band densities. We have determined that extraction of the midbrain from a neonate (PND1-5) yields approximately 1,000,000 cells. After adjusting with a loading control, the WB procedure yielded a brighter band for TH at PND_0 (band density = 0.97) compared to PND_1 (band density = 0.19). Thus, our data suggest that TH protein levels are highest at birth and then decrease over subsequent developmental time points. We are currently running more WBs for additional animals and investigating other proteins. Characterizing TH expression over different neurodevelopmental time points is an important step toward developing *Monodelphis* as a model of neurodevelopmental disorders. Our long-term goal is to understand how Schizophrenia risk and susceptibility genes are impacted by environmental stressors. Comparing data from various Schizophrenia-associated genes allows a wider view of dopamine markers in brain areas that are associated with disease risk.

INSULIN: A RISK FACTOR IN THE PATHOGENESIS AND PROGRESSION OF PROLIFERATIVE DIABETIC RETINOPATHY

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Introduction: Proliferative diabetic retinopathy (PDR) is the leading cause of blindness among working-aged adults. It's estimated that 1 in 7 individuals diagnosed with diabetes in the Rio Grande Valley have PDR. Furthermore, insulin is routinely prescribed for the treatment of diabetes. We know vascular endothelial growth factor (VEGF) is the hallmark characteristic of PDR, therefore, we investigated the correlation between insulin and VEGF in 51 patients and Müller cells. **Methods:** A total of 51 study eyes were categorized by pathology and assessed for the presence of insulin and VEGF. MIO-M1 cells were cultured in recommended conditions and seeded in 24 well plates at 80,000 per well until 80% confluent. Cells were treated with medium containing either normal glucose (5.5mM) or high glucose (30mM) and insulin (0, 10,100,1000nM) for 24 and 48 hours. ELISA was used to measure VEGF in all samples.
Results: Vitreous VEGF levels were significantly increased ($p<0.05$) in the PDR group, in which insulin was found present in 11/33 (46.8 ± 80.3) of patients. *In vitro* studies showed a concentration dependent increase in VEGF with respect to insulin in both normal glucose (5.5mM) and high glucose (30mM) and at both time points, 24 and 48 hours.
Conclusions: Our *in vitro* results support the hypothesis that hyperglycemic condition acts upon retinal cells to increase VEGF output leading to higher VEGF levels in PDR group. Collectively, our results suggest a possible shift in the role of insulin from homeostatic maintenance to development and progression of PDR through upregulation of VEGF.

MIND OF MATTER: DOES DEMYELINATION INFLUENCE MOTOR RECOVERY AFTER SPINAL CORD INJURY?

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Background: When an individual undergoes a spinal cord injury (SCI), it is likely the clinical focus will be centered on the neck where it occurred. Our project will focus on the effects that white matter degeneration, in the brain, has on a patient's ability to perform mobility tasks and performance with rehabilitation. Methods: T1-weighted imaging and diffusion weighted imaging of the brain was collected in fourteen individuals with SCI. Following imaging, subjects received two weeks of tailored rehabilitation. We assessed changes in motor function before and after rehabilitation. The amount of white matter degeneration was manually determined using FSLview for the cerebral peduncle, motor cortex and pons. Regression analysis was performed to identify the correlation between demyelination in the brain, baseline function and recovery. Statistical analysis was gathered using SPSS. Results: We found significant demyelination in the pons, peduncle and the motor cortex, after SCI compared to healthy controls (p s (p s (p.

REDUCTION OF BREAST-FEEDING PRACTICES AND CHILD BIRTHS IN FOUR GENERATIONS OF BREAST CANCER WOMEN AND A CONTROL GROUP FROM NORTHEAST MEXICO

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BACKGROUND: Breast cancer (BC) is the most common cancer in women and one of the leading causes of death in the world, reporting approximately 1.4 million new cases annually. The risk factors to develop BC include reproductive history, menarche, menopause, age of first pregnancy, hormonal exogenous therapy and breastfeeding periods. Lactation reduces BC risk and it is associated with a better prognosis and a less recurrence rate of cancer. The aim of these study was to analyze the decrease of breast-feed, time lapse of breast-feeding and number of child births in women from northeast Mexico in BC women and a control group.

METHODS: Patients from Hospital Universitario "Dr. José Eleuterio González" were invited to participate. We included 1082 women, divided into four different groups of generations (between 1929 to 1995). Cases were women with BC (n=639) and controls were healthy women (n=443). Cases and controls were paired by age and SPSS v20 software was used. **RESULTS:** The rate of child births decreased 17.1% in BC cases and 18.9% in the control group. Also, we found that the rate of breast-feed decreased 17.2% in cases and 1.4% in the control group.

CONCLUSIONS: Rate of child births, breast-feed and time lapse of breast-feeding has been decreasing in northeast Mexico between 1929 and 1995. These factors may be influencing the increased incidence of breast cancer cases in northeast in Mexico.

IDENTIFICATION OF TRANSLATION INITIATION FACTOR 3 (IF-3) AS A MOLECULAR TARGET AGAINST *CLOSTRIDIUM DIFFICILE* INFECTION

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Clostridium difficile is an anaerobic pathogenic bacterium that causes antibiotic-associated diarrhea and pseudomembranous colitis. *C. difficile* infection (CDI) represents one of the most common healthcare-associated infections, results in significant morbidity and mortality worldwide. The treatment of CDI has become more challenging due to the rapid development of antibiotic resistance of *C. difficile* strains and high recurrence rate of CDI, which has led to the unmet need of discovery of effective narrow-spectrum antibiotics. Bacterial protein synthesis is an essential metabolic process and has been proved as a validated antibiotic target. Translation initiation factor 3 in *C. difficile* (Cd-IF3) is one of three IFs, functions to facilitate the binding of the 30S ribosomal subunit to the mRNA during protein synthesis. This study is to determine three-dimensional structure of Cd-IF3 by solution state NMR techniques and its interaction with the 30S ribosomal subunit. The Cd-IF3 gene was subcloned into pET24b vector to construct a C-terminal His-tagged DNA plasmid. The plasmids were transformed into BL21(DE3) cells for protein expression. The high-quality pure protein samples were obtained using Ni-affinity and gel filtration chromatography. The NMR data collected using pure Cd-IF3 proteins were analyzed and allowed us to determine the full-length structure of Cd-IF3. The structure was further used to build a structure model of Cd-IF3-bound 30S complex. This structural study provides a source for the understanding of IFs initiated protein synthesis machinery in *C. difficile* and structural insight onto structure-guided rational design of small molecular inhibitors.

PREVALENCE OF TUBERCULOSIS IN PATIENTS OF UNIDAD DE MEDICINA FAMILIAR # 40-IMSS FROM REYNOSA, TAMAULIPAS, MÉXICO DURING 2018

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Background: Tuberculosis (TB) is the ninth cause of death and the major infectious disease according to World Health Organization. There are multiple risk factors associated to TB, outstanding arterial hypertension, Diabetes mellitus, malnutrition, overcrowding, drug abuse, and HIV/AIDS. The aim of this work was to know prevalence of TB on patients attended at Unidad de Medicina Familiar # 40-IMSS (UMF40) of Reynosa, Tamaulipas during 2018 and some associated variables. **Methods:** Work consisted on review the files of TB patients attended during 2018 at UMF40 as well as the register and control booklet of diseased patients; and monthly reports of Sistema Nacional de Vigilancia Epidemiológica (SINAVE). Variables included age, gender, education, job, development and diagnostic method, associated diseases, etc. Patients were divided based on gender and then data compared with t-test for parametrical data and Mann-Whitney test for non-parametrical data. **Results:** We found 37 TB cases during 2018, 13 men and 24 women. Averaged age of TB patients was 40 years (women) and 29 years (men) ($p \leq 0.04$). Women showed more education ($p \leq 0.01$) than men as well as they work more frequently as peddler, housewives or are retired ($p \leq 0.01$); they showed malnutrition, D. mellitus or are abandoned ($p \leq 0.01$). Most of women TB patients died or still following the treatment ($p \leq 0.01$). **Conclusions:** TB prevalence on patients attended by UMF40 of Reynosa, Tamaulipas during 2018 is more frequent in adult-women with concomitant problems such as malnutrition or diabetes and they died or remain under treatment.

SUSCEPTIBILITY TO STRESSORS IN THE GRAY SHORT-TAILED OPOSSUM (*MONODELPHIS DOMESTICA)*

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Background: Humans and non-human animals experience a wide range of environmental stressors. The relationship between stressful experiences and changes in phenotypic behavior is a growing topic of interest. Our lab investigates psychological and psychosocial stressors in the laboratory opossum (*Monodelphis Domestica*).
Methods: We assessed changes in behaviors when stress was experienced. A group of animals was exposed to social isolation (psychosocial) stress and then tested in a social interaction task. Another group was exposed to handling (psychological) stress and tested in an open field. Subjects were tested in both stressful and low-stress conditions. We recorded behaviors using a camera and AnyMaze motion-detecting Software. The recorded behaviors were scored using Jwatcher software and data were analyzed with SPSS using a paired sample t-Test.
Results: Statistically significant changes in multiple behaviors occurred when comparing the high-stress to the low-stress conditions in 22 socially-isolated adult animals. Low-stress lead to decreases in social duration ($t_{(21)}$= 4.673, $p<.0001$), defensive duration ($t_{(21)}$=2.16, $p<.05$), and aggression ($t_{(21)}$=3.638, $p<.005$). Overall, animals were less aggressive in the low-stress condition. Although the sample size was low (n=4) in the open field test, our data suggests a reactivity to handling, as evidenced by an increase in freezing behavior due to stress ($t_{(3)}$=-2.455, $p<.091$). **Conclusions:** This study will provide valuable information of a lab animals' susceptibility to different forms of stress. Understanding how stress can affect behavioral changes in a general population will guide future investigations to identify certain phenotypes within a population and underlying neural mechanisms guiding these behaviors.

POSTER PRESENTATION ABSTRACTS

High School Category

ATRIAL FIBRILLATION IN HEALTHY HEART

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Background: Prevalence of atrial fibrillation (AF) is 0.4%, but patients up 80 years show prevalence >6%. AF could be registered on health heart patients, as isolated or sporadic AF. Patients with high or low heart compromise need pharmacological treatment in order to revert itself towards a normal sinus rhythm. AF is diagnosticated by using a prolonged electrocardiographic register (Holter-24 h) due it could be asymptomatic. **Case Presentation:** Female 57-yrs. Twelve derivation electrocardiogram detected AF. Then was supplied oral digoxin 0.25 mg and impregnation dose each 8 h and maintaining dose (0.25 mg). Patients is non-diabetic, not hypertense; arterial pressure = 120/80 mm Hg, maximum heart frequency = 80 beats per minute (bpm), minimum heart frequency = 60 bpm, cardiac noise = rhythmic, respiratory frequency = 20 breaths per minute, pulmonary fields good ventilated without rales neither crackling. Holter-24 h gave a prolonged electrocardiographic registering since 14:00 with present AF until 23:30 h after day. Patient showed a normal sinus rhythm. After, the patient went to periodical revision, heart monitoring and pharmacological treatment. After two months, patient has not registered AF. **Conclusions:** We report AF in one female with <60 years and with apparently healthy heart. Despite AF causes remain unknown, we suggest close follow due thrombosis risk.