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The Beat Newsletter

College of Medicine

The Beat

University of South Alabama
College of Medicine

JANUARY 1996

USA RESEARCHERS PROBE UNIQUE ORGANISM

The dictionary describes synergism as the "cooperative action of discrete agencies such that the total effect is greater than the sum of the two effects taken independently." **Drs. Herbert H. Winkler and David O. Wood**, colleagues in the Department of Microbiology and Immunology are working synergistically to investigate the bacteria that cause epidemic typhus and Rocky Mountain Spotted Fever.

Dr. Winkler is the Louise Lenior Locke Distinguished Professor and Vice-Chair of the department. For the past twenty-five years he has studied the interaction between *Rickettsia* and their host cells in relation to membrane lysis, fusion and phagocytosis. This research is the outgrowth of his early training at Harvard and Johns Hopkins University on the biochemistry and physiology of bacterial transport systems.

Professor David Wood joined the department in 1979 as an Assistant Professor in microbial genetics following postdoctoral training in microbial genetics at the Medical College of Virginia. For the past twelve years, Winkler and Wood have worked together as a team to isolate the genes that enables the bacteria to grow only inside a host cell.

Bacteria of the genus *Rickettsia* are the etiologic agents of Rocky Mountain Spotted Fever, as well as endemic, scrub and epidemic typhus. These are diseases that pose a serious threat worldwide. Epidemic typhus is capable of producing tremendous morbidity and mortality especially in impoverished areas where the classical precipitating factors of extreme poverty and overcrowding exists.

Despite the successes of public hygiene, the etiologic agent of epidemic typhus, *Rickettsia prowazekii*, has not been eliminated. In addition to individuals who carry the rickettsiae for many years there is an animal reservoir in the United States, the flying squirrel. Human cases of epidemic typhus have been attributed to contact with the flying squirrel and its associated ectoparasites. Thus, the potential for epidemic spread of epidemic typhus remains. The importance of the rickettsiae as agents of human disease is this: as one pathogen after another "emerges" to cause sickness and death, we must look at pathogens which exploit a niche that protects them from antibiotics and allows them to associate with lice, ticks and fleas that readily feed on humans.

Equally important as the human diseases is the unusual biology of the organism. *R. prowazekii* occupies a unique environmental niche. It grows in, and only in, the cytoplasm of eucaryotic cells. *R. prowazekii* is an obligate, intracellular parasitic bacterium. Instead of being enclosed within a vacuole, these organisms rapidly escape into the cytoplasm where they grow until the number of rickettsiae becomes so great the cell bursts releasing hundreds of infectious bacteria. How do rickettsiae exploit this cytoplasmic niche and why can they not grow outside of the host cell cytoplasm are important biological questions. All of the rickettsiae exhibit another interesting idiosyncrasy. They are associated with arthropod vectors, such as the human body louse which transmits the rickettsiae to humans. *R. prowazekii* pathogenicity centers on invasion of eucaryotic host cells, intracellular multiplication in the cytoplasm, and intracellular dispersion following lysis of the host cell. Thus, *R. prowazekii* is a human pathogen because it grows inside a cell and destroys its host cell.

Current efforts by Drs. Herbert Winkler and David Wood are directed toward an understanding of how *R. prowazekii* copes with the problems and exploits the opportunities of the intracellular niche. Winkler's research, which has been continuously funded by the National Institutes of Health for 25 years, is currently focusing on two fundamental problems of rickettsiology. How does *R. prowazekii* obtain energy in the form of ATP directly from the host cell and are rickettsiae able to regulate the expression of their genes at the transcriptional level? The ability of the rickettsiae to transport ATP (a trait not found in free-living bacteria) and to regulate their genes as conditions change is crucial to their survival inside the host cell. Wood, who has just received an additional five-year award from NIH, focuses his research on establishing a genetic system for *R. prowazekii* and the use of this system to examine rickettsial gene structure, function and organization. The ability to manipulate rickettsial genes and create defined mutants will identify those genes that are important in the invasion and destruction of human cells.

Together, these long time collaborators strive to gain a complete understanding of how the rickettsiae invade human cells and cause disease. The combination of the ground-breaking studies on rickettsial physiology and growth initiated by Dr. Winkler and the application of a powerful genetic approach to the study of these novel bacteria by Dr. Wood has led to a very successful collaboration that is able to address important questions about these unique human pathogens.

Answers to these questions by these USA researchers will provide fundamental knowledge about intracellular parasitism, that is applicable to a number of human pathogens, as well as yield specific information needed to design accurate clinical diagnostic methods and vaccines.

INSIDE:

STUDENTS RECEIVE EARLY CLINICAL TRAINING

How can a bright college graduate with a science background become a physician in only four short years?

This is a question that medical educators and each new class of medical students struggle to answer. Every year new developments in medicine must find a place in the curriculum. But even with the explosion of knowledge that is packed into the first two years of medical school, the old fashioned skills of physical examination and patient interviewing are still cornerstones of a good medical education.

To foster early development of clinical skills, a course in Physical Diagnosis will be introduced in the curriculum for first year medical students. Students will learn the basic physical diagnosis and patient encounter skills both in the classroom and in small group sessions with a preceptor. In the small groups, students will learn and practice on each other the techniques of physical examination such as auscultation, percussion and palpation - under the guidance of an experienced physician. This type of hands on learning makes medical school different from other educational experiences, and USA has always excelled at giving students the opportunity to learn first-hand from experienced practicing physicians.

In previous years students were taught both physical examination and history taking skills in a single course presented during the second year. The advantage for this years' class is students in the first year course can concentrate on physical examination technique and learn those skills well. During the second year, they will have a refresher course in physical diagnosis and add patient interviewing skills to their physical diagnosis foundation. This year's freshman class should arrive in the clinics during the third year clerkship with more confidence and a stronger base of patient interviewing and examination skills.

During the gruelling first year of medical school it is easy to lose sight of the ultimate goal - becoming an excellent physician. The Physical Diagnosis course will bring students back to the basics of medicine. They will get a chance to learn how to use those fascinating tools in the Doctor's black bag. With their new basic examination skills the students will be better prepared for clinical experiences in the summer between the first and second year of medical school.

The course directors for "Introduction to Clinical Medicine I: Physical Diagnosis" will be two physicians in the Department of Internal Medicine, Drs. Jim Hunter and Ron Allison. Dr. Allison is also director for the current second year course, "Introduction to Clinical Medicine". Dr. Hunter has taught physical diagnosis to medical students at three other medical schools and will try to use that experience to make this course a high point of the first year at South Alabama. Learning physical diagnosis in the first year will give this years' class of medical students a head start on the road to becoming physicians in only four years.

SECOND ANNUAL NATIONAL PRIMARY CARE DAY

University of South Alabama medical students joined classmates in medical schools across the nation for the second annual "National Primary Care Day" on September 28, 1995 in learning about primary care as a career option.

USA students planned several activities on campus and in the community to help both their classmates and the public to gain a better understanding of primary care.

Activities included a panel discussion by residents in the primary care fields of family practice, general internal medicine and pediatrics. Residents answered questions and shared their reasons for choosing a primary care career path. Topics discussed at various workshops included basic suturing techniques, rural medicine, tips on interviewing, reading chest X-rays, and ethical issues.

Dr. Carden Johnson, professor of pediatrics at the University of Alabama School of Medicine was a featured speaker. His presentation was entitled "Primary Care: Past, Present and Future".

The National Primary Care Day provided a chance to celebrate the significant contributions of primary care physicians to America's health and an opportunity for medical students to learn about the rewards and challenges of a medical career in primary care medicine.

Congratulations...

Mobile United has selected **Dr. Leonard Aldes**, Associate Professor in the Department of Structural and Cellular Biology, as one of the five outstanding community volunteers chosen to receive the Citizen's Service Award for 1995.

Dr. Langdon A. Hartsock, Assistant Professor of Orthopaedic Surgery, is the recipient of the 1995 Jack McDaniel Memorial AO Fellowship Award. The award will enable Dr. Hartsock to conduct a study of orthopaedic traumatology cases with Professors Reinhold Ganz and Thomas Ruedi in Chur and Bern Switzerland over an 8-week period.

Dr. Jack A. DiPalma, Director of the Division of Gastroenterology in the Department of Internal Medicine, was elected to the Board of Trustees of the American College of Gastroenterology. This organization represents over 5,000 clinical gastroenterologists and other specialists in digestive diseases.

NIH Study Section Appointment

Dr. David O. Wood, Professor of Microbiology and Immunology, has accepted an invitation to serve as a member of the Bacteriology & Mycology Study Section of the National Institutes of Health. Members are selected on the basis of their demonstrated competence and achievement in their scientific discipline as evidenced by the quality of their research accomplishments, publications in scientific journals and other significant scientific activities, achievements and honors.

Student Awards

Senior medical students, **Tonya Caylor** and **Rock Helms**, were named co-recipients of the Cope Memorial Scholarship for 1995-96. Each student received a $2,000 scholarship.

Shawn Bearson and **Thomas Penfound**, graduate students in the department of microbiology and immunology, were co-winners of the Southern Society of Microbiology Award for Excellence in Research.

Michael Sanders, a third-year medical student, was one of forty-five students selected for the Howard Hughes Medical Institute-National Institutes of Health Research Scholars Program. Mr. Sanders was selected from 206 applicants representing 87 medical schools. The selection process involved a comprehensive review of the submitted written application and supporting documents followed by individual interviews of selected applicants. The interviews were conducted by a committee of senior NIH scientists and senior scientific officers of the Howard Hughes Medical Institute. The research scholars receive a salary and fringe benefits from HHMI while enrolled in the program. He will conduct basic research under the tutelage of Neal Epstein, M.D. in the Cardiology Branch of the National Heart, Lung and Blood Institute.

GRADUATE RESEARCH FORUM/ VISITATION DAY

The Graduate Program in Basic Medical Sciences in the College of Medicine will host its Second Research Forum/Visitation Day on Friday, January 26, 1996. The program is being held in the University Center Ballroom to promote the research conducted by graduate students, faculty, and fellows in the five departments that represent the Graduate Program. The Forum is also intended to encourage the interest of undergraduate students in pursuing a degree in the basic medical sciences.

The day's events will begin with a welcome by Dr. Samuel Strada, Senior Associate Dean for the College of Medicine. Dr. Mary Townsley, Director of Graduate Studies for Basic Medical Sciences, will introduce the Graduate Program and the Basic Medical Sciences Department Chairs, prior to the individual departmental discussions, presentations and posters. These presentations will allow visiting undergraduate students from colleges across the Southeastern region an opportunity to gain general information about departmental requirements for admission and completion of the Ph.D. degree.

Visiting students, College of Medicine Faculty, graduate students, and guests will enjoy lunch, while participating in the research forum poster presentations and discussions.

The program will conclude with tours of Core Research Laboratories, the Biomedical Library, and the departmental research facilities in the Basic Medical Sciences Building.

For information about the Ph.D. Basic Medical Sciences Graduate Program and/or the Research Forum, contact the Graduate Office at 460-6153 (CSAB 241).

21ST ANNUAL MEETING OF THE NATIONAL SICKLE CELL DISEASE PROGRAM

The University of South Alabama Comprehensive Sickle Cell Center will host the 21st Annual Meeting of the National Sickle Cell Disease Program. The meeting will be held at the Mobile Convention Center March 6 through 9, 1996.

One thousand registrants including researchers, physicians, nurses, and other health care professionals involved in the treatment and care of patients with sickle cell disease are expected to attend. The meeting draws together the leading scientists who are working toward a cure for a genetic disorder which affects a large number of our nations' children and adults.

Dr. Steven R. Goodman, Director- USA Comprehensive Sickle Cell Center, has chaired the Steering Committee which has developed an exciting scientific and social program. Dr. Claude Lenfant, Director of the National Heart, Lung and Blood Institute will open the meeting and Dr. Y.W. Kan will give the Roland Scott Keynote Lecture. Dr. Kan is the Louis K. Diamond Professor of Hematology at the University of California, San Francisco and a member of the National Academy of Science. If you are interested in attending the scientific sessions of this meeting, Dr. Goodman at 460-7334 (CSAB 138) for further information.

USA AWARDED GRANT TO EXTEND ACCESS TO HEALTH INFORMATION NETWORK

The University of South Alabama has been awarded a $224,744 grant from the U.S. Department of Commerce that will extend access to its health information network to three federally qualified health centers at 11 locations throughout Mobile County. Centers to be networked with the USA health care system include four locations of the Mobile County Health Department, five locations of Franklin Memorial Primary Health Center and two locations of Mostellar Medical Center. All USA physicians will also be linked with the network.

The goal of the project is to improve the delivery of health care to the community's medically indigent population including children, pregnant women and Medicaid patients. It will provide physicians at the health centers on-line access to medical information available from USA's three hospitals, primary and specialty physicians and USA biomedical libraries. Health care partners in the grant have historically provided over 95 percent of Medicaid and indigent care in Mobile County. Coordinating health information will have several benefits.

"Coordinated information will ultimately result in better and more efficient care for the patient," said Jim Kotis, manager of medical systems planning and development. "Doctors will have access to medical information that could save diagnostic time and money by eliminating duplication of costly tests and time consuming delays in providing treatment."

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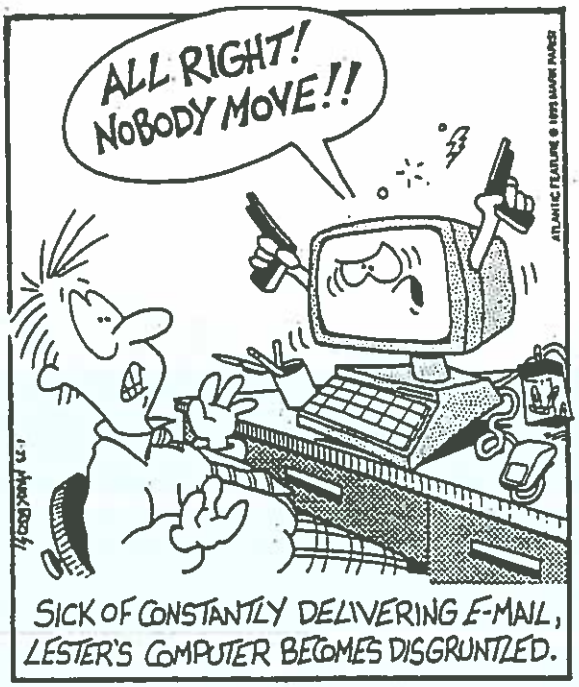
The federal grant will cover approximately 40 percent of the total cost of the project estimated to be $594,949. The grant is provided through the Telecommunications and Information Assistance Infrastructure Assistance Program of the U.S. Commerce Department. *(Reprinted, Midweek Memo, 11/30/95)*



NEW CARDIAC CARE UNIT AT USA MEDICAL CENTER

The University of South Alabama Medical Center has increased its capacity in caring for cardiac patients with the opening of the new cardiac unit on the ninth floor. The new unit increases the number of cardiac care beds to ten and includes state-of-the-art monitoring and communication equipment to improve patient care and facilitate caregiving.

"Cardiac patients are often more alert than other critical care patients," noted Doug Oliver, nurse manager for the CCU. "They are much more aware of their surroundings and need less noise stimuli than other acute patients." Oliver says the unit was specifically designed to offer a quiet environment for the recovering patient and admits many features were put in with the caregiver as well as the patient in mind.

The unit has every possible hookup needed for patient care built right into the wall, including enough electrical outlets to handle current technology and any new technology that becomes available in the future. Each private room has its own two-way intercom to the nurses' desks and a separate system to the telemetry personnel who monitor patient vital signs 24 hours a day. Closed circuit cameras will also give telemetry personnel visual contact with patients, providing the nursing staff with yet another set of eyes for patient care.

"The staff at USA Medical Center has always provided the best possible care for cardiac patients," said Oliver. "The new unit now provides a more efficient and pleasant atmosphere in which to work and recover."

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New Faculty Members


Agaliotis


Beals


Brandon


Carnahn


Greiner


Jinks


Mowry


Mull


Nesbitt


Scorpio

Dimitrios Agaliotis, M.D., (*Assistant Professor of Medicine*) received a M.D. from The National and Capodistrain University of Athens, Greece. He completed residency training in internal medicine at Catholic University of Louvain, Belgium and the University of South Florida, and a hematology/oncology fellowship with training in bone marrow transplantation at the University of Florida.

Daniel Beals, M.D., (*Assistant Professor of Surgery and Pediatrics*) received a B.S. in Biology and Chemistry from Carson-Newman College and a M.D. from Tulane Medical School. He completed an internship and residency in general surgery at Marshall University Affiliated Hospitals and fellowships in pediatric surgery/critical care at Boston Children's Hospital and Miami Children's Hospital.

Jeffrey Brandon, M.D., (*Associate Professor and Vice-Chair of Radiology*) received a B.S. in Biology from Allegheny College and a M.D. from Jefferson Medical College in Philadelphia, PA. He completed an internship and residency in general surgery at Bryn Mawr Hospital. He also completed a residency in diagnostic radiology and a fellowship in interventional/abdominal imaging at Hahnemann University Hospital.

Gary Carnahn, M.D., (*Assistant Professor of Pathology*) received a B.A. in Chemistry from David Lipscomb University and a Ph.D. in Biochemistry and M.D. from Vanderbilt University. He completed an internship in internal medicine and a thrombosis and hemostasis fellowship from Vanderbilt University. He also completed a residency in medicine and pathology at Washington University School of Medicine and training in anatomic pathology from the University of Kentucky.

Francis Greiner, M.D., (*Assistant Professor of Radiology*) received a B.S. in chemistry from New Mexico Institute of Mining and Technology, a M.A. in chemistry from the University of Delaware and a M.D. from the Medical College of Virginia. He completed an internship in internal medicine from Albany Medical Center and a residency in radiology from SUNY at Buffalo. He also completed a fellowship in neuroradiology from University of New Mexico.

John Jinks, M.D., (*Assistant Professor of Anesthesiology*) received a B.S. in Biology from the University of Alabama and a M.D. from the University of South Alabama. He completed an internship in general surgery from Baptist Medical Center in Birmingham and a residency in anesthesiology from Vanderbilt University Medical Center.

R. Gordon Mowry, M.D., (*Assistant Professor of Medicine*) received a B.S. in Biology from Eckerd College and a M.D. from the University of Alabama. He completed an internship in internal medicine from the University of Florida and a residency from the University of Arizona. He also completed a Mohs Micrographic Surgery fellowship and a residency in dermatology from the University of Alabama at Birmingham Medical Center.

David Mull, M.D., (*Assistant Professor of Surgery*) received a combined B.S./M.D. degree from the University of Missouri at Kansas City. He completed general surgery and reconstructive surgery residencies at Louisiana State University and University of Louisville. He also completed a cardiovascular and thoracic surgery residency and transplant fellowship at the University of Texas Southwestern Medical Center in Dallas, Texas.

Lori Nesbitt, Pharm.D., (*Assistant Professor of Medicine*) received a B.S. in Pharmacy and a Pharm.D. from Purdue University. She completed a residency and fellowship in Psychopharmacology from the Medical University of South Carolina. Dr. Nesbitt is the Director of Clinical Investigation Services in the Department of Medicine.

Ronald Scorpio, M.D., (*Assistant Professor of Surgery and Pediatrics*) received a B.S. in Engineering Science and a M.E. in Chemical Engineering from the University of Virginia. He received his M.D. degree from Eastern Virginia Medical School. He completed an internship and residency at Rhode Island Hospital, Brown University, Good Samaritan Hospital and the University of Cincinnati in general surgery and at Boston Children's Hospital and Harvard University in pediatric surgery. He also completed fellowships in trauma/critical care at the University of Toronto and the University of Maryland.

CLINICAL INVESTIGATION SERVICES: CHANGING WITH CHANGING NEEDS

Health care reform has not only decreased reimbursement for health care services, but has also decreased the number of research dollars awarded to individual investigators. Federal funding has never been more difficult to obtain than now. Thus, supplementing national funding efforts with pharmaceutical industry dollars is currently accepted within the scientific community as a viable option for new researchers as well as established investigators applying for the competitive national grant awards. In fact, many clinicians now recognize clinical trials as a timely and cost-effective way to offer new treatments to their patients.

While financially and often clinically worthwhile, drawbacks to involvement in pharmaceutical company funded clinical research have been expressed by our faculty. These drawbacks include lack of scientific interest or merit to the principal investigator, too time costly, difficulties in patient recruitment and when applicable, suboptimal coordinated efforts between the clinical investigation service and the principal investigator.

Clinical Investigation Services in the Department of Internal Medicine has undergone major transitions in the last few months in order to address the above concerns. These changes not only include new management, staff, goals and objectives but also new philosophies and approaches to clinical research.

Services provided by Clinical Investigation

The center consists of a director, medical director, a pharmacist, three research nurse/study coordinators, two research assistants and a regulatory affairs specialist. The office is located in the Health Services Building, Suite 1400. Clinical Investigation Services can provide all levels of research support for clinical trials. For example, the center is now equipped for ambulatory studies as well as inpatient clinical trials requiring 24 hour call. Traditional services include routine nursing care, regulatory documentation, case report form completion, interaction with study monitors, patient recruitment and scheduling of appointments, medication dispensing, etc. However, the staff is flexible and ready to meet new needs and challenges.

Goal and Objectives

The first goal of Clinical Investigation is to manage the operations more efficiently. Hopefully, by quickly realizing this goal, the service provided by the center will be seen as valuable to all clinicians in the College of Medicine. More specifically, the Clinical Investigation Services is committed to improving communication with the investigator, beginning with budget negotiations prior to study approval. Also, we plan to increase patient recruitment and retention by improved networking with referral physicians and when appropriate, advertising in a cost-efficient manner. In short, more is not always better in becoming value driven.

Secondly, the center is dedicated to working with investigators in all disciplines of medicine. Given that the center has a full research staff, their involvement relieves the investigators from a large time commitment which detracts from clinical practice, teaching and other research endeavors. The center is also available for new investigators because an independent research staff is not always cost-effective.

Thirdly, the center will bring more scientifically stimulating research to our institution. This will be done through communication with the pharmaceutical industry at the Phase I and II level. Participating in early phases of clinical trials will enable USA to have early information of new medications and technologies, which in some cases can potentially benefit the patients at an earlier date.

Lastly, it is the goal of the Clinical Investigation Services to expand its operation to successfully match new clinical trials awarded internally with physicians having special interest or expertise in the area. Hopefully, this will ensure a more coordinated effort in clinical research. Also, this may be an avenue in which an investigator can answer a research question of personal interest by simply writing an add-on to the protocol.

Future directions for clinical research

In order to be competitive within the clinical trials market, the Clinical Investigation Service will make some additional changes in the near future. These changes include on-line access to clinical trials information, 24 hour patient care services, Phase I trial capabilities and increased in-patient protocols. They are also very interested in working with investigators who have funding from non-pharmaceutical company sources.

In addition, as part of the commitment to education, clinical rotations for medical, nursing and pharmacy students are provided. This rotation will teach students about research design and methodology, following clinical research protocols and the clinical trials process. Hopefully by participating in a clinical trial, interest and ability to write a first grant will be realized for the new researcher interested in developing expertise and a successful career in clinical research.

If you would like to submit an article for publication, please forward it to:

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