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The Beat



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College of Medicine

JULY 1998

THE ESSENTIAL ROLE OF IRON

MARCEL CONRAD, M.D., professor of medicine and director of the division of hematology and oncology, has provided continuing contributions to the field of iron metabolism for the last 40 years and has over 250 publications relating to iron research. A million dollar Merit Award has been renewed for the next three years to identify the mechanisms involved in the absorption of iron and other metals, and the transport of these metals in cells. The award is funded through the National Institutes of Health and requires that the research proposal be ranked in the upper two percent of approved NIH grants.

Iron is vital for all living organisms because it is essential for multiple metabolic processes to include oxygen transport, DNA synthesis and electron transport. Too little iron leads to iron deficiency anemia with significant impairment of the capability to perform physical work. Excess iron produces tissue damage from free radical formation and has been associated with the aging process, myocardial infarctions, stroke, cancer, diabetes and even alzheimer's disease and parkinsonism. Thus, iron balance in the body must be carefully regulated because consistent alterations of iron equilibrium produces either iron deficiency or siderosis (iron overloading).

Regulation is accomplished largely in the proximal small intestine via the process of absorption. This is accomplished by transport proteins which not only facilitate iron uptake from food but bind the iron so that it is unavailable for "free radical formation" and damage to tissues. Over the last twelve years, the laboratories of the Division of Hematology and Oncology headed by Dr. Conrad have been funded by the National Institutes of Health to identify and characterize these iron binding proteins.

This research shows that mucins in the stomach bind iron at acid pH so that the iron remains soluble when it enters the more alkaline duodenum and is available for absorption. Uptake of iron by intestinal cells is facilitated by a transmembrane protein (β_3 integrin) in combination with a cytosolic protein that docks on the intracellular end of the integrin.

This protein was called mobilferrin, naming it after the city of discovery as well as characterizing it as the probable shuttle protein that safely transports iron through the cytoplasm. A large protein complex was also identified which contained integrin, mobilferrin and a flavin monooxygenase (paraferritin). This complex appeared to be important because it facilitated the reduction of the ferric iron to the ferrous state so that it could be utilized for the production of iron containing proteins by the cell. The initial research goals of the group were to explain the absorptive process.

However, more recent studies have shown that the mobilferrin-integrin-paraferritin system is operative in cells in other organs in the body and in these organs is responsible for receiving iron from transferrin which transports iron through the plasma. During the last year, two teams at Harvard independently demonstrated an alternate pathway (Nramp2). This pathway appears to operate under different conditions than the mobilferrin integrin pathway. Presently, comparative studies are in progress to define the role of each of these pathways in iron metabolism.

This research is a collaborative and interdisciplinary effort involving protein biochemistry, immunology, molecular biology and radioisotopic methods in order to achieve the desired goals. This is accomplished as a team effort involving Dr. Marcel Conrad, Dr. Jay Umbreit, Elizabeth Moore, Bryan Halloran and the fellows in both the Division of Hematology and Oncology and the Division of Gastroenterology. Thus, the research has been useful not only for its discoveries but also as a means of training young physicians in the way of research.

Dr. Conrad has worked in research laboratories since the age of fourteen. Throughout his career, he has remained dedicated to both fundamental research and clinical care. The major importance stems from inquisitiveness and the reward of discovering something novel which has relevance to human biology. Continued association with patients is useful in maintaining the relevance of the research.

Dr. Conrad was recently informed that he was again selected by his peers to be identified in the listing of *The Best Doctors In America*. This publication recognizes physicians for their superior clinical abilities and is widely regarded as the preeminent listing of its kind in the country. The merit award from NIH reflects his many significant contributions in science as well.

INSIDE:

USA Clinical Trials

Health Services Grants Development

1998 Residency Appointments

Children's Research Fund



USA CLINICAL TRIALS GOES ONLINE

An online resource has been established for USA College of Medicine Clinical Trials. This electronic version contains a searchable database with descriptions of currently approved and active clinical research projects in the College of Medicine. The database provides information on the drug or type of treatment being tested, specific medical eligibility, a project description, and contact/referral information. These studies are also accessible by departments and by principal investigator. The web site can be used to find a variety of information related to clinical trials and is designed as a resource tool for both patients and physicians alike.

There are many kinds of clinical trials and range from ways to prevent, detect, diagnose and treat various diseases to studies that improve the patient's comfort and quality of life. Each clinical study attempts to increase medical knowledge and to find new and better ways to help patients with various medical conditions.

To learn more about clinical studies conducted at the USA College of Medicine, visit the USA Clinical Trials homepage at <http://southmed.usouthal.edu/com/trials/>

BENOIT NAMED PRESIDENT-ELECT OF USA CHAPTER OF SIGMA XI



Joseph N. Benoit, Ph.D., Associate Professor of Physiology, has been voted President-Elect of the University of South Alabama Chapter of Sigma Xi. The Scientific Research Society, Sigma Xi, is comprised of a membership of more than 90,000 scientists and engineers worldwide who were elected to membership because of their research achievements. The USA Chapter of Sigma Xi represents one of over 500 chapters at

universities and colleges, government and industrial laboratories. The society publishes the *American Scientist*, funds research for young investigators and sponsors a variety of programs in the areas of science education, science policy and the public understanding of science. The USA Chapter sponsors monthly research colloquia from September to May and co-sponsors the annual USA Research Forum. Nominations for membership are open to all scientists and engineers on the USA campus. Please contact Dr. Benoit for information about the USA chapter. Additional information about Sigma Xi can be obtained from their website at www.sigmaxi.org

INTERNATIONAL EFFORTS

Dr. Wladimir Wertelecki, chair and professor of the Department of Medical Genetics, led a panel of local and national experts on a trip to the Ukraine in April. The group promoted birth defects surveillance and prevention in the country.

Ukraine's Minister of Health and the Mohyla University in Kiev hosted the group delegations. In addition, the United States Agency of International Development is considering a proposal from Mobile doctors to establish a birth defects prevention program in Ukraine.



Dr. Richard L. Wesenberg, professor of radiology and pediatrics, was a visiting professor and consultant pediatric radiologist at the King Faisal Specialist Hospital and Research Centre in Riyadh, Saudi Arabia.

The hospital specializes in pediatric cardiac surgery and pediatric oncology and hematology. Wesenberg worked with a group of 20 radiologists from around the world and presented a series of lectures and conferences on pediatric imaging to the radiology and pediatric departments.

COLLEGE OF MEDICINE ESTABLISHES OFFICE OF HEALTH SERVICES GRANTS DEVELOPMENT



The College of Medicine has established the Office of Health Services Grants Development (HSGD) to assist faculty and administrators throughout the USA health system in planning, developing and preparing grant proposals for submission to federal, state and private funders in the area of health care service delivery.

Ms. Teresa S. Swartz has been appointed to head up this effort. Ms. Swartz has more than fifteen years experience in the field of health and human services, with a strong grants development background in the field of public health. Swartz is experienced in clinical operations as well, having managed the clinical operations of the Mobile County Mobile County Health Department for five years. Prior to her appointment to the College of Medicine, Swartz directed a similar grants development effort, the Community Grants Development Program, for the Office of Sponsored Programs at the University.

According to Swartz, the establishment of this new office strengthens the University's commitment to community health in the Mobile area. "We expect to pursue innovative health care delivery projects that will improve access to high quality health care for all residents of southwest Alabama. In order to do this, we will forge new and strengthen existing relationships with an array of community-based health and human service providers."

Ms. Swartz is available to investigate and evaluate grant opportunities and prepare materials necessary to create competitive health care delivery grant proposals. Her office will develop and maintain information on current community health needs, identify sources of public/private funding mechanisms, and assist the COM with the preparation of research reports and studies necessary to the development of specific grant proposals.

If you have any questions regarding the Office of Health Services Grants Development or if you need assistance with a specific project, please contact Teresa Swartz at 461-1510 or CSAB 140.

'DATELINE' FEATURES USA STROKE CENTER

The USA Stroke Center was featured on April 21, 1998 in a Dateline NBC report about stroke treatment. The program focused on the use of t-PA (Tissue Plasminogen Activator), a clot-busting drug used in the acute treatment of strokes. The Stroke Center has been administering t-PA to all eligible stroke patients.

"Dateline" interviewed Dr. Richard Zweifel, assistant professor of neurology and director of the USA Stroke Center, and followed the progress of one of his treated patients.

For more information on t-PA and its use for stroke treatment, contact the USA Stroke Center at (334) 470-5801.

USA COMPREHENSIVE SICKLE CELL CENTER RECEIVES SIX MILLION DOLLAR GRANT AWARD

Dr. Steven R. Goodman, the Principal Investigator and Director of the USA Comprehensive Sickle Cell Center, has recently received an award statement from the NIH indicating the USA Center will be funded for the period April 1 1998 - March 31, 2003. During this five year cycle the Center will receive approximately \$6 million from the federal government. The Center also receives approximately 250 thousand dollars a year from the State of Alabama as part of the annual Sickle Cell Education bill.

The USA Sickle Cell Center first received support in 1988. The award represents the third consecutive successful grant application from USA to support our Sickle Cell Center and is one of only ten centers in the United States who have received such a grant award.

The NIH Sickle Cell Center award is primarily intended to support sickle cell research. The current research projects and project heads, supported by the NIH award are: "Novel Mechanism for Globin Gene Silencing During Alternate Lineage Commitment" (Betty S. Pace, M.D.), "The Molecular Defect(s) within the Spectrin Membrane Skeleton of Irreversibly Sickled Cells" (Steven R. Goodman, Ph.D.), "Mechanisms for Fetal Hemoglobin Induction" (Danna Zimmer, Ph.D.), "Acute Lung Injury in Sickle Cell Disease" (Johnson Haynes, M.D.)

In addition to the research projects, the NIH mandates that the center support projects that provide sickle cell education and community support. The two funded support projects and project heads are: "Education of Health Professionals" (Johnson Haynes, M.D.), and "Programs for Individuals with Sickle Cell Disease to Promote Positive Outcomes" (Rose Peterson). Dr. Goodman stated "this Sickle Cell Center provides valuable clinical and psychosocial services to the City of Mobile, the State of Alabama, and the entire Gulf Coast region.

In addition, the research being performed at USA has the potential to benefit sickle cell patients worldwide with better treatments and ultimately a cure for this genetic disease. I am honored to have the opportunity to take part in such an important undertaking. I hope that the entire University community appreciates and takes pride in the work being done by the faculty and staff of the USA Comprehensive Sickle Cell Center."

USA CHILDREN'S RESEARCH FUND

The USA Children's Research Fund is granting one \$12,000/year award for research projects involving health problems or issues affecting children. These funds have become available as a result of participation in the Children's Miracle Network. Recipient must be a full-time faculty member with a primary appointment in a clinical department of the USA College of Medicine. Projects to be considered can be clinical or fundamental/basic science in nature.

For additional information contact the Department of Pediatrics at 434-3919.

NEW Ph.D. GRADUATES IN BASIC MEDICAL SCIENCES

Five recent graduates bring the total number of graduates of the College of Medicine's Ph.D. program to one-hundred three. Students were first accepted into the program in 1979; the initial group of graduates occurred in 1983. The most recent graduates are:



Aimee Leigh Landar, sponsored by Dr. Danna Zimmer in the Department of Pharmacology. Aimee's dissertation was entitled "Molecular Mechanisms of S100A1-Target Protein Interaction."



Scott McGuirt, sponsored by Dr. Jeffery Ardell in the Department of Physiology. Scott's dissertation was entitled "Functional Capacity of the Intrinsic Cardiac Nervous System to Modulate Regional Cardiac Function: Autonomic and Humoral Influences."



Philip D. Reynolds, sponsored by Dr. Jonathan Scammell in the Department of Pharmacology. Philip's dissertation was entitled "The Molecular Basis of Glucocorticoid Resistance in the Squirrel Monkey *Saimiri boliviensis boliviensis*."



Peter S. Wilson, sponsored by Dr. Aubrey Taylor in the Department of Physiology. Peter's dissertation was entitled "The Relationship Between Shear Stress, Pulmonary Vascular Responsiveness to Nitric Oxide, and Perfusate Cyclic GMP Concentration in Isolated Rat Lungs."



Zhuang Zuo, sponsored by Dr. Richard Honkanen in the Department of Biochemistry and Molecular Biology. Zhuang's dissertation was entitled "A Study of the Cellular Roles of Serine and Threonine Protein Phosphatase Type 5."

CONGRATULATIONS.....

The University of South Alabama College of Medicine was recently honored by the American Academy of Family Physicians (AAFP) for its efforts to make family practice a top career choice for graduating seniors.

Dr. Perry Dickinson, professor of Family Practice and Director of Educational Programs for the USA Department of Family Practice and Community Medicine, said, "we're pleased to see such a good number of our graduates choose to enter family practice in keeping with the needs of the state."

The seventh annual "Family Practice Percentage Award" was presented to the College of Medicine during the conference of the Society of Teachers of Family Medicine in Chicago. USA was one of 46 medical colleges nationwide recognized for educating and motivating students to choose a career as a family physician.

The Silver Achievement Award was presented to the College of Medicine, recognizing that 25-29.9 percent of graduates entered a family practice residency program over a three year period. 28.6 percent of USA graduates entered a family practice residency training program from 1995-1997.



*Left is Norman B. Khan, M.D. director of the Division of Education of the American Academy of Family Physicians
Right is W. Perry Dickinson, M.D., professor of Family Practice*

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

Dusty Layton
University of South Alabama
College of Medicine
CSAB 170

or
FAX (334) 460-6073

Visit "The Beat" at
<http://southmed.usouthal.edu/com/thebeat.htm>

AMERICAN HEART ASSOCIATION AWARDS RESEARCH GRANTS

The Southeast Affiliate (Georgia, Tennessee and Alabama) of the American Heart Association has granted the following research awards and postdoctoral fellowships:

Grant-In-Aid Awards:

Donna L. Dyess, M.D., associate professor of surgery, grant project entitled "Peripheral Microvascular Permeability Response to Autocoids in Heart Failure: Role of Catecholamines and Prostanoids."



James W. Gaubatz, Ph.D., associate professor of biochemistry and molecular biology, grant project entitled "Dietary Mutagens and DNA Damage in Cardiac Myocytes."



James C. Parker, Ph.D., professor of physiology, grant project entitled "Mechanical Ventilation Induced Lung Injury."



L. Britt Wilson, assistant professor of physiology, grant project entitled "Role of Substance P in the Afferent Collaterals Mediating the Pressor Reflex to Static Contraction."

Postdoctoral Fellowships:

Jason D. Gardner, Ph.D., received a Ph.D. degree in biomedical engineering at Louisiana Tech University and is currently working in the laboratory of Dr. Joseph Benoit, associate professor of physiology.



Anne-Marie McMahon, Ph.D., received a Ph.D. degree in anatomy and physiology at Flinders University in Australia and works under the direction of Dr. Joseph Benoit, associate professor of physiology.

American Heart
AssociationSM
*Fighting Heart Disease
and Stroke*



HONORS CONVOCATION AWARDS

- Dean's Award W. Allen Goodson
Patrick W. Lett, Christopher Poole, Richard Spiro, Jason C. Swanner
Award to the graduating senior who has accumulated the highest scholastic grade point average for the full four years of medical school.
- Merck Award in Ophthalmology Jason C. Swanner
Awarded to the graduating medical student, selected by the Ophthalmology faculty, who demonstrated both an interest in ophthalmology and best exemplified our ideal of competent and compassionate patient care.
- Pharmacology Achievement Award Reginald M. Smith
The award is designed to recognize outstanding student performance in Pharmacology.
- Neurology Award Reginald M. Smith
Awarded by the Department of Neurology to a senior student who has shown excellence in clinical neuroscience.
- Community Service Award Reginald M. Smith
This award is presented by the Mobile County Medical Society to a senior whose classmates believe best fulfills the ideals of humanitarian public service as demonstrated by superior awareness of, and achievement in, civic and community programs.
- Honors Award in Biochemistry W. Allen Goodson
Awarded to a student who excelled in all aspects of the Medical Biochemistry course.
- John W. Donald Memorial Award in Surgery Richard M. Spiro
Awarded to the senior student who best demonstrated clinical and academic excellence in the surgery clerkship.
- Hollis J. Wiseman Award Richard M. Spiro
for Excellence in Pediatrics
Presented to the student who best exemplified Dr. Wiseman's outstanding scholarship, compassion for patients and families, involvement in the profession and community, enthusiasm for exploration and steadfast love of family, friends and colleagues.
- Obstetrics/ Gynecology Award Matthew W. Wise
Presented to the graduating medical student who, through scholarship, patient care, interaction with faculty and house staff, and motivation, has demonstrated excellence in Obstetrics and Gynecology.
- Outstanding Student in the Anatomical Sciences Phillip T. Burch
Awarded by the faculty of the Department of Structural and Cellular Biology to the student with the best performance in the four anatomical science courses.
- Charles W. Urschel Achievement Award Phillip T. Burch
in Physiology
Awarded to a graduating senior for outstanding performance in the Physiology course and/or Physiology research.
- Family Practice and Jennifer G. Miley
Community Medicine Student Award
Awarded by the faculty of the Department of Family Practice and Community Medicine to the graduating senior student who shows the greatest potential as a future family physician. The selection is based on the student's broad general medical knowledge and clinical skills; demonstration of concern for the physical, emotional and social well-being of the patients; and understanding of concepts central to family medicine.
- Pathology Award Uneeda M. Leverett
Given jointly by the Alabama Association of Pathologists and the University of South Alabama Department of Pathology faculty and residents for excellence in Pathology.
- Forensic Science Award Uneeda M. Leverett
Awarded by the Alabama Department of Forensic Sciences to a senior medical student who, through working with the Department, has provided outstanding services to the citizens of Alabama.
- Merck Award William D. Jones
Robert I. Oliver, Jr.
Awarded by vote of the faculty to senior students with superior academic achievement.
- Excellence in Emergency Medicine John A. Kreisberg
The excellence in Emergency Medicine award is given by the faculty of the Department of Emergency Medicine and the Society of Academic Emergency Medicine to the student demonstrating outstanding clinical skills and proficiency in Emergency Medicine.
- Medical Alumni Leadership Award Julianne T. Sneckenberger
Awarded to a senior student, by vote of classmates, in recognition of outstanding leadership of the graduating class.
- Samuel Eichold Award Amy R. Woods
Presented to the graduating medical student who through scholarship, patient care, interaction with faculty and housestaff, and motivation has demonstrated outstanding achievement in Internal Medicine.
- SNMA Leadership Award Anna E. Harvey
Awarded by the Student National Medical Association to a graduating senior who has demonstrated outstanding community, school and organizational service and leadership qualities.
- Lange Award D. Scott Smith
Awarded by vote of the faculty to a senior student with superior academic achievement.
- Mutual Assurance Award Vincent W. Gardner
This award is presented to a senior medical student who plans to remain in Alabama for residency and who excels in patient communication.

The Class of 1998 Residency Appointments

Anesthesiology

Douglas S. Feinstein (1999)

University of California at San Diego, California

Family Practice

Deborah E. Booher

University of South Alabama Medical Center, Alabama

Albert R. Boroughs, IV

UAH/Huntsville Hospital, Alabama

Darin S. Brown

University of South Alabama Medical Center, Alabama

Troy A. Clifton

Medical Center of Columbus, Georgia

Kurtis W. Eaton

University of South Alabama Medical Center, Alabama

Sharon Denise Gray

Tuscaloosa Family Practice, Alabama

Delphine D. Head

Morehouse School of Medicine, Georgia

William D. Jones

Latrobe Area Hospital, Pennsylvania

William K. Korn

University of Tennessee College of Medicine, Tennessee

Jennifer G. Miley

University of South Alabama Medical Center, Alabama

Jonathon R. Munoz

Montgomery Family Medicine, Alabama

Reginald M. Smith

University of Tennessee, Tennessee

Internal Medicine

Kathlyn L. Diefenderfer

University Hospital, Mississippi

Robert S. Guerzon

Keesler AFB Medical Center, Mississippi

Susan E. Jones

University Hospital, Mississippi

Preeti Kansal

Rush-Presbyterian- St. Lukes, Illinois

Mir A. Khan

Tulane University, Louisiana

John A. Kreisberg

University of South Alabama Medical Center, Alabama

William B. Lamar, III

University of South Alabama Medical Center, Alabama

Gregory H. Nguyenduc

University of Texas in San Antonio, Texas

Peter T. Petrucci, Jr.

Carraway Methodist Medical Center, Alabama

Christopher V. Poole

University of Alabama, Alabama

Lesa L. Proctor

Carraway Methodist Medical Center, Alabama

Patrick F. Reilly

Medical University of South Carolina, South Carolina

Michael K. Sanders

University of Alabama, Alabama

David S. Smith

Vanderbilt University, Tennessee

Bryan F. Thompson

University of Alabama, Alabama

Amy R. Woods

University of South Alabama Medical Center, Alabama

Medicine/Pediatrics

Jennifer M. Gray

Michigan State University, Michigan

Tsun Sheng Neil Ku

University of Arkansas, Arkansas

Fiona I. Wilson Masters

University of Utah, Utah

Lynne A. McDonnell

University of South Alabama Medical Center, Alabama

Charles A. Wood, Jr.

University of South Alabama Medical Center, Alabama

Neurological Surgery

Richard M. Spiro

University of Pittsburgh, Pennsylvania

Obstetrics/Gynecology

Alison Abercrombie-Heaton

Indiana University, Indiana

Laura S. Finger

University of South Alabama Medical Center, Alabama

Uneceda M. Leverett

University of South Alabama Medical Center, Alabama

Micheal C. O'Toole

St. Johns Mercy Medical Center, Missouri

Julianne T. Sneckenberger

University of Tennessee, Tennessee

1998 Residency Appointments (*continued*)

Ophthalmology

Jason C. Swanner (1999) University of Alabama, Alabama
Andrew J. Velazquez (1999) University of Florida, Florida

Orthopaedics

Jeffrey M. Conrad Medical University of South Carolina, South Carolina
Wayne A. Goodson Mayo Graduate School of Medicine, Minnesota
Patrick W. Lett Mayo Graduate School of Medicine, Minnesota

Pediatrics

Gwynetta M. Collins University of Arkansas, Arkansas
Lucille A. Ferrante Tulane University, Louisiana
Anna E. Harvey Central Texas Medical Foundation, Texas
Paul A. Miranda University of Tennessee, Tennessee
Karen J. Parsell University of South Alabama Medical Center, Alabama
Michael A. Russo University of Arkansas, Arkansas
Leslie M. Treece East Tennessee State University, Tennessee
Tamara V. Walker University of South Alabama Medical Center, Alabama

Psychiatry

Lorna J. Bland University of South Alabama Medical Center, Alabama

Preliminary Internal Medicine

Elizabeth L. O'Connor Medical College of Virginia, Virginia

Preliminary Surgery

James M. Harrison Alton Ochsner Foundation, Louisiana

Radiology

Christopher J. Sneckenberger University of Tennessee, Tennessee

Surgery

Phillip T. Burch University of Louisville, Kentucky
Dennis L. Fernandez Alton Ochsner Foundation, Louisiana
Vincent W. Gardner Baptist Health System, Alabama
Robert I. Oliver, Jr. University of Louisville, Kentucky
Matthew W. Wise Louisiana State University at New Orleans, Louisiana

Undersea Medicine

Timothy P. Zinkus Balboa USN Medical Center, California

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