

ADVANCE

ADVANCING RESEARCH FROM LAB TO LIFE

A Biannual Research Digest of the University of Tennessee Medical Center and UT Graduate School of Medicine

CANCER, OBESITY, HEART DISEASE:

Using
Research
to Improve
Healthcare
Together

ON THE HORIZON:

Solving the Mystery of Sudden
Cardiac Death in Athletes

RESEARCH SPOTLIGHT:

Seeking Success for Patients of
Bariatric Surgery

STUDIES IN BRIEF:

- Affecting One of the World's Most Common Hereditary Diseases
- From Clinic to Lab...and Back: Melanoma Research

CLINICAL TRIALS

WINTER 2013



**SPIRIT OF
DISCOVERY...**

OBSERVATIONS

In January 2010, the state challenged the University of Tennessee to become a Top 25 public research university in a decade*, and the UT Graduate School of Medicine accepted this challenge, knowing that the journey will be as important as the end result. The improvements will

- Increase the quality and value of education
- Further develop our strengths in research
- Expand our contribution to economic growth and development
- Strengthen the University of Tennessee's flagship campus for the benefit of all Tennesseans.



In this issue of *Advance*, you will read about many exciting research endeavors by our faculty, residents, fellows and students. These efforts exemplify our commitment to improving our knowledge of diseases and how that knowledge can be applied to improve patient care and outcomes. In responding to the call to become a Top 25 public research institution, our challenge is to build upon our recognized strengths by expanding the existing expertise and infrastructure dedicated to outcomes-driven basic and clinical/applied research.

To that end, the Graduate School of Medicine must foster external collaborations not only with UT Knoxville but also with local industry and government and academic institutions outside of Tennessee. One such collaboration is the comparative research between the Graduate School of Medicine and UT College of Veterinary Medicine.

Advances in human and veterinary medicine are dependent on an overlapping collection of technologies and research discoveries. Healthy interactions between the Graduate School of Medicine and College of Veterinary Medicine already have benefitted both animal and human health. Our recent work with a radio-labeled fatty acid for myocardial PET/CT imaging in healthy cats can be directly applied to pet cats and humans with heart disease and diabetes. Another recent study of how the brains of healthy dogs utilize glucose will support future studies in animals and humans suffering from inflammatory brain diseases. These are examples of how collaboration can bring new insight to our research programs and better healthcare to patients of all walks of life.

This collaborative approach to research allows us to deepen and broaden our ongoing efforts to achieve the cutting edge of science and biomedical research, ultimately enhancing how we perform our daily tasks in research, teaching, service and patient care.

*For more information about the journey to the Top 25, visit <http://www.utk.edu/volvision-top25/about.php>.

Amy LeBlanc, D.V.M.

Associate Professor, Director, Translational Research

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ADVANCE

Issue 4: Winter 2013

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Advance is produced by the University of Tennessee Graduate School of Medicine. The mission of the digest is to spotlight research programs at the institution and explain how the work of our researchers impacts healthcare in East Tennessee and beyond.

Institutional Review Board
All research using human volunteers follow stringent federal regulations that require a review by an Institutional Review Board (IRB) before it is approved. The IRB committee is comprised of physicians, pharmacists, scientists, researchers and non-scientific community representatives. The members review research protocol to ensure protections are in place.

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Publication #R08-6350-001-008-13 (13PB12RS)

OSCAR GRANDAS:



He knew he wanted to be a specialist and that the social circumstances in Colombia would not allow him to achieve this, so Colombian-born Oscar Grandas, M.D., turned his gaze toward America. Grandas also heads the Vascular Research Laboratory to help women with vascular disease.

To say Oscar Grandas is resolute is nothing new to him. He says it, himself. Born and raised in Bogota, Colombia, Grandas states that Colombians are very entrepreneurial by nature, and in his career, Grandas has competed and excelled, using his inherent drive to his advantage and to the benefit of his patients. But there's more to this successful doctor and researcher.

The outpaced spirit of Grandas does not manifest in brashness. It's not showy or loud. He doesn't seek the spotlight and in fact is quick to turn it onto others.

Grandas is humble. What he achieves in the operating room and research lab is not only done with the constant hum of the determination to excel but also with a spirit of partnership and gratification, which he uses to help his patients.

Oscar H. Grandas, M.D., serves in many roles. He is an associate professor in the Department of Surgery, Division of Vascular/Transplant Surgery, and the director of the Transplant Center and Vascular Access Center at the University of Tennessee Medical Center. He also serves as the medical director of the Vascular Research Laboratory at the UT Graduate School of

Medicine. His work there started many years ago when he observed in some of his patients that hormone replacement therapy seemed to adversely affect bypass grafts and stent patency. He has spent years investigating this observation and is making a difference in the lives of many patients.

Getting to this point in his career, however, was not particularly easy. During his years in medical school at Universidad Nacional De Colombia, political turmoil, social instability, drug trafficking and violence were invading his homeland.

"One night while I was on duty, a bomb exploded near the hospital," Grandas recalls. "We cared for the victims of the attack throughout the night."

Nearing the end of medical school, Grandas

knew he wanted to be a surgeon, "but there were a very limited number of surgical residency positions in the country," he explains. He knew he had to leave.

His desire to become a specialist coupled with his country's instability "made leaving easier," he says. He accepted a surgical residency position at Washington Hospital Center in Washington, D.C., and upon completion of the first two

**I CAME HERE WITH TWO IDEAS:
LOOK INTO HORMONE REPLACEMENT
THERAPY AND INVESTIGATE
METALLOPROTEINASES....BOTH
STUDIES CAN LEAD TO IMPROVED
OUTCOMES FOR WOMEN WITH
VASCULAR DISEASE.**

-Oscar Grandas, M.D.

Surgeon and Researcher Investigates HRT

years as a preliminary surgical resident, he came to the Graduate School of Medicine to complete his general surgery residency. Still not enough for this driven doctor, he returned to D.C. for a fellowship in transplantation, then came back to the Graduate School of Medicine for yet another vascular surgery fellowship.

It was during his first stint in Washington that Oscar Grandas was first introduced to research.

“In Colombia, we greatly admire researchers,” he says, “but there are not many resources available to conduct basic science research in the country.”

In his general surgery residency in D.C., the chair of the department asked him to assist with shock research, and Grandas learned the value of basic science research. Later, as part of his vascular surgery fellowship at the Graduate School of Medicine, he was involved with several vascular biology research projects—research that would later play a major role in directing his career.

Once he completed his residencies and fellowships, Grandas, as a foreign national, was required to serve at a federally funded medical institution, so he worked at the Veterans Administration Hospital affiliated with the Medical College of Georgia. He served as a transplant surgeon and conducted research to discover more about immunology and tolerance in transplants.

“Research mentorship at the Institute of Molecular Immunology and Genetics was outstanding. Researchers taught me the tools of basic science research, and I’m very grateful to them for that,” Grandas says.

Two years later, Grandas had his own lab at the Veterans Administration Hospital. “I was researching dendritic cells found in early pregnancy and how they could help suppress the immune system and create tolerance in transplant patients,” he explains.

When his time in Georgia was complete,



Grandas knew where he wanted to settle down and continue practicing medicine and conducting research: UT Graduate School of Medicine.

“Dr. [Mitch] Goldman has been a tremendous influence on my career,” Grandas says of the assistant dean for Research and chair of the Department of Surgery. “I knew he would support research the way I wanted to do it. I needed to develop as a surgical scientist, and the opportunity was here.”

Plus, the research in vascular interventions he had conducted during the vascular surgery fellowship had remained in his mind, and he wanted to come back to see where it could lead.

“I came here with two ideas: Look into hormone replacement therapy and

investigate metalloproteinases,” Grandas says. “I wanted to partner with people who bring scientific knowledge to research and would help us consider what we can do with our ideas.”

Grandas partnered with Deidra Mountain, Ph.D., who now is the scientific director of the Vascular Research Laboratory, a basic and translational research facility at the Graduate School of Medicine. Together, they are investigating the role of hormone replacement therapy (HRT) in post-menopausal women who have undergone vascular interventions that have failed. Grandas also is looking at intimal hyperplasia, a thickening of the vascular walls, in women taking HRT. Both studies can lead to improved outcomes for women with vascular disease.

Grandas also mentors Ph.D. students and collaborates with organizations such as the Computational Sciences and Engineering Division of Oak Ridge National Laboratory and various departments at the University of Tennessee, Knoxville.

“I like to feel I’m contributing to discovery,” Grandas says. “I have gratification every day through my transplant and vascular surgery patients, and research is fulfilling, because it adds a different dimension to my career.” ▲

HELPING SURGERY

Researching the Connection between Bariatric



Matthew Mancini, M.D., Hollie Raynor, Ph.D., Greg Mancini, M.D., are collaborating on research to help patients who undergo bariatric surgery succeed.

More than one-third of American adults are obese.* Some people turn to bariatric surgery to help them lose weight and reclaim a higher quality of life, and new research examining food cravings led by two surgeons and a dietitian nutritionist is helping ensure their success.

Recently, Matthew Mancini, M.D., and Greg Mancini, M.D., associate professors in the Department of Surgery and co-directors of the Tennessee Weight Loss and Surgery Center at the University of Tennessee Medical Center, teamed with Hollie Raynor, Ph.D., R.D., L.D.N., an associate professor in the UT Department of Nutrition, to conduct a study to understand the psychology and biology of weight loss after bariatric surgery. The Mancinis are highly

skilled at performing the three types of bariatric (weight loss) surgery available today: Gastric bypass, laparoscopic adjustable gastric banding (lap band) and vertical sleeve gastrectomy. They realize, however, that a successful surgery does not always translate to weight loss.

“After surgery, if patients regain weight or don’t lose weight, we consider it a failure,” Greg Mancini says. “Our goal is to help our patients eliminate those failures, and that is why we are investigating ways beyond surgery to help them succeed.”

Losing weight after surgery requires drastic lifestyle changes, so the team’s research is examining cravings and other changes that might be important for understanding the effects of surgery on weight loss.

WHY THIS MATTERS:

OBESITY ROBS PEOPLE OF HEALTH AND QUALITY OF LIFE. UNDERSTANDING CRAVINGS AND OTHER BIOLOGICAL AND PSYCHOLOGICAL CHANGES AFTER BARIATRIC SURGERY CAN HELP PEOPLE SUCCEED WITH WEIGHT LOSS AND RECLAIM QUALITY OF LIFE.

SUCCEED:

Surgery and Cravings



The laparoscopic adjustable banding (lap band) is one option for bariatric surgery.

“We believe food cravings after weight loss surgery can shift dramatically and differently depending on the type of surgery a patient undergoes,” says Raynor. “We are analyzing patients’ selection and variety of foods consumed and trying to connect those to food cravings and changes in weight after surgery.”

Cravings before and after bariatric surgery can cause unhealthy eating patterns and undermine the effects of surgery. Similarly, greater dietary variety can contribute to disruption of satiation processes and cause overconsumption. The team’s research is investigating whether weight loss surgery influences changes in dietary variety and cravings and how the changes can predict weight loss.

Also of interest is understanding the biological changes in the body after surgery. The stomach and intestines produce hormones that affect behavior, including sensory taste experience. When the gut is surgically altered, the hormones that are produced also are changed, sometimes resulting in unexpected cravings and behaviors.

The research, which started in June 2011, will follow 90 patients from pre-surgery through the first year after surgery. The team believes preliminary findings will be submitted this spring.

“Results of the study should have significant clinical implications for postoperative dietary

recommendations, which often are vague and difficult for patients to understand and follow,” Raynor says. When physicians and patients understand and anticipate changes in dietary

variety and food cravings in relation to weight loss surgery, they can better manage dietary adherence.

“The more information we have about why surgeries do or do not work for our patients, the better we can help them,” Matthew Mancini says. “It doesn’t stop at the operating room door.”

Source: Centers for Disease Control and Prevention



**THE TEAM’S RESEARCH IS
EXAMINING CRAVINGS AND
OTHER CHANGES THAT
MIGHT BE IMPORTANT FOR
UNDERSTANDING THE EFFECTS
OF SURGERY ON WEIGHT LOSS.**

SUDDEN CARDIAC DEATH AND



Irfan Asif, M.D., is leading a study of sudden cardiac death in athletes.

Sudden cardiac death (SCD) is the leading cause of death of young athletes. It is caused by occult cardiovascular abnormalities that are exacerbated during vigorous exercise.

The paradoxical death of an apparently healthy young athlete understandably raises scrutiny regarding prevention strategies, so Irfan M. Asif, M.D., director of the Sports Medicine Program and an assistant professor in Family Medicine, is aggressively investigating SCD. His recent groundbreaking study with the National Collegiate Athletic Association (NCAA) was the first to report the rate of SCD in college athletes (1 in 40,000). More alarming was the rate of SCD in high-risk populations, such as NCAA male Division I basketball players, whose rate of SCD was found to be 1 in 3,000.

One part of his research focuses on defining the epidemiology of SCD, and results of a unique collaboration with Sophy Jesty, D.V.M., an assistant professor at the UT College of Veterinary Medicine, will help.

“We are trying to determine if vigorous exercise in endurance athletes, such as marathoners, can lead to subtle scar formation in the heart,” Asif explains. The team is testing cardiovascular activity during endurance exercise in a canine model. “Results would be some of the first to

understand potential mechanisms for cardiac arrest in distance athletes.”

Along with this causal research, Asif is establishing better protocols for screening athletes. Currently, the recommended protocol is limited to a history and physical exam.

“Studies show that the traditional method of screening is less than 33 percent effective in detecting occult cardiac disease in athletes,” says Asif. “Up to 80 percent of athletes who suffer cardiac arrest are asymptomatic with no warning signs of disease.”

Asif believes that adding an electrocardiogram (ECG)—a non-invasive test that shows electrical activity in the heart—to pre-participation athletic screening will identify many of the diseases associated with SCD. He is collaborating with Xiaopeng Zhao, Ph.D., an assistant professor in the UT College of Engineering, Mechanical, Aerospace and Biomedical Engineering, to improve ECG signal quality and design an algorithm for interpreting the ECG. This algorithm will immediately indicate if the

ND THE ROLE OF RESEARCH



equipment is being used incorrectly. “We are hoping to build a fail-safe mechanism to help make sure the ECG gives the athlete and doctor correct information,” Asif says.

Beyond the clinical process of pre-participation screenings, Asif is working with Jeffrey Fairbrother, Ph.D., Leslee Fisher, Ph.D., and Rebecca Zakrajsek, Ph.D., in the UT Department of Kinesiology, Recreation and Sports Studies, to determine the psychological impact on athletes who have screenings that include ECG. These athletes currently report that if screened they feel safer and more confident while playing sports.

Despite the best efforts of screening, however, cases of cardiac arrest in athletes could occur. Thus, Asif also is advocating for more automatic external defibrillators (AED) and coordinated emergency action plans at sporting venues.

His research is making an impact in the world of sports. He recently presented his findings and recommendations as the U.S. representative at a meeting of the Spanish Olympic Committee, and his work has won numerous national awards:

- American Medical Society for Sports Medicine (AMSSM) Best Overall Research Award (2010)
- AMSSM Harry Galanty Most Outstanding Young Investigator Award (2011, 2012)
- Society of Teachers of Family Medicine Best Overall Research Paper (2012).

But more importantly, Dr. Asif’s work can save the lives of athletes. ▲

ENERGY DRINKS AND ATHLETES

Energy drinks and questions about their potential dangers recently have made headlines. Irfan M. Asif, M.D., who is leading a comprehensive study on sudden cardiac death in athletes believes energy drinks consumed in excess can, indeed, be harmful.

“Energy drinks alter the perceived level of exertion and lengthen the time to exhaustion,” Asif says.



He believes stimulants and other substances in the drinks can trigger an arrhythmia if used in excess, particularly if the consumer has an unknown abnormality of the heart.

“For people who are physically active, overly consuming energy drinks could exacerbate an occult abnormality to a more noticeable degree,” he says.

For more information, speak with your sports medicine or primary care physician.

WHY THIS MATTERS:

THIS YEAR, MORE THAN 150 YOUNG ATHLETES WILL DIE WHILE ENGAGING IN ACTIVITIES THAT ARE OTHERWISE HEALTHY. UNDERSTANDING THE CAUSES OF SUDDEN CARDIAC DEATH, IMPROVING THE PRE-PARTICIPATION SCREENING PROTOCOL FOR ATHLETES AND BEING PREPARED WITH AN EMERGENCY PLAN THAT UTILIZES AN AED WILL SAVE LIVES.

CLINICAL TRIALS: THERAPEUTIC AND DIAGNOSTIC

Clinical trials typically provide therapeutic solutions. At the UT Graduate School of Medicine, for example, clinical trials have helped bring new treatments to cancer patients, including Avastin® and tamoxifen; new imaging technology for patients with amyloid disease; and improved vascular grafts for trauma patients.

Clinical trials also can be diagnostic investigations or translational research studies. These trials seek to determine causes, so treatment decisions can be made more accurately. Eric R. Carlson, D.M.D., M.D., Department of Oral and Maxillofacial Surgery, is leading a diagnostic study to determine the value of positron emission tomography/computed tomography (PET/CT) scans.

The study involves imaging lymph nodes of the neck in patients with oral/head and neck cancer using two tracers, FLT and FDG. If PET/CT can accurately predict the presence or absence of metastatic cancer within the nodes, surgeons can provide more precise surgery. For more information, contact the Department of Oral and Maxillofacial Surgery at 865-305-9022.

Craig Towers, M.D., Maternal Fetal Medicine, is leading a clinical trial to study the accuracy of the lamellar body count in amniotic fluid contaminated by meconium, a newborn's first stool. The lamellar body count is a well-established test for fetal lung maturity, but little research has been conducted on its accuracy when



amniotic fluid contains meconium. Participants are women with high-risk pregnancies who are undergoing amniocenteses and consent to involvement. This study is enrolling. For information, contact the Department of Obstetrics/Gynecology at 865-305-9306.

A new trial will seek to improve bronchodilator therapy in patients recovering from severe exacerbations of chronic obstructive pulmonary disease (COPD). This trial is conducted by Rajiv Dhand, M.D., Department of Medicine. Participants will compare nebulizers and dry-powder inhalers to determine if one is superior in improving lung function and drug deposition. For information, contact Lauren Davis at 865-305-7975. ▲

WHY THIS MATTERS:

CLINICAL TRIALS AND DIAGNOSTIC INVESTIGATIONS BRING TREATMENTS TO PATIENTS MORE QUICKLY.

STUDENTS AMONG US: GETTING A HEAD START ON MEDICAL RESEARCH



UT student Brianna Rader, recent graduate of the Medical Explorations program, has conducted research in two programs at the UT Graduate School of Medicine, aided by her mentor, John Narro, M.D.

Through two unique programs at the UT Graduate School of Medicine, students—our future doctors and researchers—get an early exposure to medical careers and research. Each year, about 50 high school students participate in the Medical Explorations program, and each summer, a handful of medical students shadow researchers at the Graduate School of Medicine to learn the value of medical research.

“Completing the Medical Explorations program and working with researchers solidified my belief that successful doctors walk the line between the human side and the scientific side of medicine,” says Brianna Rader, now a 20-year-old student at the University of Tennessee, Knoxville, and 2009 graduate of Medical Explorations.

Rader assisted Tom Terrell, M.D., an associate professor, Department of Family Medicine Sports Medicine Program; John Narro, M.D., an associate professor in the Department of

Medicine and chief of the Division of Infectious Disease; and Jonathan Wall, Ph.D., a professor and director of Preclinical and Diagnostic Molecular Imaging Laboratory.

Medical students also can immerse in research. I. Reid Collmann, M.D., former dean of the Graduate School of Medicine, dreamed of empowering medical students with a passion for research and an understanding of how

research affects patient care. Through his family’s generosity, the Collmann Medical Student Education Endowment gives future doctors time in research labs, working alongside experienced researchers at the Graduate School of Medicine. Medical students and pre-medicine students can participate in a variety of specialties during the eight-week summer program.

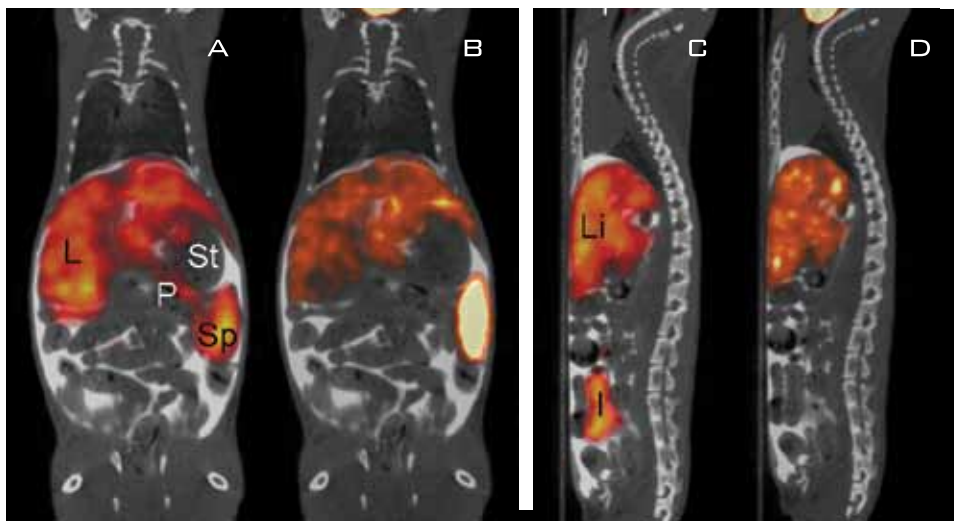
“By giving young people early opportunities, we are helping ensure good doctors in the future become good doctors who also conduct research on behalf of their patients,” says Mitch Goldman, M.D., the assistant dean for Research.

For more information about Medical Explorations, visit <http://gsm.utmck.edu/medexp/main.cfm>. For more information about the Collmann Medical Student Education Endowment, visit <http://gsm.utmck.edu/students/assistantships.cfm>. ▲

WHY THIS MATTERS:

FACULTY PHYSICIANS AND RESEARCHERS AT THE GRADUATE SCHOOL OF MEDICINE WORK EVERY DAY TO SUPPORT THE EDUCATION OF FUTURE DOCTORS, WHO WILL SHAPE HEALTHCARE IN OUR COMMUNITY.

PEPTIDE GOING CLINICAL, TRANSCONTINENTAL



Beating the competition. Using PET/CT imaging, Jonathan Wall, Ph.D., and his colleagues compared their p5 peptide imaging agent with an agent used in Europe, and the p5 agent imaged more completely. Figures A and C demonstrate the performance of the p5 peptide, imaging more amyloid deposition than Figures B and D, which were imaged by the European agent.

Technology developed by Jonathan Wall, Ph.D., a professor and director of Preclinical and Diagnostic Molecular Imaging Laboratory, and team members, Stephen Kennel, Emily Martin, Tina Richey and Alan Stuckey, beats the competition and is poised to go clinical. Recently, Wall developed a new peptide imaging agent, a protein he calls p5. By using the peptide in combination with positron emission tomography/computed tomography (PET/CT) imaging, the team has created a non-invasive way to detect amyloid, a substance comprised of sticky protein fibers and sugar molecules that is found in people with Alzheimer's disease and Type 2 diabetes. To further clinical trials using the new peptide, Wall and his colleagues started Solex LLC, a University of Tennessee start-up company, which received the right to license the intellectual property from the UT Research Foundation in 2012.

The peptide is turning heads in Europe. Every day, doctors in the U.S. send their patients with amyloid disease to Great Britain, the Netherlands and Italy for an imaging test not approved for use stateside. The European test relies on a protein that is isolated from human blood, so the U.S. Food and Drug

Administration will not approve its use. Wall's peptide, however, is synthesized, so he and his team believe the p5 peptide imaged with PET/CT is the combination that will bring this life-changing test to America.

"Using the p5 peptide and PET/CT technology, we compared our novel imaging agent with the European agent and found that p5 imaged amyloid in mice with chronic inflammation more completely," Wall says. "This test also might be relevant for imaging amyloid in patients with Type 2 diabetes, rheumatoid arthritis and other diseases."

UT Graduate School of Medicine is collaborating with major U.S. medical facilities to begin a Phase I clinical trial, which will study the safety of imaging using the p5 peptide. Once funding has been realized, this trial could start within 18 months. For more information about this research, call 865-305-5447. ▲

WHY THIS MATTERS:

THE SUCCESS OF THE P5 PEPTIDE HAS THE POTENTIAL TO BRING A CRITICAL IMAGING TEST TO THE U.S.

TRANSLATING RESEARCH FROM LAB TO LIFE: MELANOMA AND ODAM



Daniel Kestler, Ph.D., and James Lewis, M.D., are taking research from clinical observation to the lab and back to help patients with melanoma.

WHAT DO A BASIC SCIENCE RESEARCHER AND A SURGICAL ONCOLOGIST HAVE IN COMMON?

Daniel Kestler, Ph.D., and James Lewis, M.D., are a perfect example of the best aspect of an academic medical center: Translating research from lab to life. Kestler, the researcher, and Lewis, the surgeon, collaborate on research that is shedding light on melanoma and a seemingly unrelated protein called ODAM.

Melanoma is the deadliest form of skin cancer. ODAM (odontogenic ameloblast associated) is a protein molecule originally found in dental tumors but more recently has also been found in melanoma.

In a retrospective study, Lewis and his team found that in 75% of cases, patients who had sentinel nodes that were positive for melanoma had ODAM in the main tumor. This significant

clinical observation made its way back to Kestler, who began investigating why ODAM might be found in the main tumor. Soon, this work will circle back to the clinical setting, where the ODAM finding might be able to translate to therapy for melanoma patients.

This translational research already has resulted in prognostic information. “I am confident that when the primary tumor is ODAM positive, the chances are high that melanoma has spread to the nodes,” Lewis says. “This helps us help patients make decisions.”

Lewis is leading a prospective trial that seeks to determine the predictability of ODAM as it relates to metastasis. He hopes his work will prove ODAM is upregulated (expressed) in melanomas that have spread. A molecular marker could lead to a therapeutic target.

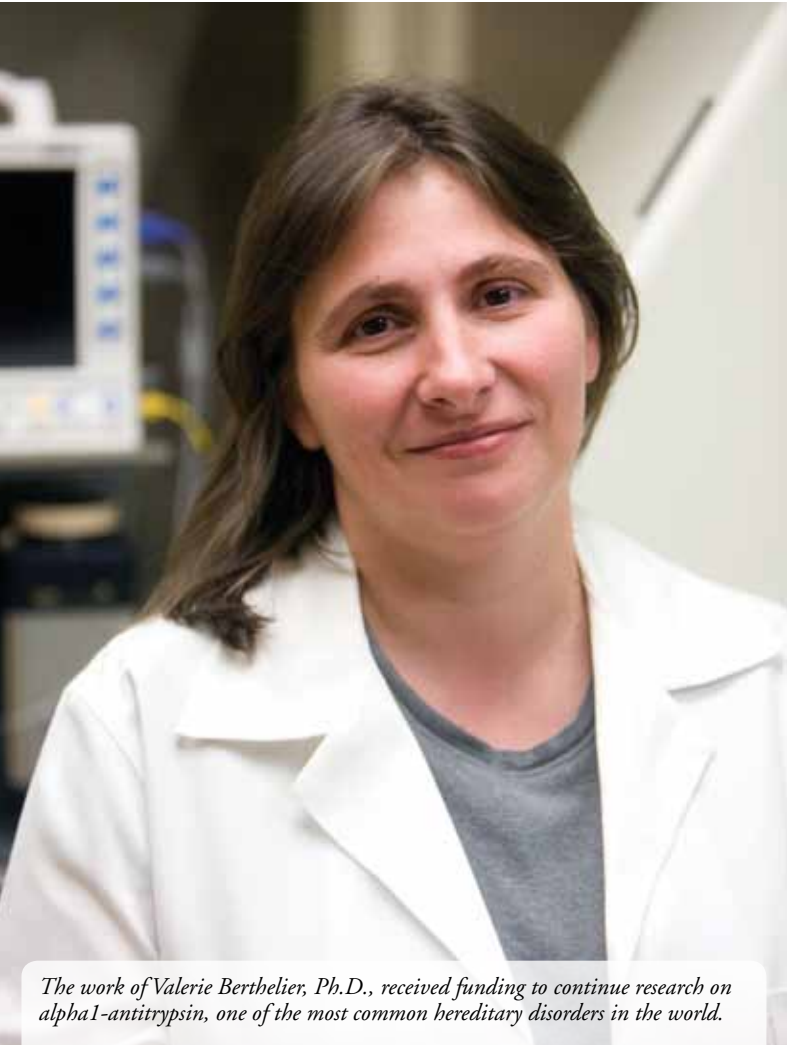
The answer is by no means easy. “Genes do different things in different pathways,” Kestler says. “We still have a lot of work to do at the cellular level.”

Kestler will attempt to determine ODAM’s role in tumor formation and regulation, and for patients with melanoma, he is working to answer if ODAM in the lymph nodes acts as a protective agent. ▲

WHY THIS MATTERS:

EVERY 60 MINUTES, SOMEONE IN THE U.S. DIES FROM MELANOMA. FINDING AN INDICATOR OF METASTASIS WILL IMPROVE ACCURACY OF DIAGNOSING AND STAGING THE CANCER AND EVENTUALLY COULD LEAD TO MORE TARGETED THERAPY.

RESEARCH IN LUNG, LIVER DISEASES FUNDED



The work of Valerie Berthelie, Ph.D., received funding to continue research on alpha1-antitrypsin, one of the most common hereditary disorders in the world.

Valerie Berthelie, Ph.D., an assistant professor and director of the Conformational Diseases and Therapeutics Research Laboratory, received a research study grant totaling \$200,000 from the Alpha 1 Foundation. Findings from the study, entitled, “Searching for Small Molecules as Potent Inhibitors of Z-AAT,” could affect more than 1 million adults and children.

The goal of Berthelie and her research team is to find efficient treatments for the disease alpha1-antitrypsin deficiency (AAT), a hereditary

condition that may result in serious lung disease in adults and liver disease in infants, children and adults. They hope to identify and design small molecules that can block the protein responsible for AAT from forming clumps therefore preventing its malfunction. As a result of this research, they will acquire additional knowledge on clump formation.

“Thanks to the Alpha-1 Foundation, we have the opportunity to be the first team to combine biochemical, computational and neutron science techniques,” says Berthelie. “This leads us closer to finding a cure.” The work will be conducted in collaboration with the University of Tennessee, Knoxville, and the Spallation Neutron Source/Oak Ridge National Laboratory over a two-year period.

Approximately 116 million people worldwide are carriers of AAT, and 1.1 million people have severe AAT, making it one of the most common and severe hereditary disorders in the world.

The Alpha-1 Foundation is a nonprofit Florida corporation dedicated to providing the leadership and resources that will result in increased research, improved health, worldwide detection and a cure for Alpha-1 disease. For more information, visit www.alpha-1foundation.org 



WHY THIS MATTERS:
FINDING A CURE FOR AAT COULD SAVE THE LIVES OF 1 MILLION PEOPLE.

NEWS»

DIAGNOSTIC TEST PIONEERED

A multidisciplinary team at the Graduate School of Medicine pioneered a novel diagnostic test for May-Thurner Syndrome (MTS), also known as iliac vein compression syndrome that is a compression of the iliac vein in the left leg. Described in the July 25, 2012, issue of *Annals of Vascular Surgery*, T. Matthew Jones, M.D., a fifth-year surgical resident, along with others modified a diagnostic technique using duplex ultrasonography by using a tourniquet-induced venous engorgement. Typically, ultrasonography does not thoroughly identify the obstruction, but the modified test reveals ilio caval obstruction characteristic of MTS.

PRESENTATION RECOGNIZED

David Pickett, M.D., a resident in the Department of Oral and Maxillofacial Surgery, received an award for his poster presentation at the recent annual meeting of the American Association of Oral and Maxillofacial Surgeons. Pickett's research investigated effects of rhBMP-2 (a synthetic protein to generate bone growth) treated with high doses of bisphosphonates, drugs often used to slow bone loss particularly for osteoporosis.

PHYSICIANS LEARN FROM OPIATE-ADDICTED BABIES



Craig Towers, M.D., an associate professor in the Department of Obstetrics/Gynecology, and colleagues have completed a short-term phase of research studying babies who are born with opiate addictions. For more than two years, the team examined the head circumferences and femur lengths of their small patients. They found that often babies born to mothers who abused strong narcotics, including roxycodone, oxycodone and Opana, while pregnant have smaller heads and longer femurs. Towers will present these findings at

an upcoming meeting of the Society for Maternal-Fetal Medicine. A long-term study now is under way to determine if the newborns' physical deformities at birth correlate with slow bone growth or cognitive and neurological delays as the children grow.

MEDICAL LIBRARIANS PRESENT FINDINGS

At the Medical Library Association meeting in October 2012, medical librarians from Preston Medical Library presented results of four research projects. One project compared the impact of a consumer and health information service on patient-healthcare provider interactions over a 10-year period and was presented by Sandy Oelschlegel, M.L.I.S., the director of Preston Medical Library, and others. Also presented by Oelschlegel was a survey of regional medical campus libraries in the southeast. Presented by Elizabeth Hinton, M.S.I.S., was a report describing building an informatics tool to facilitate analysis of a biomedical literature search, and J. Michael Lindsay, M.S.I.S., discussed the library's use and survey of mobile apps to connect with physicians and health consumers.

ECGs IN DEVELOPING COUNTRIES

Dale Wortham, M.D., a professor in the Department of Medicine, Division of Cardiology, and director of the Cardiac Catheterization Laboratories, and Xiaopeng Zhao, Ph.D., an assistant professor in the UT College of Engineering, Mechanical, Aerospace and Biomedical Engineering, recently collaborated with others on a means to improve the quality of care for patients in developing countries. They developed a computer algorithm to evaluate the quality of electrocardiograms (ECGs) collected using mobile phones. The computer algorithms examine noise and other interference to determine if the ECG signals are reliable in helping physicians make accurate diagnoses. This work has been lauded by the national Physionet/Computing in Cardiology Challenge and was published in *Physiological Measurement*. 

YOUR CHANCE TO ADVANCE

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Thank you.

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