SARVER HEART CENT ARIZONA A publication from the University of Arizona College of Medicine Newsletter Issue 61 • Fall 2011



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Endowed Professorship Will Advance Molecular Cardiovascular Research

arol Gregorio, PhD, director of the Molecular Cardiovascular Research Program and head of the Department of Cellular and Molecular Medicine at the UA College of Medicine, has been named the Luxford/Schoolcraft Endowed Professor of Cardiovascular Disease Research. Dr. Gregorio also is a co-director of the University of Arizona Sarver Heart Center.

As a basic scientist, she has a special research interest in the contractile proteins of heart muscle in health and disease. Not only has she made major contributions to the understanding of heart muscle abnormalities,



she also has been an integral part of the UA College of Medicine's and Sarver Heart Center's goal to strengthen its translational research. "It's important to understand that discoveries made in the laboratory are inspired by clinically relevant questions that challenge scientists to identify mechanisms so that we can improve how we address human disease," says Dr. Gregorio.

Dr. Gregorio's laboratory research is focused on identifying the components and molecular mechanisms regulating actin architecture in cardiac and skeletal muscle during normal development and disease. Actin



Newly named Endowed Professor Carol Gregorio (white coat) is congratulated by (from l. to r.) Dr. Gordon Ewy and Sarver Heart Center supporters Linda and Jim Lee in Prescott.

...from the Director

The UA Sarver Heart Center is excited to welcome new members and announce enhanced leadership to propel our vision of a future free of heart and vascular disease.

In this issue we announce the addition of two new Sarver Heart Center co-directors: Dr. Karl B. Kern and Dr. Robert S. Poston. In



The Sarver Heart Center leadership team (from left to right) Karl B. Kern, MD, Carol Gregorio, PhD, Gordon A. Ewy, MD, Robert S. Poston, MD.

joining Dr. Carol Gregorio, the co-directors provide strengths in cardiology, cardiovascular surgery and basic cardiovascular research.

We appreciate the many years of leadership provided by Humberto Lopez as chair of our advisory board and are pleased to announce that Kalidas Madhavpeddi of Phoenix is now our advisory board chair.

The Sarver Heart Center is delighted to acknowledge endowments that support our research and educational programs. The first is the appointment of Dr. Gregorio as the Luxford/ Schoolcraft Endowed Professor of Cardiovascular Disease Research. Next we honor Dr. William Roeske as the next recipient of the Allan C. Hudson and Helen Lovaas Endowed Chair of Cardiovascular Imaging.

Our congratulations go to Dr. Frank I. Marcus for being honored nationally and internationally

for his pioneering research in cardiac arrhythmias. Dr. Marcus is the world's authority on Arrhythmogenic Right Ventricular Dysplasia/ Cardiomyopathy—a rare disease that if undiagnosed can lead to cardiac arrest.

And, speaking of cardiac arrest, it was gratifying to see that Reader's Digest listed chestcompression-only CPR as No. 1 on its list of the 15 greatest medical advances in 2010. And the Arizona Medical Association honored the UA Sarver Heart Center and the statewide SHARE program with its public health

award for our research and advocacy of this lifesaving technique. Perhaps even more special was an additional award from emergency responders in Flagstaff who are recording more and more "saves" using the resuscitation protocols developed here at the UA Sarver Heart Center. Dr. Ben Bobrow and I accepted this award on behalf of all the members of the Resuscitation Research Group.

Thanks to the generosity of UA Sarver Heart Center supporters, we were able to award \$203,000 in funding for research grants to our members. Such support is critical to our effort as these start-up funds enable our scientists to obtain preliminary research results that are necessary to compete for national funding. Such research is needed to bring us closer to a future free of heart disease and stroke.

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Endowed Professorship continued from page 1

is an indispensable protein and a major component of heart muscle. Changes in actin, caused by genetic mutations that have been identified in humans, are a frequent cause of cardiomyopathies. Her research team is determining how genetic defects in this protein affect muscle force generation and muscle contraction, a state that leads to heart failure and may lead to sudden cardiac death.

"We are very excited about the progress that our basic scientists have made under Carol's leadership. She has helped direct the UA Sarver Heart Center's support of promising pilot studies that have led to national funding for their research studies–important in achieving our vision of a future free of heart disease and stroke," says Gordon A. Ewy, MD, director of the Sarver Heart Center.

"I'm extremely grateful for the generosity and vision of the Luxford and Schoolcraft families. This endowed professorship will enable our laboratory to initiate novel projects related to heart development, heart failure and sudden cardiac death that otherwise would not be possible," says Dr. Gregorio.

Robert and Betty Luxford were long-standing supporters of science and promoting philanthropic investment of scholarships through the ARCS (Achievement Rewards for College Scientists) Foundation– Phoenix Chapter. After visiting the UA Sarver Heart Center, as part of an ARCS' tour, the Luxfords made the generous and thoughtful decision to include the Sarver Heart Center in their estate plan.

In early 2009, Mr. Carlton D. Schoolcraft sent a letter to Dr. Ewy stating that he and his wife, Virginia, had admired the work of the Center and Dr. Ewy for many years. While not patients of Dr. Ewy's, the Schoolcrafts were compelled to improve the lives of those suffering from cardiovascular disease through a very generous estate provision.

"We are honored by gifts such as these. People like Mr. and Mrs. Luxford, and Mr. and Mrs. Schoolcraft have entrusted us with their legacies. This is not something we take lightly or for granted. To be able to name a fund after these individuals will help to remind each of us that we can continue to make a major difference. Endowments to the UA Foundation for the Sarver Heart Center provide support in perpetuity," says Dr. Ewy. ♥



The precise assembly and structure of filaments in heart muscle sarcomeres (single contractile units) are pivotal for efficient heart beats. It is the sliding of the filaments that drives muscle contraction. Mutations in these essential components often result in cardiomyopathy, a focus of the Gregorio laboratory.



Former advisory board chair, Humberto Lopez of Tucson (left), hands off the chair to Kalidas Madhavpeddi of Phoenix.

New Advisory Board Chair Accepts the 'Baton'

Kalidas Madhavpeddi, a Phoenix-area businessman, is the new chair of UA Sarver Heart Center's Advisory Board. A former international financial adviser for Phelps Dodge Corporation who currently consults for various companies, Mr. Madhavpeddi brings significant insight into strategic planning. More than this, he brings a strong passion for the work being done at the UA Sarver Heart Center. "His personal journey with heart disease makes him an ideal person for the chair of the advisory board," adds Dr. Gordon A. Ewy.

Mr. Madhavpeddi first met Dr. Ewy when he traveled to Morenci, Ariz., for specialty clinics. "Phelps Dodge used to use another hospital for care. I have to say, the care and insight of the cardiologists at Sarver Heart Center far surpass those physicals," says Mr. Madhavpeddi. "Serving as chair of the advisory board is one small way that I can express my gratitude for what they have done for me."

Mr. Humberto Lopez served as the advisory board chair for more than 15 years prior to Mr. Madhavpeddi taking the helm. During Mr. Lopez's tenure, the UA Sarver Heart Center building project was completed, the UA received the naming gift from the family of Robert Sarver and significant support was raised for faculty and research. "We cannot thank Bert Lopez enough for his many years of service as chair. His dedication and leadership have helped to chart a course that will benefit countless individuals at risk of heart disease and stroke," says Dr. Ewy.

"I look forward to Kalidas' insight, energy and leadership to help the Sarver Heart Center Advisory Board continue our quest." •



Choose Nutrient-Dense Food and Drink for a Lighter, Healthier Weight

By Lorraine Mackstaller, MD

Associate professor, UA College of Medicine and the *Edwin J. Brach Foundation and Hazel* and Bertram Brodie Endowed Lecturer for Heart Disease in Women, UA Sarver Heart Center

aintaining a healthy weight Lis one way we can strive to control some risk factors for cardiovascular disease. The latest Dietary Guidelines for Americans have two over-arching concepts: to maintain calorie balance over time to achieve and sustain a healthy weight, and to focus on consuming foods rich in nutrients, when compared to their calorie content. A good example is strawberries. One cup of strawberries contains only 150 calories, but 3.5 grams of fiber, 68 milligrams of vitamin C and 26.9 micrograms of folate. Nutrient-dense foods are the opposite of empty-calorie foods, which are low in nutrition when compared to their calorie content. Here is a handy checklist.



 Eat more vegetables and fruit, especially dark-green, red and orange vegetables, beans and peas. Remember, green is good.

- Choose a variety of protein sources, including lean meats and poultry, seafood, egg whites, beans and peas, and unsalted nuts and seeds. If you follow a Mediterranean diet, you are on a good course.
- Consume at least half of all grains as whole grains, replacing refined products. Keep telling yourself, "If it is white don't bite!"
- Consume less than 10 percent of calories from saturated fatty acids by replacing them with monounsaturated and polyunsaturated fatty acids.
- Keep *trans* fatty acids as low as possible by limiting solid



Balancing Calories

- Enjoy your food, but eat less.
- Avoid oversized portions.

Foods to Increase

- Make half your plate fruits and vegetables.
- Make at least half your grains whole grains.
- Switch to fat-free or low-fat (1 percent) milk.

Foods to Reduce

- Compare sodium in foods like soup, bread and frozen meals – and choose the foods with lower numbers.
- Drink water instead of sugary drinks.



fats and foods that contain synthetic sources of *trans* fats, such as partially hydrogenated vegetable oils.

- Use fat-free or low-fat (1 percent) milk, cheese and yogurt.
- Reduce calorie intake from solid fats and added sugars.
- Compare sodium content for foods such as canned soup and frozen meals, then select those with the least salt, limiting daily sodium intake to 2300 milligrams or less for healthy people.
- People with hypertension, diabetes or chronic kidney disease should cut their salt intake to 1,500 milligrams (a little more than half a teaspoon a day). High salt intake is linked to high blood pressure and heart disease and stroke.

- Limit cholesterol intake.
 Watch your portions of egg yolks and fatty meats, poultry and beef. Trim fat from meat and skin from poultry.
- Choose foods that provide more potassium, dietary fiber, calcium and vitamin D. These foods include vegetables and fruits, beans, whole grains and some dairy products.
- Eat nutritious food, instead of relying on supplements for beneficial nutrients.
- If you drink alcohol, consume it in moderation (one drink or less for women per day and two drinks or less for men).
- Drink water instead of sugary sodas or other sweetened drinks.

- Adults should engage in 150 minutes of physical activity a week. Walking is a great start, with a goal of walking two miles throughout the day. Children and adolescents age six and older should engage in at least 60 minutes of daily physical activity.
- Use smaller plates (these were common a generation ago) and think about your plate of food; divide it in quarters:
 - ¹/₂ should be filled with brightly colored foods such as vegetables
 - $\frac{1}{4}$ filled with a protein
 - ¹/₄ with a complex carbohydrate

Dr. Marcus Recognized for 'Enormous' Contributions to Electrophysiology and Arrhythmia Treatments

Frank I. Marcus, MD, professor emeritus of the UA College of Medicine and Sarver Heart Center member, was recognized by two professional societies for his significant scientific contributions to the treatment of cardiac arrhythmias this year.

The Heart Rhythm Society honored Dr. Marcus with its **Pioneer in Cardiac Pacing and Electrophysiology Award,** and the European Cardiac Arrhythmia Society honored him with its **Outstanding Achievement Award.**

Colleagues noted Dr. Marcus's enormous scientific contributions to the field of cardiology and electrophysiology, including more than 300 published manuscripts. He first learned of Arrhythmogenic Right Ventricular Dysplasia/ Cardiomyopathy from French colleagues while on a sabbatical in Paris. In 1982, he and his associates published the first comprehensive clinical description of this disease.

A leading authority on this rare but important inherited cardiomyopathy, he was the principal investigator of a study funded by the National Institutes of Health (NIH) that led to the publication of more than 55 manuscripts on ARVD/C. In 1984, Dr. Marcus pioneered the development of radiofrequency catheter ablation. In 1986, he and his colleagues published the first paper that systematically explored the use of radiofrequency energy for catheter ablation of arrhythmias. Since then, Dr. Marcus has published more than 50 manuscripts on various aspects of catheter ablation, including an initial description of the use of ultrasound energy for ablation in 1995.

As a professor emeritus, Dr. Marcus continues to be involved in teaching and research.

Daily Use Worldwide

"Radiofrequency energy catheter ablation, pioneered by Dr. Marcus, is used all around the world to treat cardiac arrhythmias. Indeed, with this therapy many intermittent arrhythmias can be cured, freeing the patient from long-term therapy with medication and repeated trips to the hospital," says Peter Ott, MD, associate professor of clinical medicine, and director of the Cardiac Electrophysiology Lab at The University of Arizona Medical Center.

Frank Marcus, MD, (center) with Peter Ott, MD, and Julia Indik, MD, cardiac electrophysiologists (heart rhythm experts) at UA Sarver Heart Center; who use radiofrequency catheter ablation on a daily basis to treat a wide variety of patients with arrhythmias.

This technology also is used in selected patients to treat atrial fibrillation, the most common type of arrhythmia. Today, several new technologies are paired up with radiofrequency ablation to treat complex arrhythmias. A threedimensional mapping system allows the re-creation of cardiac chamber geometry and movement of catheters inside this area in real time, facilitating precise catheter positioning and reducing X-ray exposure to the patient. Also, robotic catheter manipulation technology allows remote steering of the catheter inside the patient's heart, facilitating minute and

precise catheter movement and assessment of the catheter force against the cardiac chamber wall. "There was an overwhelming consensus that Dr. Marcus merits this award based on his many contributions over a remarkably sustained period of time. His personal integrity, kindness, enthusiasm for research and willingness to mentor young investigators–all were mentioned as attributes that should serve as an example to others," wrote Hugh Calkins, MD, who submitted the Heart Rhythm Society nomination.

Note: For more information on atrial fibrillation, please see Issue 59 of the UA Sarver Heart Center Newsletter at heart.arizona.edu/ news-info/newsletter.htm.





William Roeske Named to Endowed Chair

William R. Roeske, MD, has been appointed to fill the Allan C. Hudson & Helen Lovaas Endowed Chair of Cardiovascular Imaging at the UA Sarver Heart Center.

Dr. Roeske, who joined the UA College of Medicine faculty in 1985, is professor of medicine and pharmacology in the Section of Cardiology.

"For the past 20 years, Bill has been an important member of the Section of Cardiology and the Sarver Heart Center, serving as codirector of the fellowship program and as associate chief of the section for most of that time," says Gordon A. Ewy, MD, director of the UA Sarver Heart Center.

Dr. Roeske's current research interest is involved with the discovery of new modalities for the treatment of pain. "Current drug therapy for chronic pain is ineffective and often leads to addiction since the most effective drugs for short-term pain are opioids. We are looking at cellular mechanisms to try to understand how to block these responses," says Dr. Roeske. His laboratory has been NIH funded for 30 years. His prior research also has shown alterations in cardiac receptor types in hypertension and in heart failure.

"My life-long interest in cardiovascular imaging techniques supports and helps enhance the work of Dr. Aiden Abidov, our director of cardiovascular imaging," adds Dr. Roeske.

A native of Indiana, Dr. Roeske received his medical degree from Stanford Medical School, his post-graduate medical training at Case Western Reserve and his fellowship training at the University of California at San Diego. ♥

New Cardiology Members

toward a future free of heart disease and stroke

1986-2011



Sasanka Jayasuriya, MD, is an assistant professor who recently completed her advanced fellowship training in cardiology at the UA College of Medicine, Section of Cardiology. She was a recipient of the J. Allen Ginn Jr., MD, Endowed Fellowship at the UA Sarver Heart Center, an honor that recognizes her commitment to treat all patients with the best of care and utmost respect. Dr. Jayasuriya's primary clinical interest is in heart disease in women. Her research interest is in percutaneous coronary intervention.

Dr. Jayasuriya, a native of Sri Lanka, completed medical school at the University of Ruhuna, Sri Lanka, and her residency in internal medicine at the University of Arizona, following internal medicine training in New Zealand.



Divya Kapoor, MD,

is an assistant professor and a non-invasive cardiologist who recently joined Southern Arizona VA Health Care System. She completed both her undergraduate and medical degrees at the University of Washington, Seattle, and then her internal medicine residency at the University of Utah. After her residency she completed a fellowship in medical informatics at the VA in Salt Lake City.

Dr. Kapoor then went on to join University of Missouri Kansas City/Mid America Heart Institute for her general cardiology fellowship.

Her research interests are clinical outcomes in imaging and medical informatics. Her personal interest is women's heart disease. She is married and enjoys hiking and camping with her husband during her free time. •



Kapil Lotun, MD,

joined the University of Arizona and the Sarver Heart Center in August 2011 as associate professor of clinical medicine, cardiology. He is the director of the Structural Heart Disease Program, director of Vascular Medicine in Cardiology and associate director of the Cardiac Catheterization Laboratories.

Dr. Lotun received his vascular medicine, cardiology training and interventional cardiology fellowship training at the Tufts University School of Medicine in Boston.

His clinical expertise includes structural heart disease such as aortic valvuloplasty (repairing narrowed, aortic valves using balloon catheters). He also treats congenital heart defects, such as a ventricular septal defect (a "hole in the heart"), patent foramen ovale (tissue flaps in the heart that don't close properly) and atrial septal defect closure (failure of the wall between the two upper chambers remains open after birth, allowing abnormal blood flow through the heart). His specialty is in percutaneous procedures in which he uses special catheters to treat aortic and mitral valve disease and vascular diseases. These catheters also are used in endovascular interventions for vascular diseases and high-risk coronary procedures.

Dr. Lotun is a fellow of the American College of Cardiology, the Society of Vascular Medicine and the Society for Cardiovascular Angiography and Interventions. He is board certified in internal medicine, endovascular medicine, vascular medicine, echocardiography, nuclear cardiology, cardiology and interventional cardiology.

Dr. Lotun's research involves gene therapy in cardiac and vascular diseases. He has been co-investigator on several related NIH trials and investigations and has given presentations at the American Heart Association Scientific Sessions, Society of Cardiac Angiography and Interventions, and the Society of Vascular Medicine. He has published in various professional journals and has contributed book chapters on cardiovascular gene therapy. He is a reviewer for multiple journals, including Catheterization and Cardiovascular Interventions. JACC Intervention and Annals of Vascular Surgery. •

Heart Health Updates from UA S

SHC Seed Grants Sprout New Research and Patient Care Programs



Jim Gieszl with Scott Klewer, MD. The Gieszl family supports research on congenital heart disease.

From improved screenings for newborns to new research funding from the National Institutes of Health, UA Sarver Heart Center seed grants are helping to advance patient care and knowledge of heart disease.

In 2005-2006, a pediatric resident, Mike Seckeler, MD, was awarded \$5,000 from the *William J. "Billy" Gieszl Endowed Fund for Heart Research*, established by the

Gieszl family of Phoenix in memory of their young son and brother who died from complications due to a congenital heart disease.

Dr. Seckeler conducted a pilot study to see if pulse oximetry screening could identify newborns with cyanotic congenital heart disease (CCHD). This measurement of oxygen in the blood is done by a simple device that is placed on the infant's toes.

CCHD occurs when venous blood mixes with oxygenrich blood, resulting in unoxygenated blood in the arterial system. These defects may result in heart failure and even death in untreated infants. Newborns with advanced CCHD can present with bluish skin coloration, which makes diagnosis likely. For babies with smaller defects, pulse oximetry can help doctors diagnose CCHD before the infant gets into serious problems.

After the pilot project, Vicki Began, RN, vice president and chief nursing officer, and other members of The University of Arizona Medical Center leadership were convinced that "pulse ox" screening should be included in the quality of care of newborns. "The nursery staff felt the added cost of screening all newborns easily was justified by the increased peace of mind and satisfaction for parents," says **Scott Klewer, MD**, professor of pediatrics (cardiology), who mentored Dr. Seckeler.

"Thanks to advances in obstetric ultrasound, most infants with cyanotic heart conditions are identified prior to birth. However, since the pilot program began at the hospital in 2005, we have identified about one child with a heart problem in the normal newborn nursery each year through this program," says Dr. Klewer. In August 2011, the *Journal of Pediatrics* published a paper recommending that this screening be standard for all newborns.

On the basic science side, John Konhilas, PhD, assistant professor of physiology at the UA College of Medicine, has been awarded \$1.9 million by the NIH for a five-year study of the impact of AMP-activated Kinase on sex differences in hypertrophic cardiomyopathy. This study will attempt to identify the mechanistic



John Konhilas, PhD

link between cardiac disease, gender differences and energetic regulators in the heart.

Males and females respond differently to cardiac disease. Males typically show signs of worsening cardiac function while females do not. The way males and females uniquely handle the energetic deficiencies associated with cardiac disease underlies these differences.

Dr. Konhilas was a two-time recipient of a Steven M. Gootter Investigator Award through the UA Sarver Heart Center, a grant that enabled him to obtain data necessary to compete for this NIH funding. The Gootter award is named in memory of Steven, a beloved son, husband, father and friend whose life was cut short tragically by sudden cardiac arrest at age 42.

Heart Failure Research to Study Susceptibility to Pulmonary Congestion

Complications from heart failure, including pulmonary congestion, are among the top reasons for hospital admissions in the United States for individuals over age 65. Pulmonary congestion or edema is an abnormal build up of fluid in the air sacs of the lungs, which leads to shortness of breath. Not all patients with heart failure develop pulmonary edema, even if they have similar clinical characteristics and age, which suggests that a person's genes may contribute to the likelihood of developing pulmonary edema.

UA Sarver Heart Center members Paul Nolan, PharmD,

UA College of Pharmacy, and **Mark Friedman, MD**, director of the Heart Failure Program and the *Thomas and Sabina Sullivan, Sr., Endowed Chair for the Prevention and Treatment of Heart Failure,* are collaborating with Eric Snyder, PhD, assistant professor at the UA College of Pharmacy, the lead investigator on a five-year grant awarded by the NIH.

The goal of the study is to determine which heart failure patients will be more susceptible to the development of pulmonary edema. ♥

Niacin: To Take It Or Not to Take It?

If your doctor prescribes Niacin to help regulate your cholesterol levels, you may have questions regarding the AIM-HIGH study where the combination of extended release Niacin (Niaspan) and a statin was shown to be no more effective than statin alone in preventing cardiovascular events.

"It is important to know that this is one study of short duration and does not apply to all patients on Niacin treatment. There is good evidence based on several longer studies where Niacin was not compared to a statin that shows Niacin works. In fact, Niacin is the only cholesterol medication to date that was shown to be effective 15 years after the start of a study," says **Hussein Yassine, MD**, assistant professor of clinical medicine, who conducts cholesterol research. "We need to see the results of further studies before making any firm decisions regarding Niacin use," he adds. **v**



Hussein Yassine, MD



Young Mom Trades Artificial Heart for a New Heart

In January, Marcela Padilla, 21, walked out of University of Arizona Medical Center – The University Campus with a backpack slung over her shoulder. Inside was the 13.5-pound Freedom portable driver that powered the artificial heart implanted in her chest. She was the first woman in the nation to use the Freedom driver, which is undergoing a U.S. Food and Drug Administrationapproved clinical study in the United States.

This summer, Padilla walked out of the hospital again, this time with a donor heart and another chance at life. Suffering from severe post-partum cardiomyopathy shortly after giving birth to her son, the artificial heart was her only option until a donor heart became available. Fortunately, the Freedom driver gave her more options than being tethered to "Big Blue," a 418-pound machine that powers the artificial heart, but requires continuous hospitalization until transplant.

"The Freedom portable driver is a win on multiple levels," said **M. Cristina Smith, MD**, director of Heart Transplant and Ventricular-Assist Device Services and assistant professor of surgery. "It gives the patient the opportunity to be home, surrounded by loved ones. The hospital and the health system also win. You don't have someone in the hospital for prolonged periods of time. The cost savings to the health care system are going to be pretty significant."



Sarver Heart Center

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- Jan. 19, 2012 Gordon A. Ewy, MD What's So Different About Heart Disease in Women?
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