

## NEWS FROM THE CENTER FOR CARDIOVASCULAR AND PULMONARY RESEARCH

### —♥— A MESSAGE FROM PAM —♥—

#### THC Research Focus Groups

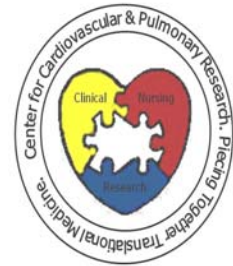
As we continue to build translational research within the Heart Center, I would like to encourage us to start exploring ways in which we can develop programmatic research. The vision is that these groups will center on our clinical strengths and will be based in congenital or acquired heart disease, preventive cardiology or fetal/childhood imprinting of adult disease. As you can see, these are pretty wide areas, and it will be up to each group to decide how to focus their program.

These groups should be multidisciplinary with physicians, nurses, nurse practitioners, fellows, biostatisticians, biomedical engineers, epidemiologists and basic scientists. The tone should be hypothesis development and experimental design; not who is going to be in charge or operational aspects of the project. In my experience, these types of think-tank groups are the most successful since they tend to focus on "big picture" problems and gaps in knowledge rather than on techniques and approaches. The research tends to be more innovative and comprehensive rather than the dreaded "incremental" that torpedoes many grant proposals!

Thanks to those who have already responded! Thus far, several potential themes have emerged. The most developed theme centers around adults with congenital heart disease. The second emerging area is improved outcomes following palliation of hypoplastic left heart syndrome. Other potential themes are right heart failure and biomarkers for disease progression or diagnosis in high-risk patients

We are not limited to these areas. Please forward any ideas you may have!

In the next few weeks we will start organizing these research focus groups. Remember, you are the experts and you know the challenges that face our patients, the caveats of current treatment and the diseases that need to be addressed!



*Icon designed by James Stewart, PhD*

#### Upcoming Events

##### **Day for Hearts Celebration**

Thursday July 16, 2009

4:00PM-7:00PM

Stecker Auditorium

##### **Start! Heart Walk**

to benefit the

American Heart Association

Saturday August 22, 2009

9:00AM-12:00PM

Huntington Park

**Volume I, Issue 3 - May 2009**

**Edited by Diane Carver & Irene Snyder**

**Photographer: Mark Rice**



## FEATURED RESEARCH—Aymen Naguib, MD

Patients undergoing cardiac surgery experience a substantial stress response mediated by the release of increased levels of stress hormones and cytokines. Cardiopulmonary bypass (CPB) accentuates this response due to activation of the immune system by direct contact of blood to foreign surfaces, ischemia-reperfusion injury to vital organs, and systemic endotoxemia due to translocation of endotoxin from the gut. This increased stress response has been observed in adults and babies irrespective of the type of surgery they have received. The stress response and associated inflammation have been shown to result in increased morbidity and mortality during the post-operative recovery period. However, due to their delicate metabolic balance, neonates and infants undergoing cardiac surgery are at even greater risk of experiencing complications and poor outcomes due to surgical stress and inflammation.

It has been suggested that the surgical stress response can be modulated or reduced through the use of different doses or combinations of anesthesia and analgesia drugs. Only a few studies, however, have explored this claim. In addition to reducing stress response, we believe that using low-dose narcotic technique in addition to dexmedetomidine will also promote early extubation, which can further reduce morbidity and mortality by eliminating ventilator associated complications. A review of our experience at Nationwide Children's Hospital using low dose fentanyl (7-10 mcg/kg) with inhalational agent alone or in combination with propofol or dexmedetomidine infusion illustrated that early extubation in the OR after congenital cardiac surgery is both safe and achievable. Of 874 cases we reviewed, 614 patients were extubated in the OR, and only 9 (1.5%) required reintubation. Our data also showed that the average length of ICU stay, an indication of post-operative morbidity, for the patients who were extubated early was 3.6 days, while the average length of ICU stay for the patients who remained intubated was 13.2 days.

In this study, we want to compare these techniques (low dose fentanyl alone or in combination with dexmedetomidine) to the high dose fentanyl technique being adopted at many centers across the country. In our retrospective study, we have successfully performed early extubation on VSD, AVSD, and TOF surgical patients after using either low dose fentanyl alone or low dose fentanyl plus dexmedetomidine over the past five years. Therefore, we plan to use this patient group in a prospective, randomized blinded study to compare the relative effectiveness of the different anesthetic techniques in reducing cardiac surgical stress. Patients will be randomly assigned to one of three groups in a block randomization trial design.

Our hypothesis is that dexmedetomidine, in addition to a low narcotic anesthesia and analgesia regimen, will reduce stress hormone levels while promoting early extubation after surgery, resulting in a measurable reduction in post-operative complications. This will lead to better outcomes for our patients. In addition, this study will produce much needed data in an area that

### UPCOMING FUNDING OPPORTUNITIES

#### **American Heart Association's National Clinical Research Program**

Encourages early career investigators who have appropriate and supportive mentoring relationships to engage in high quality introductory and pilot clinical studies that will guide future strategies for reducing cardiovascular disease and stroke while fostering new research in clinical and translational science, and encourages community- and population-based activities. This grant is not to fund basic science or to support senior researchers, but encourages mentoring of early career investigators.

**Application Deadline: July 22, 2009**

**Award Duration: Up to 2 years**

**Annual Award Amount: Up to \$55,000**

#### **American Heart Association's National Scientist Development Grant**

Supports highly promising beginning scientists in their progress toward independence by encouraging and adequately funding research projects that can bridge the gap between completion of research training and readiness for successful competition as an independent investigator.

**Application Deadline: July 22, 2009**

**Award Duration: 4 years**

**Annual Award Amount: \$77,000**

The **American Diabetes Association** is accepting applications for their Nationwide Research Awards, Development Awards, Training Awards, and Targeted Awards. Applicant eligibility, award amounts, and project timeframes vary based on each category, and submissions are **due July 15, 2009**. For more information visit [http://professional.diabetes.org/Diabetes\\_Research](http://professional.diabetes.org/Diabetes_Research)

**If you are interested in applying or would like more information on AHA or ADA programs, please contact Diane Carver who will coordinate the submission with your Sponsored Projects Officer.**

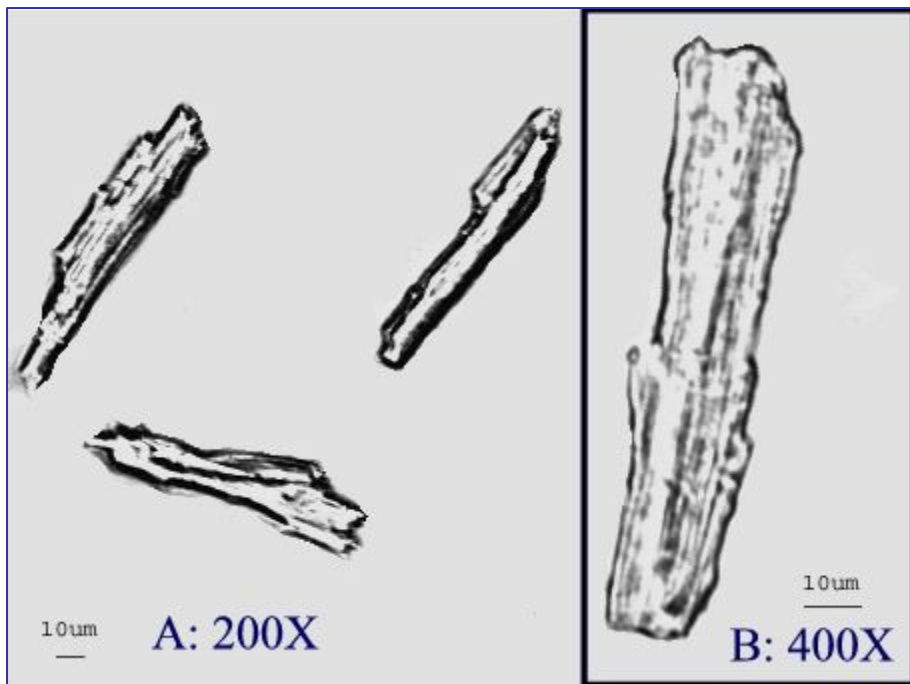


## FEATURED RESEARCH—Loren E. Wold, PhD

My research is based on how cardiovascular function is affected under different disease states, in particular diabetes. My laboratory uses isolated myocyte preparations to study the organ at the cellular level, with endpoints including real-time function, intracellular calcium concentration and intracellular reactive oxygen species (ROS) signaling. The use of myocytes allows us to assess the "functional unit" of the heart under disease states and determine how alterations in myocyte function can translate into changes in whole heart function. I have also become interested in how the heart responds to environmental stressors, including particles within the air.

While doing a postdoctoral fellowship in Los Angeles, we performed a study showing that particles from the air, termed ultrafine particulate matter, were able to traverse the endothelial lining of a blood vessel and travel through the bloodstream. This allowed the particles direct access to the heart, with resultant depressions in cardiac function. We also know from the clinic that on days of high air pollution, there is a significant increase in sudden cardiac death, which is exacerbated in patients with pre-existing heart conditions (such as seen in diabetics). Currently, we are interested in the signaling mechanisms involved in this functional change, as well as how particles directly effect isolated cardiomyocytes.

My work is funded by the American Heart Association, National Affiliate (Scientific Development Grant, "Ultrafine particle-induced heart dysfunction") and we have submitted a project to the National Institute of Health examining how exposure to particulates affects the development of insulin resistance in a mouse model of infant particle exposure.



Isolated cardiomyocytes from a rat. Note the striations and unique structure of the cells. These cells make up the "functional unit."

**You never change things by fighting the existing reality.**

**To change something, build a NEW model that makes the existing model obsolete.**

**Buckminster Fuller**

## Staff Highlights

**Maqsood Chotani, PhD**, was selected as a judge at the **14th Annual Richard J. and Martha D. Denman Undergraduate Research Forum** at The Ohio State University.

**Loren E. Wold, PhD**, was named a Star Reviewer for the **American Journal of Physiology - Heart and Circulatory Physiology** for 2008, and was invited to serve as the Review Editor for the journal **Life Sciences**, where he will coordinate all invited reviews to the journal, as well as all special content issues.

## Poster Presentations

### Pediatric Academic Societies

**Alicia Alcamo**: Increased Cytokine Production Induced by Cyclic Strain in Immature Intestinal Epithelial Cells and Altered Cell Density Induced by Cyclic Strain in Immature Intestinal Epithelial Cells

**Carl Backes, MD**: Particulate matter (PM 2.5) exposure decreases placental cell viability

**Bing Han, PhD**: Prenatal Lipopolysaccharide Exposure Exacerbates Murine Cardiac Function

**Danice Johnson, MD**: Extracellular Mitochondria as Mediators of Cell Death and Injury

**Wendy Luce, MD**: Interactions of Innate Immunity, Oxidative Stress and Calcium Handling Pathways in Endotoxin-induced Cardiac Failure

**Juli Richter, MD**: Lipopolysaccharide (LPS) and Necrotic Cell Debris Alter Wound Healing of Immature Intestinal Epithelium

# Meet Our Staff



**Alicia Alcamo** is leaving the Giannone Lab in July to resume her third year in medical school at The Ohio State University—we wish her the best!

*Tell us a little about yourself...*

I love sports. I'm a diehard Philadelphia Phillies fan and hope to one day see all the baseball stadiums! I can make balloon animals (although Brandon has now surpassed my skills and has become an expert balloon sculpturist after just one day!)

*What will become a favorite memory of working in the Giannone Lab?*

I honestly cannot pick just one! I've been very lucky to work with some great people in the Giannone Lab; they have made my experience so wonderful and definitely something I will never forget.

*Do you have a "signature" recipe?*

My "signature" has to be my buckeye cookies – basically a buckeye with a brownie base. Definitely a great one for football parties!

*What are you planning to do with your medical degree?*

I'm not quite sure exactly what I want to do yet with my degree. There is a very good chance I'll enter into Pediatrics, but I want to keep my options open as I enter into my third year and explore many different fields. One thing I do know for sure is that I want to continue down a path that allows for me to be heavily involved with research and academic medicine.

*What's your favorite music to jam to in the lab?*

All depends on the day – I love a lot of different types of music, but anyone around in the early mornings or weekends, typically found me singing along with my iPod to the sound track from Scrubs or songs by Dispatch, Red Hot Chili Peppers, Cake, Jimmy Eat World, and Foo Fighters... to name a few.



mouse myocardium stained to show the microvasculature

Compliments of the Bauer Lab

**President Obama  
Addresses NAS  
Annual Meeting**

In a speech to National Academy of Sciences (NAS) members gathered for the Academy's 146th annual meeting April 27, 2009 in Washington, DC, President Barack Obama announced major initiatives to boost research funding and bolster math and science education. He said he was restoring science to its rightful place, and urged NAS members to join him in creative efforts to engage young people in science.



Full speech transcript:

[www.nationalacademies.org/morenews/20090428.html](http://www.nationalacademies.org/morenews/20090428.html)

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**Works  
In Progress**

*New Day—Time— Location*

**Mondays 12:00-1:30**

**Room WA2525**

**Upcoming Presentations**

June 22nd—Hot Topics

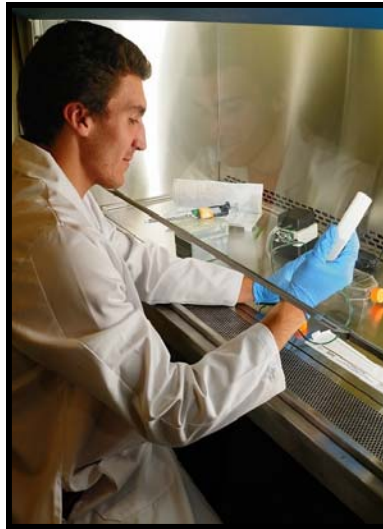
June 29th—Diane Carver

July 6th—Teambuilding

July 13th—Hot Topics

July 20th—Bing Han, PhD

July 27th—Jessica Evans



# Meet Our Staff

**Paul El-Dahdah** is leaving the Chotani Lab in July to attend medical school at Ohio University in Athens— best of luck, Paul!

*Tell us a little about yourself...*

Hello everyone! My name is Paul El-Dahdah and I'm a recent college graduate from The Ohio State University. Although I was born in Connecticut and spent a few years living there, both my parents are Lebanese and I had the opportunity to live in Lebanon and Saudi Arabia during different stages of my life. I am very active and enjoy working out, playing sports recreationally, and spending as much time as I can outdoors. I love to travel and to learn about different cultures and their customs.

*What are you researching in the Chotani Lab, and what is your favorite aspect of your lab work?*

In very basic terms, Dr. Chotani investigates how a certain stress receptor travels from within a smooth muscle cell to its membrane under certain conditions. Dr. Chotani has been an amazing mentor, as he has taught me so much—from starting up a lab and carrying out many routine lab experiments, to teaching me the significances of working in teams and collaborating with others for the benefit of a group. It is working with people like Dr. Chotani and his Post-doc, Selvi Jeyaraj, which I love most about my lab work.

*What are you looking forward to most in medical school?*

Wow! I will need to request for an entire *Research Beat* newsletter edition dedicated to me in order to answer this question. Truly, I am looking forward to everything OU has to offer to me, from the big move to Athens after living in Dublin, Ohio for the past nine years, to learning about Osteopathic Medicine and all that it entails. I would say the biggest thing I look forward to are the challenges that come with attending medical school.

*What CD is in your car player today?*

Hah! To be honest, I am currently listening to rapper 50 Cent's third album, *Curtis*. I enjoy listening to rap and hip hop very much, however, there is a good chance you may catch me listening to techno too, specifically electro, house, and dance mixes. Then again, my ears are open to anything, and I don't mind jamming to 80's rock, 90's grunge, pop and even Arabic and Latin tunes.

*Tell us about your recent vacation to Bulgaria...*

I visited a very good high school friend of mine who moved back to Bulgaria about a year ago. It was an amazing two week vacation that consisted of several hiking trips (one of which was to the third highest peak of the country, "Maliovitza"), touring and biking through Sofia, the capital, and driving through many villages, enjoying the beautiful landscape and mountainous terrain. I also took the time to pass through London on my way back to the States, and spent half a day there site-seeing. I must add that I got to ride the "London Eye," the biggest Ferris wheel in Europe.



American Heart  
Association



*Learn and Live*

# HEART WALK<sup>®</sup>

Nationwide Children's Hospital is teaming together with The American Heart Association for Start! Heart Walk 2009. As The American Heart Association's signature fund-raising event, the Start! Heart Walk promotes physical activity and heart-healthy living in a fun, family environment. The 2009 event takes place **Saturday August 22nd** at **9:00AM** and will be held at the new home of the Columbus Clippers, **Huntington Park**.

This event helps AHA achieve their mission of building healthier lives free of cardiovascular disease and stroke. You and your family, friends, and neighbors can walk and raise funds that support research for heart disease and provide educational and community services right here in Columbus. This year more than 1 million walkers will participate in more than 450 events, raising funds to save lives from America's #1 and #3 killers; heart disease and stroke.

This year, NCH is dedicating \$10,000 for sponsorship of the Start! Heart Walk. Children's walker fund-raising and donation goal is \$35,000—with a total contribution of almost \$50,000 from our organization to support this AHA event.

In order to meet this goal, we need your help! You, your family, friends, co-workers, and neighbors can register to raise funds and walk, or join the cause and make a donation! And pets are welcome to walk too!

*For more information contact Paula Thompson or Diane Carver.*



*Walkers at the 2008 Start! Heart Walk, Downtown Columbus*



*AHA information provided by:*

Maria Kuzel

Start! Heart Walk Director

[maria.kuzel@heart.org](mailto:maria.kuzel@heart.org)