

VUMC Fall 2013 Update

Pulmonary Arterial Hypertension Research: Progress on our research currently funded by National Institutes of Health Grants

Sex Hormones in Pulmonary Arterial Hypertension (PAH):

Many thanks to all of you for participating in our research, without your help no progress could be made.

The goal of this project is to understand why females develop PAH more often than males and determine how different estrogens change PAH risk. This study uses a reproductive questionnaire combined with blood and urine measures to study participants with and without PAH. We previously showed that the type and level of estrogens in a person's body may alter their risk of developing PAH. Although males have less estrogen hormones than females, we also recently demonstrated that estrogen differences are an important determinant of PAH risk for males. In the past year we have made tremendous progress in terms of participant enrollment, with over 600 subjects enrolled. We are very grateful for your support of this project. If you have donated blood or urine, it is being used for this project and we are actively working hard to solve the mystery of why females are affected by PAH more often than males.

Our collaborator, Dr. Wendy Chung and her research group at Columbia-Presbyterian Medical Center in New York, are also busy requesting samples from their participants.

Spotlight: *We pay a sad good-bye to Kelly Fox Burke, who has been the research nurse coordinator for this effort in concert with DeWayne Ames. We are excited to welcome Shannon Cordell, who will be taking on Kelly's role for the project.*



Fall 2013



- Sex Hormones in Pulmonary Arterial Hypertension (PAH)
- Insulin Resistance in PAH
- Insulin Resistance and the Heart
- Other problems of metabolism
- *Spotlight:*
New Faces of 2013
DeWayne Ames
Shannon Cordell
Angie Lechman

Spring 2014



- Safety and Mechanism of ACE2 to Treat PAH
- Endothelial Dysfunction in PAH
- Genetic Variations in Pulmonary Arterial Hypertension (PAH)
- *Spotlight:*
Dr. James West
Dr. Eric Austin &
Dr. Rizwan Hamid



Insulin Resistance in PAH:

This project will study the role of insulin resistance in pulmonary arterial hypertension and determine if therapies to treat insulin resistance will improve PAH. Insulin resistance is a condition in which the body produces insulin but does not use it effectively. When people have insulin resistance, glucose

Insulin Resistance and the Heart

Because insulin resistance can affect the heart as well as the blood vessels in the lungs, we are working with Dr. Evan Brittain in cardiology to see how metabolism and insulin resistance might affect the heart's

understanding what controls this alteration in energy metabolism and trying to change it back toward normal.

**** For general questions, enrollment, concerns, or comments about this research; please contact Lisa Wheeler, Study Coordinator: 800-288-0378 or lisa.wheeler@vanderbilt.edu.**

THANK YOU!!!

***Spotlight:** Please welcome Angie Lechman to the team. She will be our nurse coordinator for this project. Angie is a skilled nurse who is aiding in these studies.*



(sugar) builds up in the blood instead of being absorbed by the cells, leading to type 2 diabetes or prediabetes. In the past year we have made progress in animal studies looking how insulin resistance might affect pulmonary hypertension. We are now trying to figure out how insulin resistance happens in patients with PAH. We will be enrolling patients in these studies in the next year. After we understand the causes of insulin resistance in PAH, we plan a study of treatments for insulin resistance in PAH. We are very grateful for your support of this project. If you have donated fasting blood, it is being used for this project and we are actively studying it in the lab!

response to the stress of PAH. These studies use cardiac MRI (magnetic resonance imaging) to study heart function and signs of insulin resistance in the heart. We are hopeful these studies will lead to new treatments for heart failure in PAH.

Other problems of metabolism:

In addition to insulin resistance, Dr. Joshua Fessel is studying other problems of metabolism in patients. Our research suggests that pulmonary hypertension may involve a major change in the basic ways that cells convert food into energy (metabolism). This change might be part of the process that actually causes and sustains the disease. One focus of our current work is

Recent Publication Highlights



[A novel channelopathy in pulmonary arterial hypertension. N Engl J Med. 2013 Jul 25;369\(4\):351-61. doi: 10.1056/NEJMoa1211097. Ma L](#)

[Longitudinal analysis casts doubt on the presence of genetic anticipation in heritable pulmonary arterial hypertension. Am J Respir Crit Care Med. 2012 Nov 1;186\(9\):892-6. doi: 10.1164/rccm.201205-0886OC. Epub 2012 Aug 23. Larkin EK.](#)

[Physical activity limitation as measured by accelerometry in pulmonary arterial hypertension. Chest. 2012 Dec;142\(6\):1391-8. Pugh ME.](#)

[Testosterone negatively regulates right ventricular load stress responses in mice Pulm Circ. 2012 Jul;2\(3\):352-8. doi: 10.4103/2045-8932.101647. Hemnes AR.](#)

[A potential role for insulin resistance in experimental pulmonary hypertension. Eur Respir J. 2013 Apr;41\(4\):861-71. doi: 10.1183/09031936.00030312. Epub 2012 Aug 30. West J.](#)

