



Indiana University
School of Medicine

Indiana Center for Vascular Biology and Medicine Newsletter Vessels and Vitality

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Cryptic Masons Medical
Research Foundation

Happy Fall! This newsletter focuses on the importance of training, and in particular, on one of our Indiana Center for Vascular Biology and Medicine, (ICVBM) trainees, **Daria Barwinska**. Daria joined the elite ranks of trainees three years ago, and now is a senior graduate student in the laboratory of Keith March, MD, PhD, where she has been conducting research in two important areas:



1.) The role of bone marrow stem cells working together with adipose stem cells **to repair lungs from smoking-induced disease**.

2.) The effect of smoking on the function of adipose stem cells to **build and repair blood vessels**.

Daria has been a "point person" in collaborations between the March research group, as well as Drs. Hal Broxmeyer and Irina Petrache, two key internationally recognized colleagues in the ICVBM. Her research has led to the important discovery that **smoking impairs an individual's stem cell health**. In fact, this effect is so severe that the stem cells harvested from smokers are essentially non-functional in key tests designed to measure their ability to help support blood flow. Knowing this has prompted Daria to pursue an understanding of what happens to stem cells when a person is smoking, and also is a basis for other projects testing the effects of cardiovascular risk factors on stem cell function. **Understanding the problems of smokers' stem cells will suggest therapeutic approaches to help rescue and repair in smokers.**

This work has also helped lead to our emerging theory that **smoking causes an acceleration of aging** throughout the body. We believe that this occurs specifically due to loss of stem cell repair throughout the body.

As Daria's research progresses, we look forward to learning about the factors that underlie the smoke-induced failure of stem cell repair, and may in fact be related to aging in general. We are planning clinical studies to help address aging related diseases and frailty, building on her findings.

The training of future researchers in vascular biology and medicine is a very important goal for the present researchers of our center. These trainees represent a critical part of the “engine” for future discoveries and cures in this critical field. There are several levels at which our training occurs. Many of our faculty host undergraduate or even high school students for summer internships in their laboratories. Medical students and residents also often elect to take research rotations in our laboratories, to help them decide about their future careers, specifically whether they want to pursue academic medicine as a particular calling: **“working today to create the medicine of tomorrow.”** Graduate students like **Daria** are those who have made the commitment to research, and are pursuing their Master's degree or doctoral degree (PhD). These are important colleagues in our research environment as they work to learn the techniques, intellectual approaches, and teamwork skills that are all important to future research success. Post-doctoral scientists are those who have completed their graduate degree (either an MD or PhD), and are in pursuit of additional training, which builds on the training they have already received. This additional experience prepares them for either faculty positions or work as scientists in the biotechnology or related industries. In the ICVBM, we are thankful to have been **funded for the past decade by the National Institutes of Health as a training center for the vascular scientists of the future.** Our programmatic support from NIH supports 5 post-doctoral salaries each year. This support from the National Institutes of Health **builds directly** on the foundational support from **the Cryptic Masons’ Medical Research Foundation.** The generosity of this foundation has enabled many pilot studies to be pursued by both our trainees and faculty, and provided support for Daria to conduct her original research. This support enabled her to obtain funding from the American Heart Association, for a highly competitive pre-doctoral award.