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Introduction

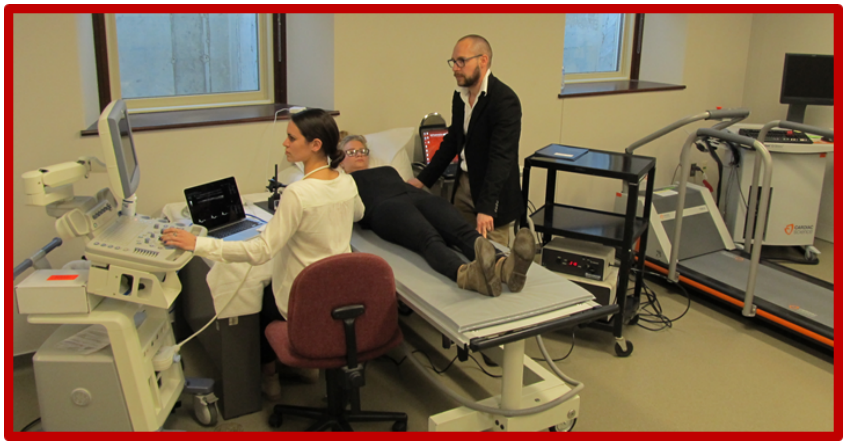
The University of Missouri is one of only 34 public universities in United States, and the only public institution in Missouri, to be selected for membership in the Association of American Universities. The mission of the Department of Nutrition and Exercise Physiology at the University of Missouri is to improve the health of Missourians and the larger population through research, teaching and outreach related to nutrition and physical activity.

Challenge

Dr. Padilla's research is primarily focused on understanding the physiological and molecular mechanisms by which physical inactivity and obesity-associated insulin resistance leads to impaired vascular function.

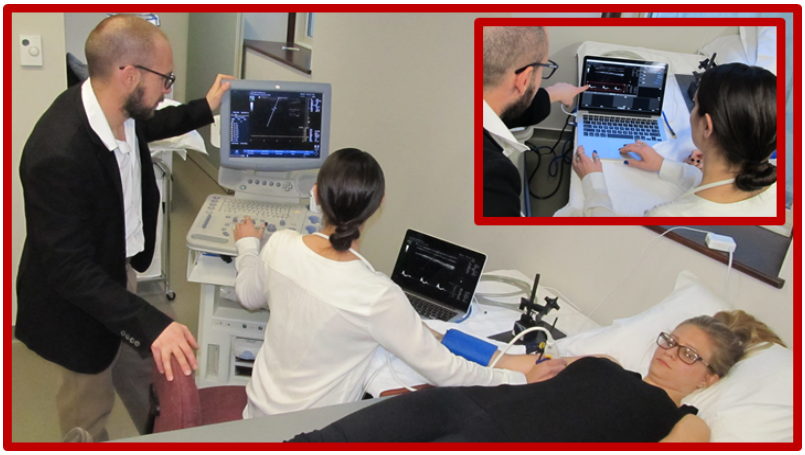
Research

His research is integrative and incorporates *in vitro* endothelial cell and whole-vessel culture models, *in vivo* metabolic and cardiovascular studies in small and large animals, and translational vascular studies using human subjects. To conduct this work, Dr. Padilla has a wet lab space and a human cardiovascular function laboratory, all of which are equipped with cutting edge instrumentation. The work of Dr. Padilla is currently supported by the National Institute of Health and other internal funding sources from the University of Missouri.



Flow-mediated dilation (FMD)

One of the techniques that are routine in Dr. Padilla's laboratory is flow-mediated dilation (FMD), which serves as an index of endothelial function. Optimal assessment of FMD requires simultaneous and continuous acquisition of blood velocity and arterial diameter via high resolution Doppler ultrasound together with the use of specialized automated arterial wall-tracking software.



Cardiovascular Suite

According to Dr. Padilla, Cardiovascular Suite (QUIPU) offers an excellent package for wall-tracking analysis in FMD studies. In his opinion, this program is very user friendly allowing students to become trained and proficient more rapidly than when using other programs that are commercially available. As illustrated in these images, graduate

student Lauren Walsh, under the guidance of her mentor Dr. Padilla, is performing an FMD study using the Cardiovascular Suite software.

Quipu srl is a spin-off company of the Italian National Research Council and the University of Pisa, Italy. The mission of Quipu is to provide products and services in high-tech diagnostic and preventive medicine. In particular, the core business is the development and production of systems and techniques for assessing early markers of cardiovascular risk.

Quipu's main product is Cardiovascular Suite, which is a software program for assessing markers of cardiovascular risk from ultrasound images. The suite consists of two applications: (i) FMD Studio, for assessment of endothelial function; (ii) Carotid Studio, for assessment of carotid stiffness and intima media thickness. The advantages of the Suite are: high reliability and accuracy, high integration, ease of use, real-time processing. Furthermore Quipu offers consultation services, image reading services and training programs.

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