

# WVU Health News

News Releases



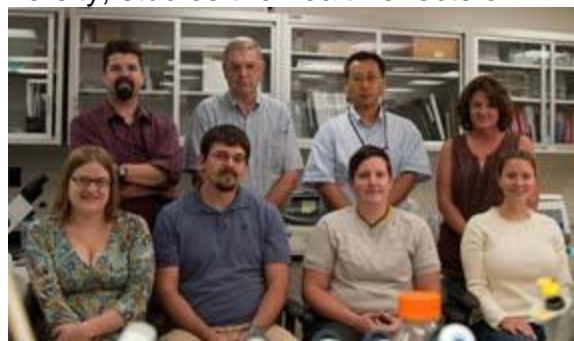
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## WVU studies health effects of nanoparticles

### *Recovery Act funds build lab, support scientists*

MORGANTOWN, W.Va. – Manufacturers around the world are using new technology to incorporate tiny manmade particles into hundreds of industrial and consumer items. But what happens when these miniscule materials get loose in the air, and are sucked into someone’s lungs?

Timothy Nurkiewicz, Ph.D., of West Virginia University, studies the health effects of inhaled nanoparticles. With the help of federal stimulus funds, Nurkiewicz has created a unique new combination of laboratories and equipment for these studies at the university’s Center for Cardiovascular and Respiratory Research.



Nanoparticles are some of the world’s smallest pieces of matter, visible only with a high-powered microscope. Although a recent innovation, nanoparticles are now commonly found in fuel additives, clothing, filters, surface coatings, computer components, and antibacterial items, with new uses developed almost daily.

At the WVU lab, Nurkiewicz’s research team is focused on how inhaled nanoparticles affect the tiniest blood vessels in the body that make up the microcirculatory system. These microscopic vessels are critical to every organ in the body: they deliver oxygen and removes waste continuously. If they are damaged, cardiovascular disease, metabolic syndrome, and other diseases are likely to follow.

Studying the effects of nanoparticle inhalation requires a facility where the particles can be aerosolized and delivered to research animals in tightly controlled and monitored exposure chambers. Only a handful of these facilities exist throughout the country, and only at WVU is it possible to link this research with the microvascular research that can track the impact of the inhaled substances on tiny blood vessels.

WVU's new inhalation facility is the result of a two-year, \$1 million National Institutes of Health Challenge Grant, provided as a part of the American Recovery & Reinvestment Act of 2009.

Among the research questions Nurkiewicz's team will address are toxicological characterization of inhaled nanoparticles, the time of onset of symptoms, the length of time for which effects can be measured, the impact of nanoparticles on subjects of different ages and gender, and the relationship between dose and effect. The lab facility allows researchers to measure the effects of varying doses of nanoparticles in the air.

The inhalation facility is headed by Jinghai Yi, Ph.D., an experienced aerosol engineer with an extensive background in mechanical engineering. In the microvascular lab, Travis Knuckles, Ph.D., leads toxicological assessments, and Phoebe Stapleton, Ph.D., recently joined the laboratory to lead assessments of microvascular function. Graduate students Katrina Porter and Valerie Minarchick and research technicians Carroll McBride and Kimberly Wix contribute to the research. The group also collaborates with researchers in the National Institute for Occupational Safety and Health labs in Morgantown.

Nurkiewicz's project is titled, "Microvascular Health and Nanoparticle Exposure."

For more information, see <http://www.hsc.wvu.edu/ccrs>.

*Photo caption (left to right): Front Row- Valerie Minarchick, Travis Knuckles, Ph.D., Katrina Sites, Pheobe Stapleton, Ph.D. Back Row-Timothy Nurkiewicz, Ph.D., Carroll McBride, Jinghai Yi, Ph.D., Kimberly Wix*

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