



written by Steve Sandstrom

Gagnon studies genetics of ALS

Could lowering the thermostat help us live longer? Andrzej Bartke, PhD, thinks so. His NIA-funded studies hope to prove that cooler temperatures cause metabolic characteristics associated with delayed aging – increased oxygen consumption and increased fat utilization to compensate for heat loss – that will improve endurance and potentially extend lives.

The viral “Ice Bucket Challenge” that encouraged participants to raise money and awareness for amyotrophic lateral sclerosis (ALS) research has funded studies that led to a recent breakthrough: discovery of a new target gene common in more than 1,000 families with a history of ALS.

Keith Gagnon, PhD, assistant professor of biochemistry and molecular biology at SIU School of Medicine in Carbondale has been awarded a two-year, \$648,728 grant from the Department of Defense (DoD). This grant will allow him to use cutting-edge technology to study a key genetic mutation that causes both ALS, or Lou Gehrig’s disease, as well as a common memory disorder called frontotemporal dementia (FTD). He will be working in collaboration with the High Throughput Bioscience Center at Stanford University to screen more than 100,000 chemicals in search of potential ALS and FTD treatments.

The new study will focus on the most common genetic form of ALS and FTD, which is caused by mutation in the gene C9ORF72. Dr. Gagnon’s lab will develop models of disease based on special signatures from the C9ORF72 gene and



track them at the cellular level with fluorescent imaging. The Stanford center will then use automation to rapidly “read” the biological activity of the models and screen them through chemical libraries in search of potential drug candidates that could ultimately improve patient outcomes. The project is funded by a Therapeutic Idea Award through the DoD ALS Research Program.

How can we stop breast cancer from spreading? Sophia Ran, PhD, received a National Cancer Institute grant to explore the mechanisms that cause the formation of new lymphatic vessels and metastasis in breast cancer.



Ran’s project was initially supported by an SIU Team Science Grant made possible through Simmons Cancer Institute’s Denim & Diamonds Gala.

Ran’s project was initially supported by an SIU Team Science Grant made possible through Simmons Cancer Institute’s Denim & Diamonds Gala.

Clearer views for better hearing

DoD funds new microscope

Auditory researchers at SIU School of Medicine have acquired a new microscope to enhance work in laboratories studying tinnitus (ringing in the ears) and hearing loss caused by toxins, noise exposure or aging. A \$270,000 grant from the Office of Naval Research in the US Department of Defense (DoD) funded the device.

“Researchers will use this tool for educational purposes, including training the PhD and postdoctoral fellows who are studying auditory pathways with us,” said **Brandon Cox, PhD**,

assistant research professor in pharmacology.

The Zeiss Laser Scanning Microscope (LSM) 800 with Airyscan uses light emitting diodes (LEDs) which are more powerful and stable than gas lasers. The Airyscan technology produces a higher resolution called Super Resolution Microscopy. In 2014 the Nobel Prize in Chemistry was awarded to the three developers of super-resolved fluorescence microscopy. The Super Resolution optic process increases clarity of

smaller structures and helps users see separation between two objects that are close together. The Zeiss LSM 800 with Airyscan nearly doubles the field of resolution from the School’s previous confocal microscope, making very small cellular details within the inner ear easier to view.

 View Brandon Cox working with the microscope at bit.ly/CoxResearch