

Waterloo to lead new experiment aboard International Space Station

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A spacecraft carrying supplies for a new physiology experiment led by a University of Waterloo researcher will launch to the International Space Station (ISS) on Thursday, the Canadian Space Agency announced.

Professor Richard Hughson, of the Faculty of Applied Health Sciences and the Schlegel-UW Research Institute for Aging, leads the experiment, which will link changes in astronauts' hearts and blood vessels with specific molecules in the blood to determine why astronauts experience conditions that mimic aging-related problems and [chronic diseases](#) on Earth.

The findings will help identify important indicators for chronic disease and assist with the development of early interventions for people on Earth.

"We know that astronauts return from [space](#) with stiffer arteries and resistance to insulin, conditions affecting many adults as they age," said Professor Hughson. "For the first time, we will be able to track exactly how—and why—the body's [blood vessels](#) change, and use these findings to potentially improve quality of life and the burden of chronic disease."

The new project will build on Professor Hughson's study with Canadian astronaut Chris Hadfield, which first revealed that astronauts' arteries stiffen at a dramatically accelerated rate as a result of spaceflight. Stiff arteries increase blood pressure and the condition has been directly linked to the development of cardiovascular disease.

"In space, astronauts' bodies show aging-like changes much faster than on Earth. The International Space Station provides a unique platform to study aging-related conditions providing insights that can be used to help understand some of the biggest [health issues](#) affecting society," said Hughson. "Our research to date suggests that even though astronauts exercise every day, the actual physical demands of tasks of daily living are greatly reduced due to the lack of gravity. This lifestyle seems to cause changes in the vascular system and in the body's ability to regulate blood glucose that would normally take years to develop on Earth."

His earlier work with Chris Hadfield also revealed that many [astronauts](#) develop [insulin resistance](#) during their time in space. Insulin resistance is a precursor to Type II diabetes, a condition that affects about 2 million Canadians, and 600 million people around the world.

Astronauts participating in the study will provide regular blood samples and conduct ultrasounds while resting and during exercise, before, during and up to one year after flight.

The experiment is one of four new research projects to be run aboard the ISS. The Canadian Space Agency selected the projects for their relevance to medical and health issues stemming from space travel and for the benefit they offer for life on Earth.

The Orbital Sciences Cygnus resupply craft will launch at 5:55 p.m. on December 3, and arrive at the ISS on December 6, 2015. Canadarm2 will capture its arrival. Supplies for an experiment run by a researcher from the University of Ottawa are also on board.

Provided by University of Waterloo

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