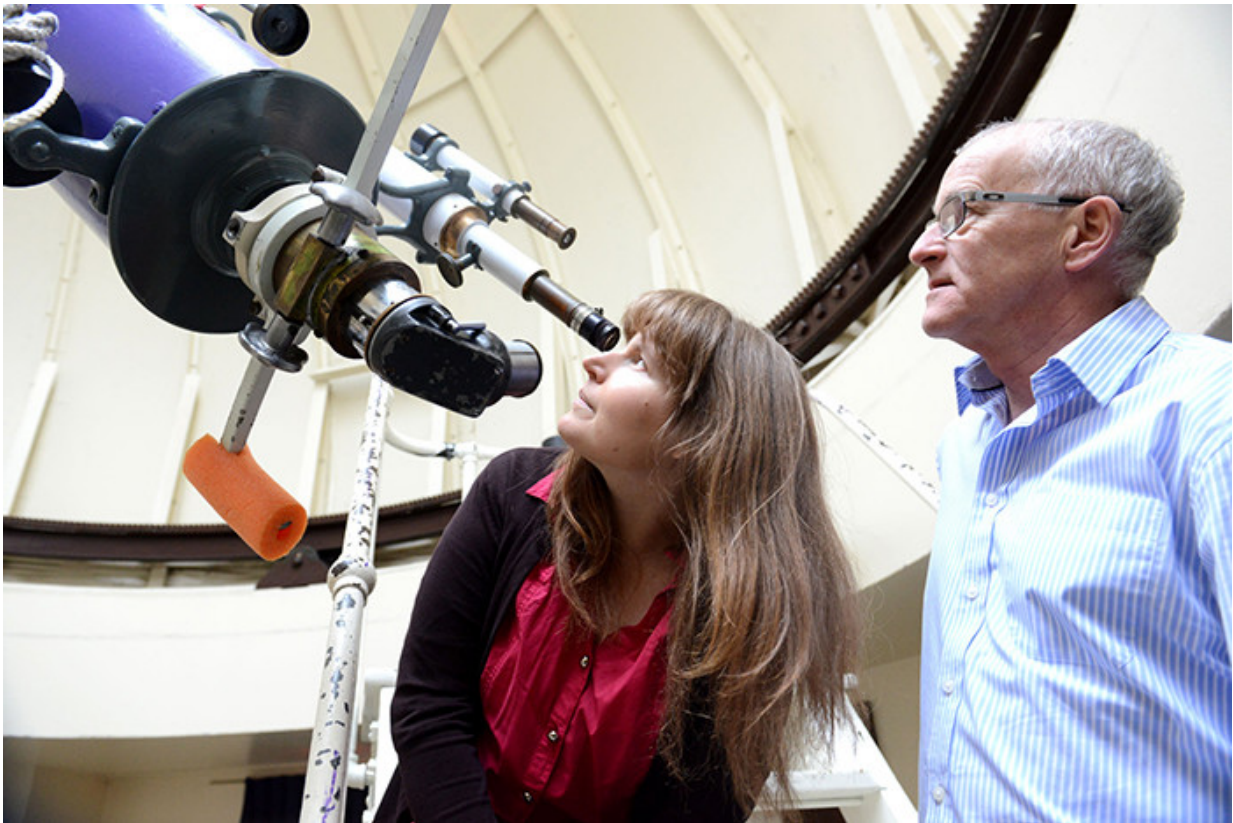


# One small step for the health of female astronauts

April 1 2016, by Jesica Hurst

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The work of Microbiology and Immunology and Surgery professor Gregor Reid and Camilla Urbaniak, PhD candidate, may offer insight into the diets of astronauts, potentially reducing the frequency of health complications for female astronauts. Credit: Tristan Joseph // Special to Western News

In recent films involving space travel, such as *Interstellar*, *Gravity* and

*The Martian*, several female characters have been portrayed as astronauts, commanders and specialists with the capability to endure the same missions as their male counterparts.

However, in reality, there are limitations around the duration of the [space missions](#) female astronauts can take part in due to the serious health conditions they could face, as they have a lower threshold for exposure to [space](#) radiation than male astronauts.

Microbiology and Immunology and Surgery professor Gregor Reid and Camilla Urbaniak, a Microbiology and Immunology PhD candidate, recently studied ways in which the microbiome may influence the health of female astronauts. After reviewing the literature, they have proposed that probiotics and fermented foods should be considered a staple in the astronaut diet to potentially reduce the frequency of these health complications.

"If we can manipulate the microbiome and provide female astronauts with probiotics that could reduce some of the health complications, this may allow them to spend longer time in space," Urbaniak explained. "Female astronauts don't want to be limited in how much time they can spend on space missions."

The health complications female astronauts face are unique and may be more pronounced in space. If, for example, an astronaut were diagnosed with breast cancer, ovarian cancer or a [urinary tract infection](#) one year into a trip to Mars, the management of their condition would be very challenging.

Key concerns during space flights also include rapid bone loss and a compromised immune system. Current research on male astronauts has demonstrated a decrease in beneficial gut, nasal and oral microorganisms during short- and long-term missions, and an increase in pathogens, such

as *Staphylococcus aureus* and *E. coli*. However, similar research on female astronauts has not been conducted.

Bacteria change when they enter space, which unfortunately means the antibiotics normally used to treat some of these health conditions can lose some of their efficacy. Because of this, Reid and Urbaniak suggest providing space crews with small sachets of probiotic bacteria that they can use to prepare fresh fermented food with during the flight – an additional way to maintain the health of these astronauts.

"Space travel changes things about microbes, and, if the microbes involved in astronauts' immune and digestive systems are affected, it can cause these health complications," Reid said. "We almost have to look at the microbiome as an organ – we need to understand how to manipulate the bacteria in favour of health, and reduce the risk of disease."

"Any previous microbiome work has not assessed female astronauts, even though we know women and men have different microbial profiles," Urbaniak added. "There has not been enough work done on women in space, so we hope this stimulates more conversation and more research on the topic."

By studying the effect of microgravity on the gut, oral, breast and reproductive tract microbiota patterns in women, and supporting the beneficial effects of certain bacteria, Reid and Urbaniak believe the National Aeronautics and Space Administration's (NASA) upcoming space missions lasting several years could include more female astronauts.

Provided by University of Western Ontario

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