Paper ID: 27437
oral
student

SPACE LIFE SCIENCES SYMPOSIUM (A1)
Biology in Space (8)

Author: Mr. Jeffrey R. Osborne
University of Toronto Institute for Aerospace Studies, Canada

Ms. Karen Morenz
University of Toronto, Canada
Mr. Alejandro Duque
University of Toronto, Canada
Mr. Priyank Purohit
University of Toronto, Canada
Ms. Brenna Koehler
University of Toronto, Canada
Ms. Lena Faust
University of Toronto, Canada
Mr. Stephen Lau
Canada
Ms. Katie Gwozdecky
Canada
Mr. Ben Makarchuk
Canada
Mr. Tareq Deaibes
Canada

GROUND-BASED RESULTS ON THE DEVELOPMENT OF A MICROFLUIDICS-BASED SMALL SATELLITE TO EXAMINE THE EFFECTS OF MICROGRAVITY ON CANDIDA ALBICANS AND CANDIDA GLABRATA.

Abstract

A fundamental understanding on the degenerate health effects of long-duration space travel on humans remains elusive. The microgravity environment of space have profound impacts on human health, both in terms of human immune response, as well as behaviour of human pathogens.

The University of Toronto Aerospace Team (UTAT) Division of Space Systems is participating in the Canadian Satellite Design Challenge (CSDC). As part of this, UTAT is developing a unique platform for in-space astrobiology research using the CubeSat standard. The objective for this research is to examine the effect of microgravity on the gene expression of various pathogenicity related genes, and minimum inhibitory concentration of various drugs for C. albicans and C. glabrata, two opportunistic fungal pathogens which are a natural component of human gut flora.

This paper will discuss the ground-based work that has been accomplished in developing this platform. This will include the design for a high-data-throughput microfluidics-based payload for in-space astrobiology research, as well as a novel means of placing C. albicans and C. glabrata in no-power, long-duration stasis.