PROJECT MERCCURI: Microbes in Space

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ABSTRACT

Some bacteria grown in microgravity have previously been shown to exhibit different morphological and metabolic capabilities than when grown on Earth. As part of Project MERCCURI´s aim to increase microbiological outreach, we sampled at various high-population sporting venues and sites of historical interest nationwide for 48 strains of BSL 1 bacteria. After we grew these bacteria in culture, the 48 strains will be flown to the International Space Station to be "raced" against parallel plates on Earth. We will measure each well´s absorbance at 9 different points in each well, every 15 minutes for 96 hours, to compare growth curves generated by a recently installed microplate reader in the International Space Station to those on Earth. Future studies will focus on the bacterial strains that show differences in growth rates when exposed to the microgravity environment. Ultimately, not only do we aspire to expand current knowledge of microbiology in space, but we also intend to raise awareness and ignite the interest of the general population in microbiology and in science

Founder of scistarter.com and Science Cheerleader, Darlene Cavalier, sampling the Liberty Bell.

Sampling the Heart Exhibit at the Franklin Institute.

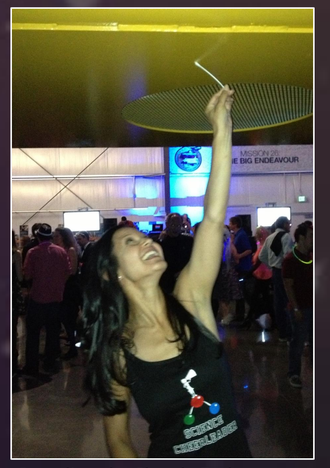
OUTREACH

- **Citizen-scientists** and **Science Cheerleaders sampled** venues (i.e., Liberty Bell, sports stadiums), cell phones, and shoes **across the United States**
- Large, diverse sample of **microbial ecologies**, by process of 16S rRNA PCR sequencing
- Promoted an **active, hands-on approach** with the scientific process, bringing a **direct awareness** to the **microbes all around us**

MICROBIAL SPACE RACE

- **48 hand-picked, non-pathogenic bacteria strains** from **venues** across the nation
- 96-well **parallel plates** run on Earth and the ISS
- **Six copies** of each strain
- **Absorbance readings** from identical ISS and Earth microplate readers
- **"Raced"** each other, measured by **growth kinetics** (speed, density, etc.)

Sampling Buzz Aldrin´s shoe.



Sampling the Shuttle Endeavor.

Science Cheerleader, Kayla, sampling Candlestick Park (SF 49ers).

WHY MICROBES IN SPACE?

Studies have found that some species of bacteria grow differently in space than on Earth. Project MERCCURI, one of the Space Florida International Space Station (ISS) Research Competition winners, aims to (1) compare bacteria strains grown on Earth with bacteria grown on the ISS by utilizing direct involvement from citizen-scientists, and (2) assess bacterial communities found on the ISS.

Wendy Brown ready to launch microbial sampling kits into the stands at a 76ers game.

microBEnet

scistarter.com

SCIENCE CHEERLEADER

ALFRED P. SLOAN FOUNDATION 1934

SPACE FLORIDA

UCDAVIS UNIVERSITY OF CALIFORNIA