

CURRICULUM VITAE

ZACHARY K. GARVIN

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EDUCATION

Ph.D. Student, Geosciences (September 2017-)
Princeton University, Princeton, NJ

Sc.B., Microbiology/Immunology with Honors (May 2017)
Brown University, Providence, RI

Relevant Courses: Microbiology, Virology, Experimental Evolution, Organic Chemistry, Genetics, Advanced Biochemistry, Biostatistics, Planetary Geology, Earth: Evolution of a Habitable Planet, Terrestrial Biogeochemistry

RESEARCH INTERESTS

Primary interests are in the field of geomicrobiology as applied to the study of extremophilic organisms and astrobiology. Broad research goals are to characterize modern terrestrial analogs for extinct or extant microbial life on the early Earth, Mars, and other potentially-habitable bodies within the Solar System. Laboratory research has been driven by traditional microbiology along with modern -omics and analytical chemistry techniques in order to explore the biochemistry and evolutionary histories of microbes in the environment.

RESEARCH EXPERIENCE

Undergraduate Researcher, **Brown University** (2016-2017)

Advisor: Dr. Yongsong Huang

Developed suboxic peat incubations to promote and observe the growth of the unidentified brGDGT-producing bacterium (skills developed: accelerated solvent extraction, column chromatography, acid hydrolysis of lipids, HPLC-MS)

Undergraduate Research Assistant, **Brown University** (Summer 2016)

Advisor: Dr. Yongsong Huang

Determined the relationship between various soil properties and bacterial brGDGT lipid distributions in U.S. soils for improved paleoclimate reconstructions (skills developed: HPLC-MS, factor analysis, multiple linear regression, R statistical programming)

Biochemistry Course Student Researcher, **Brown University** (Spring 2016)

Advisor: Dr. Gerwald Jogl

Participated in the first trial semester of a research-based Biochemistry laboratory course for the determination of the enzyme kinetics of a thermophile-derived β -galactosidase under varying reaction conditions (skills developed: affinity chromatography, BCA assay, enzyme kinetics assay, Chimera protein structure analysis)

Research Intern, **NASA Goddard Space Flight Center** (Summer 2014, 2015)

Advisors: Ms. Melissa Floyd, Dr. Alexander Pavlov, supported by Dr. Paul Mahaffy

Investigated the survival and potential growth of an extremophilic bacterial community in a simulated Martian environment (skills developed: microbial culturing, cell recovery from soil, bacterial staining, operation of Mars Simulation Chamber)

PROFESSIONAL PRESENTATIONS

Garvin, Z. K., Huang, Y. Inducing the bacterial production of brGDGT lipids in a suboxic peat environment. Presented at the Brown University Undergraduate Honors Thesis Oral Presentation Forum, May 1, 2017.

Garvin, Z. K., Huang, Y. Inducing the bacterial production of brGDGT lipids in a suboxic peat environment. Presented at the Brown University Institute at Brown for Environment and Society Senior Research Poster Presentation Event, April 28, 2017.

Garvin, Z. K., Floyd, M. Life on Mars: extremophilic bacteria in a simulated martian environment. Presented at the NASA Goddard Summer Intern Poster Competition, July 30, 2015.

Floyd, M., Pavlov, A. A., **Garvin, Z. K.** Growth of microorganisms from an extreme earth environment in a Mars simulation chamber. Presented at the NASA Goddard Science and Exploration Directorate Science Seminar Series, September 24, 2014.

HONORS AND AWARDS

Sigma Xi, Brown University Chapter, Associate Membership (2017)

Inducted into the Brown University Chapter of the Society of Sigma Xi for a high level of competence in science and demonstration of significant scientific research

Brown University Voss Undergraduate Research Fellowship (2016-2017)

Fellowship awarded by the Institute at Brown for Environment and Society to support environmental research to be completed for a senior honors thesis project

NASA Goddard Space Flight Center Intern Poster Competition, 1st Place (2015)

Awarded 1st place among all NASA Goddard interns in the science category for summer research poster presentations (title: "Life on Mars: Extremophilic Bacteria in a Simulated Martian Environment")