Research Experiences for Undergraduate (REU) project: Impact of production system on soybean microbiome

Mentors: Frances Trail (Professor) and Gregory Bonito (Assistant Professor), Michigan State University

Project description: This REU project is based on Michigan State University’s main campus in East Lansing, MI. There, the student will work on a project aimed at characterizing leaf, stem and root microbiomes of crops in a wheat- maize-soy rotation under three production systems: conventional, organic, and no-till. The overall project goal is to understand the impact of production systems, plant species, and chemical inputs on the assembly and function of the plant and soil microbiome. The data will be used to construct networks of microbial communities, that will reveal beneficial microbiomes specific to plant tissues, growth stages and management regimes.

This REU will combine both field and lab experiences. The student will obtain a library of fungal and bacterial isolates from soybean roots, shoots and leaves. These will be DNA-sequenced for identification, archived, and the student will perform experiments on microbiome interactions that may affect plant health. Field work at the Kellogg Biological Station (about an hour from MSU main campus) will include collection of soybean plants and preparation of samples for microbiome analysis. The student will also gain exposure to bioinformatic analyses of plant microbiome data in the Bonito and Trail labs on MSU’s main campus. This collaborative project will allow the student to work as part of an exciting interdisciplinary team.

Fellowship details: The position will be for 11 weeks, from May 21 – August 3, 2018. This research-intensive fellowship will take place at MSU in East Lansing MI. The student will need to find housing on campus or nearby campus. The student will work on average 40 hours a week and receive a stipend of $8000 to cover housing, living expenses, travel to MSU, and up to $500 in research supplies. The stipend will be paid in two payments, June 15 and July 15, 2018. Travel to the sampling stations will be covered by the mentor’s lab.

The student will be responsible for 1) meeting all requirements of their mentor, 2) writing a blog post about their research for the KBS LTER website, 3) attending a professional development seminar at KBS on creating research posters on July 10, and 4) presenting a professional research poster at the KBS summer research symposium on August 1, 2018 at KBS.

This project is funded by the National Science Foundation’s Kellogg Biological Station Long-term Ecological Research (KBS LTER) program. Priority will be given to non-MSU students who may not have many research opportunities at their college or university and under-represented minority students. Please note, students must be a U.S. citizen to apply.

The ideal candidate will have already taken a college-level introductory biology course and lab, be enthusiastic about learning and research, be able to think and work independently, and be open to providing and receiving constructive feedback. We hope to continue working with the student after the summer experience to publish a paper on their findings. We are excited about
mentoring an undergraduate student this summer!

Apply by sending CV or resume, unofficial transcript, and a 1-page statement of interest describing why you are excited about this opportunity and what makes you an ideal candidate to Dr. Trail at trail@msu.edu. Apply by March 1, 2018 for full consideration, applicants will be accepted through March 15th, 2018. Please email Dr. Trail trail@msu.edu with any questions.