Announcement - new class Fall 2019/Spring 2020

Science Education Alliance - Phage Hunters Advancing Genomic and Evolutionary Science I

Instructors: Profs. Susanne Pfeifer & Kerry Geiler-Samerotte
Time: T Th, 12:00-1:15pm (Lecture) & 1:30-4:00pm (Lab)
Credits: 6 credits per semester

Description:
Part I of a year-long laboratory course in which undergraduate STEM majors actively engage in research to discover (Part I), isolate (Part I), and computationally analyze (Part II) bacteria-infecting viruses (i.e., bacteriophages). At the end of the academic year, a selection of students will be able to present their results at the national SEA-PHAGES symposium, held at the Howard Hughes Medical Institute’s Janelia Research Campus, VA.

Objectives (as per HHMI website):
The course is designed to provide students with an authentic research experience, where students gain a sense of ownership of the scientific problem and of the discoveries made. In particular, the course provides:

an Opportunity for Critical Thinking
- Data analysis and interpretation
- Experimental design
- Reading and analysis of primary literature
- Understanding applications of mathematical modeling in problem solving

an Introduction to Scientific Skills
- Aseptic technique
- Microbiology
- Molecular biology
- Electron microscopy
- DNA sequencing
- Comparative genomic analysis
- Functional genomic analysis
- Genome annotation

an Opportunity for Professional Development
- Effective presentation of research
- Networking with other SEA participants
- Dissemination of research findings including co-authorship on peer-reviewed publications and submissions to genomic databases
Topics covered in Part I:

Field work:
- Sample collection field trip

Wet-lab work:
- Isolation and purification of phages from the environmental samples
- Amplification of the purified phages
- Isolation of phage genomic DNA
- Restriction digest analyses of genomic DNA samples
- Visualization of phage morphology by electron microscopy
- Preparation of phage DNA for sequencing and phage lysates for archiving

Critical thinking:
- Creation of hypotheses about the diversity of phage in Arizona
- Collection of data used to test hypotheses
- Preparation of data in publication format

Questions? Contact us at susanne.pfeifer@asu.edu or kerry.samerotte@asu.edu