Pharmacology Immersion Program (PIP)

Our SURF Program also features a 4-day, intensive enrichment program, the Pharmacology Immersion Program, or PIP, which is directed by Pharmacology & Therapeutics faculty member and SURF Mentor, Dr. Dan Wesson. The PIP takes place during the early portion of the summer session and consists of a four-day immersive lecture, discussion, and laboratory methods program for the Fellows. It is designed to accomplish three overall goals: 1) render a general knowledge base of fundamental concepts in Pharmacology; 2) provide hands-on experience with methods commonly used within the multiple disciplines and experimental approaches within Pharmacology; and 3) facilitate engagement of students with primary faculty and other graduate students and post-doctoral trainees in the Department of Pharmacology & Therapeutics.

The PIP is organized into four successive daily themes, each consisting of modules focusing upon different research approaches common to the discipline of Pharmacology (see full PIP schedule below). Each module is led by faculty members in the Department of Pharmacology & Therapeutics who engage fellows in the concepts and methods relevant in their expertise. This includes a short engaging lecture on the methods, the faculty member’s goals, and an emphasis on their historical origins to increase appreciation of the fellows for innovation. SURF Fellows are expected to participate in the lectures by asking questions and were encouraged to consider how they may possibly incorporate these methods and approaches into their future education and careers. Following the lectures, Fellows were given practical experience with the approaches in faculty laboratories, hosted by the faculty as well as lab personnel.

**Day 1**
**Gene Expression and Cellular Localization**
Module 1 - morning session (Law Lab)
- Affinity chromatography
- Western blot
Module 2 - afternoon session (Munger Lab)
  - *in situ*/RNAscope
  - immunohistochemistry

**Day 2**
**Cellular Identity and Imaging**
Module 1: Study Break
Module 2 – afternoon session (Martens Lab)
- Fluorescence microscopy and analysis

**Day 3**
**Gene Therapy and Manipulation and Methods for Screening Drugs**
Module 1 – morning session (Rodriguez Lab)
- Crispr/Cas9, RNAi
Module 2 – afternoon session (Urs Lab)
- Cell transfection and protein-protein Interactions

**Day 4**
**Physiological and Behavioral Measures**
Module 1 – morning session (Wesson Lab)
- Physiological measurements during behavior
- Single-unit recordings, Ca^{2+} imaging
Module 2 – afternoon session (Levitt Lab:)
- Intracellular physiology
- Viral vector production and use

Major components of the PIP are to conceptualize lectures as foundations for what Fellows would be participating in within the laboratory. Fellows are provided with reading material prior to the lectures to help prepare them in a given module’s subject matter. The modules have been developed so that Fellows are not required to disturb or handle any research animals in the course of this program.