



Research In Progress Seminar

**Tuesday, February
14, 2017
2:00PM**

**Location: The Fishbowl,
2120 Biological Sciences 3**

Speakers:

Logan Harriger & Sean
Horan, MCSB PhD
Program &
Mathematics

Talk Title:

Using macroscopic brain
networks to determine
seizure focus

Abstract:

Epilepsy is one of the most common neurological disorders. It is estimated around 5% people will develop epilepsy at some point in their life. In 30% of these cases, the patient will not respond to anti-epileptic drugs, and may become a candidate for surgical intervention. The resection of epileptic tissue is a risky procedure that critically depends on the accurate localization of the seizure focus. In this study, patients with a medically intractable epilepsy were monitored with intracranial electrodes during ictal (seizure) and inter-ictal (non-seizure) periods. For each patient, we define a dynamic network over the electrodes based on windowed cross-correlation. By computing various graph theoretical measures, we characterize the difference between seizure and non-seizure networks. Furthermore, we use this network connectivity to define interaction strength between units in simulations of a dynamical system that models some basic phenomenology of epileptic activity. After identifying which electrodes are most critical to ictal periods, we model treatment, by removing nodes and re-simulating the system.

Questions:

Please
contact Naomi Carreon at:
ncarreon@uci.edu or Kerrigan
Blake at: kerrigab@uci.edu