



EMMANUEL COLLEGE

The Center for Science Education



SUMMER 2014

Mathematics, Science and Technology

Two Day Biomedical Research Institute for High School Students

Monday, June 30 & Tuesday, July 1, 2014

This biomedical research institute is designed to introduce High School rising juniors and seniors to current areas of research in biomedical fields. The modules will be taught by current Emmanuel College science faculty members. This is a two day program, 9:15 a.m. to 3:15 p.m.

High School students will become engaged participants in current research projects ongoing at the College. This is a unique opportunity to expand student experiences in science to those with an active interest. A registration fee of \$35.00 will be required. A certificate of completion will be awarded to all active participants.

REGISTRATION DEADLINE MAY 31ST

MODULE I

Evaluating Animal Models of Neurodegeneration: The Scientific Method in Practice

We know a lot about human responses to stress, pain, drugs and sleep deprivation. Much of this information has come from studies using animal models. This is increasingly the case with animal models of neurodegenerative diseases. Indeed, the use of animals in research has been the norm for generations of scientists and is often preferred for the application of the Scientific Method. Despite this fact, there is a lot of uncertainty about how this process takes place in the lab. This module will emphasize the Scientific Method as students are guided through the process of live animal behavioral research. All participants will have the opportunity to explore tools used routinely in behavioral Neuroscience to help them support or refute hypotheses that they will make and test on an animal model of a neurodegenerative disease.

Instructor: Michael Jarvinen Ph.D., Associate Professor of Psychology

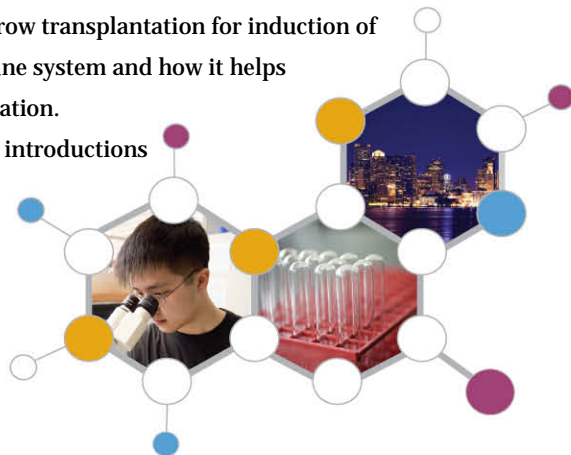
MODULE II

Transplantation: The Basic Science, Clinical Implications, and Surgical Techniques (and How to See All Three While at Emmanuel College)

This module will introduce students to the applied medical research field of bone marrow transplantation for induction of tolerance and treatment of cancer. We will discuss the biological makeup of the immune system and how it helps the body to fight off infections and why this makes it complicated for organ transplantation.

Students will also learn some basic surgical techniques (suturing on gloves), as well as introductions to some of the experimental techniques used (flow cytometry) using a small animal model. Students will be using mouse tissue for lab work.

Instructor: Josef Kurtz, Ph.D., Associate Professor of Biology



MODULE III

Swallowing the Surgeon: Nanotechnology, Chemistry, and Medicine

Early thoughts about the field of nanotechnology asked if it would one day be possible to “shrink a surgeon” and send that doctor into a human body to do work. While this isn’t exactly possible, exciting advances in nanotechnology are getting us closer to materials that can perform multiple functions. This module will include an introduction to nanotechnology and the chemistry behind it all. Further emphasis will be placed on bionanotechnology and the applications of nanotechnology to medicine. This will include discussions as well as hands-on experiments with metal nanoparticles and quantum dots used in medical imaging experiments.

Instructor: Aren Gerdon, Ph.D., Assistant Professor of Chemistry

MODULE IV

Why Do Scientists Study Worms?

Study the relationship between environmental stimuli and complex behaviors using the worm *C.elegans*

Instructor: Liliana Busconi, Ph.D., Lecturer in Biology

Enrollment is restricted to 20 per class and is on a first come, first served basis. To register please complete the following form. **If paying by check, mail to:**
Diane Bissaro, Emmanuel College, 400 the Fenway, Boston, MA 02115 bissardi@emmanuel.edu

Please register me for the **Two Day Biomedical Research Institute for High School Students**
Monday, June 30 & Tuesday, July 1, 2014 Registration fee \$35.00

REGISTRATION DEADLINE MAY 31ST

NAME _____

STREET ADDRESS _____

CITY _____ STATE _____ ZIP _____

PHONE _____ E-MAIL _____

SCHOOL _____

CREDIT CARD# _____ Exp. _____

SIGNATURE _____

Fax to 617-975-9304 to Diane Bissaro

Or make check out to Emmanuel College and mail to:

Diane Bissaro, Emmanuel College, 400 the Fenway, Boston, MA 02115 bissardi@emmanuel.edu

