



JHU DEPARTMENT OF
IOPHYSICS
UNDERGRADUATE NEWSLETTER

Fall 2010

Biophysics Mentoring Program

The Biophysics Mentoring Program is designed to connect students considering the Biophysics major with current Biophysics majors. If you are interested in learning more about biophysics, and would like to hear a current student's perspective, email Dr. Fleming (karen.fleming@jhu.edu) to sign-up for the Biophysics Mentoring Program. She will connect you with a current student, so that you can learn more about the major, ask any questions you may have and get inside advice from current majors. All mentors and mentees meet at least once a semester as a group as well as communicate throughout the semester.



Above: Emily Holthaus ('11), a Biophysics Mentor, flashes a smile. She says that she chose Biophysics because of the closeness of the department and amazing professors.

Undergraduate Research Guidelines

Students often ask many questions regarding independent research. How do I contact professors? What kind of research satisfies the Biophysics major requirement?

To make the process easier for undergraduate students, Dr. Karen Fleming, the Director of Undergraduate Studies, has assembled a comprehensive online guide for students. The guide elucidates key procedures for obtaining research credit and explains the Department's research philosophy.

<http://biophysics.jhu.edu/research.html>



Above: Leanna Owen ('12) poses with her advisor, Dr. Karen Fleming, at the most recent Undergraduate Pizza Party!

Course Profile

Biophysics 250.345

Cellular and Molecular Physiology

Taught by Richard Cone, Ph.D.

Cellular and Molecular Physiology starts with the role of diffusion in cellular physiology and goes on to cover molecular motors, speeds of cellular and organismic processes, cellular membranes, sight, hearing, and osmosis. The class is taught in a very interactive manner – some of the problem sets even include at-home experiments and optical illusions. Students are encouraged to “study nature, not books.” Dr. Cone explains, “I think my Cellular and Molecular Physiology course provides some broader contexts and perspectives for thinking about how molecules and cells function.”



Above: Students mingle with faculty.

Update From a Young Alumni

Name: Neil Neumann

Hometown: Des Moines, Iowa



Neil Neumann graduated from Johns Hopkins University in 2009 and is currently pursuing the combined M.D./Ph.D. program at The Johns Hopkins School of Medicine.

Why Biophysics?

I wanted something more out of my undergraduate education. I wanted to learn how to think and to learn the basics of biomedical science. Before I was Biophysics, I was a Biology major and was dissatisfied with what they were offering and felt that Biophysics offered a more rigorous education. I took biophysical chemistry with Dr. Barrick and really enjoyed it and decided to switch into Biophysics after that.

Where do you see yourself in 10 years?

Most likely I will be in my residency doing internal medicine at an academic hospital. I will probably be trying to specialize in cardiology, hematology, oncology, or endocrinology.

Do you have any advice for Biophysics undergrads?

Current: take as many interesting courses as you can because there will be few times in your life where you can really study the basic sciences at this level. Don't be afraid to take courses that are out of your comfort zone because that's part of the learning process.

People looking to be Biophysics: try some of the courses and I'll think you'll be surprised. There's no reason to be afraid of the quantitative aspect of the courses because with the help of the professors you can really learn a lot.

What was your favorite aspect of the program?

The computer lab. All the students getting together and studying there late at night for Wave Phenomena and Biological Physics. Also the free printing. It was clutch. In addition to those: some great aspects were the professors, who are some of the best at the University, the students and the small size of the program. It allowed for one on one mentoring from professors.

Other Alumni

Leanne Stunkel ('08) published a paper in the July/August 2010 issue of *IRB: Ethics and Human Research*. She is at Weil Cornell Medical College and says her first med school exam was a lot easier due to the Biophysics Computational Biology course she took at JHU.

Undergraduate Spotlight

Name: Justin Silverman ('11)

Hometown: Los Angeles, CA & Toronto Ontario



During the Summer of 2010 I joined a research/medical relief mission to region 9 in southwestern Guyana. Region 9 is on the eastern border of Guyana, bordering Suriname. Our focus was largely on two Amerindian communities on the banks of the Corentyne river as well as a small town (more urbanized by comparison) called Corriverton. The team consisted entirely of physicians based out of Toronto, except for a nurse, an echocardiographer, a medical student, an ex-soldier and myself.

While the mission involved a great deal of clinical patient care, my primary goal was to assess the prevalence of Diabetes and Hypertension in various Guyanese communities. Based on trends in other Caribbean and South American countries, we expected to see unusually high rates of Diabetes and Hypertension. The theory is that the increasing urbanization of Guyana (specifically in these Amerindian villages) brings with it high caloric diets containing little nutritional value. This does not seem so out of the ordinary, however it appears that certain ethnicities are especially sensitive to these dietary changes. It appears that in some young children who are raised on low caloric diets due to poverty, the metabolism adjusts to become very efficient and waste as little energy as possible.

As the community becomes more affluent and food more plentiful, later in life, increases in caloric intake lead to high rates of central obesity, which seem to be tied to Diabetes and Hypertension. I am currently analyzing the data that we collected while in Guyana. This data will be used by the Guyanese government to focus the priorities of future public health campaigns.