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Faculty Spotlight: Yehuda Ben-Shahar

Dr. Yehuda Ben-Shahar joined the Biology Department at Washington University in 2008. He is originally from the Tel-Aviv area of Israel. He completed his undergraduate degree in “Life Sciences” (Biology) at Tel-Aviv University; and completed Master’s and PhD degrees in entomology at the University of Illinois in Urbana-Champaign where he studied genetic and molecular analysis of honey bee behavior. He completed his post-doc through an HHMI Fellowship at the University of Iowa College of Medicine where he researched Drosophila genetics and studies on human lungs as chemosensory organs. Research at the Ben-Shahar Lab at Wash U focuses on understanding the hyper-reactivity of lung response to chemical stimuli which can be applied, for example, in the case of asthmatics reacting strongly to perfumes. These studies are in collaboration with Wash U Medical School’s Division of Pulmonary and Critical Care. The research supports that the lung reacts directly to the chemical compounds. The lab also uses fruit flies (Drosophila melanogaster) as a subject in studies of the neural and genetic bases for behavior.

In addition to the Danforth Campus laboratory, the Ben-Shahar Lab keeps colonies of bees at Tyson Research Center. Mostly run by undergraduates, the research at Tyson aims to understand aspects of the complex division of labor in European honey bees (Apis mellifera) by analyzing genetic and genomic bases for their behavior. They are trying to determine the genetic factors at play, affecting transitions between different tasks as the bees age.

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**Course Spotlight**

**Bio 4831: Green Machines: Plant Physiology, Growth & Bioenergy**

This new course introduces students to the fundamentals of plant physiology and biochemistry and provides a broad overview of the flow of energy captured from sunlight during photosynthesis, in plants and microbes. The first half of the course, taught primarily by Barbara Kunkel, focuses on the biochemical, cellular and physiological processes regulating how plants grow, metabolize and respond to their environment. Topics covered include water and mineral uptake and transport; source-sink relationships; long-distance transport of carbon and nitrogen; cell growth and expansion; physiological responses to changes in the environment and interactions with other organisms. The second half of the course, taught by Himadri Pakrasi, covers photosynthesis and bioenergetics and explores current approaches for utilizing the metabolic potentials of plants and microbes to produce biofuels and other valuable chemical products. An overall emphasis is placed on the use of large-scale genomic, transcriptomic and metabolomic datasets in biochemistry. The topics covered also include central metabolism, structure and degradation of plant lignocellulose, and microbial production of liquid alcohol, biodiesel, hydrogen & other advanced fuels. Note: Students interested primarily in the material covered in the second half of the course, should enroll in Biol 4830 (offered during the second half of the Spring Semester). Prerequisites: Biol 4810 or permission of instructor. Small class. Credit: 4 units (area A).

**Bio 4031: Biological Clocks (revived course)**

Overview: Biological clocks are the endogenous oscillators that coordinate physiological and behavioral rhythms in nearly all organisms. This course examines how these rhythms are generated and regulated. The material will include molecular, cellular and systems physiology and the relevance of biological timing to ecology and health in everything from protozoans to plants to people. Workload: Assignments—written assignments follow most lectures to prepare you for the exams. Experiment—you will document your biological rhythms in a short scientific paper. Final paper—you will critique a recent paper in a minireview of a hot topic in chronobiology. Taught by Erik Herzog. Prerequisites: Bio 3050. Medium-size class. Credit: 3 units.

Objectives: Students in Biological Clocks should have three major objectives: 1) to learn about the molecules, cells and systems of biological timing systems; 2) to master reading scientific literature with a critical eye; and 3) to execute and interpret an experiment on human biological rhythms. BIO 4031 students will work additionally on scientific writing skills.

**Biology Club: Announcements and Upcoming Events**

Thanks to all who attended the meeting in September! We introduced the officers, discussed the club’s general function, and worked out a few details about time and prospective events:

**Officers**

Sophia Li -- senior biology & anthropology major
Dan Feng -- senior anthropology major & biology and German minor
Angie Gao -- junior biology major
Ira Blau -- junior East Asian Studies major

—cont’d on page 3
Definite Events

Monthly faculty lunches: Every month, we invite a distinguished faculty member from the undergrad bio department or the med school to join us for a free lunch and casual conversation about their work. Typically, we have spots for ~10 students. We try to get a good mix of the biological subdisciplines, and suggestions for particular professors or fields are always welcome! If we manage to get a lunch speaker for a particular month, we will email you the date, time, and location at least a week in advance. RSVP within a few days of the event to reserve your FREE LUNCH spot!

Cold Spring Harbor Laboratory recruiting session: Every year, a representative from Cold Spring Harbor comes to talk to us about the Laboratory’s summer research fellowship program for undergraduates. For those who don’t know, CSHL is home to the world-renowned Watson School of Biological Sciences (founded by James Watson) and an EXCELLENT place to do mentored research in the basic bio/biomedical sciences. The date of the talk is not yet determined, but it will take place on a Tuesday, Wednesday, or Thursday evening in October at about 5:30-6:00p. We will have FREE PIZZA, and we will likely invite a student who worked at CSHL last summer to share his or her experiences!

Tour of Anatomy Lab at the WashU School of Medicine: Led by current WashU med students! We get a one-hour tour of the awesome anatomy teaching lab, complete with cadavers and dissections in progress. This will probably happen in spring semester.

Potential (Suggested) Events

- Visit/Tour of Missouri Botanical Gardens
- Tour of the Genome Sequencing Center
- Biology movie nights. + FOOD! Please email us any suggestions!
- Student research panel—many club members are interested in pursuing research so we may invite a group of undergrads with previous research experience for lunch. Logistics are the same as for the faculty lunches.
- Group travel to talks at the medical school. If you hear of any interesting talks, email them to us so that we can share them with the rest of the club!

Service activities? ... Peer advising / tutoring? ... ____? As always, we are open to any new ideas! We have quite a lot planned this year. Email wubioclub@gmail.com for questions/info. Hope to see more of you at events and meetings!
Student Affairs Office: Visit Plant Growth 105 to...

- Declare a Biology major or minor and get a Biology Advisor
- Sign up for shadowing classes such as MedPrep, PEMRAP or CAREm
- Request HIPAA online training
- Sign up for the Neuroscience Track and/or BIO 404 waitlists
- Pick up general information and/or ask questions about Biology courses

Jessica Ochoa
Biology Registrar
jochoa@biology2.wustl.edu

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Student Coordinator
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Do You Have...

An announcement you’d like to make?

An interesting story or fun fact you’d like to share?

A professor or course you’d like to suggest for a spotlight?

We want your input! Send ideas and information to:
gerrity@biology2.wustl.edu

Summer Research: Wash U Biology students get hands-on experience at the Medical School

This past summer I conducted research in the laboratory of Dr. Tamara Hershey, at Wash U medical school, studying Parkinson Disease (PD) and subthalamic nucleus Deep Brain Stimulation (STN-DBS). STN-DBS is commonly employed as a form of treatment in PD patients whose symptoms are unresponsive to medication and previous research has shown that while STN-DBS is able to reduce the motor symptoms of PD, it may also produce adverse mood and cognitive effects in such patients. The goal of my summer project was to investigate the relationship between the location of active STN-DBS contacts and acute mood changes in PD. The preliminary results I obtained suggest that the effects of STN-DBS on mood in PD are related to the location of active STN DBS contacts. In addition to learning a lot about PD, my project provided me with a better sense of how to formulate scientific questions and generate scientifically sound hypothesis, as well as how to apply critical thinking skills and creativity to rigorous scientific problems. Research has been an integral part of my education at Washington University and I think it is a challenging and worthwhile pursuit that I would recommend to all undergraduate students!—Viktor Ekuta

I have been involved with diabetes clinical research at Wash U medical school since my freshman year. Most recently, I participated in the ASPIRE program (a clinical research summer internship), during which time I developed my own clinical research study--Social Networking and Peer Support in Adolescents with Type 1 Diabetes (SNAPS). The primary aim of this study is to improve the management of diabetes, and the secondary aim is to increase patient quality of life. Each participant in the study will receive an anonymous Gmail account and will be paired with another participant based on gender and age. The idea is that the pair will form a support system for one another. Over time, I will monitor how well the participants manage their diabetes and will assess how these email interactions affect their perceived quality of life. I discovered clinical research through interactions with the doctor that is currently my sponsor for SNAPS. I knew I wanted to get involved with his area of research, so I asked to join his team. I am extremely glad that I decided to do clinical research because it has enriched my educational experience. I have learned how to fully construct a study from a simple idea, and I have had the opportunity to aid other studies, shadow physicians, and gain insight into my future career. I would highly recommend that anyone who has an interest in research or the field of medicine find a mentor and allow research to become a valuable part of their undergraduate experience.—Jennifer Lapp
Faculty Spotlight: Yehuda Ben-Shahar continued—Dr. Ben-Shahar teaches Bio 3422: Genes, Brains and Behavior during fall semesters. He enjoys teaching the course because he is able to give an historic perspective while keeping students up to speed with modern research by assigning readings from current peer-reviewed papers. The topics and concepts for the class stay the same while discussions are always fresh with exciting discoveries and new techniques. This course is geared toward Juniors and Seniors with some background in genetics and preferably molecular biology, and who have completed Bio 2960 and 2970 (Principles of Biology I and II). It is an instrument for teaching modern concepts of advanced genetics by building on 2960 and 2970 with more detail and applications for modern genetics. The course consists of lectures and discussions and is worth 3 credits. Dr. Ben-Shahar also teaches Bio 1810: Freshman Seminar in Imaging Sciences (a series of talks on the modern uses of various imaging technologies such as light microscopy, MRI, CT, etc., in biomedical research) and is a Bio 200/500: Independent Study mentor.

In his free time Dr. Ben-Shahar loves to spend time with his family. He also likes looking for cool old science books in used bookstores, and fossil hunting with his son (especially for trilobites!).

Volunteer Opportunities: K12 Connections

K-12 Connections is a great way to learn about volunteer opportunities assisting K-12 field trips to WU and other locations, one-time volunteer projects in schools, and other opportunities to support K-12 students and discover public schools in St. Louis.

K-12 Connections seeks to connect Washington University students, staff, and faculty with volunteer opportunities in high-needs urban school districts in the St. Louis area. Volunteers are trained and “on-call”: as opportunities arise in schools, you’ll be notified and can sign up for anything that works in your schedule—there is no minimum commitment. Throughout the year, you are encouraged to attend specialized workshops and training sessions to learn more about St. Louis schools and about effective involvement in high-needs districts. By signing up for the K-12 Connections listserv, you’ll also be informed about special events or public lectures being held on campus related to urban education. For more information go to: http://communityservice.wustl.edu/k12/.

More Biology Jobs on Department Website: http://www.nsclc.wustl.edu/research.html

Volunteer Opportunities: subscribe to the Community Service Connection, an email newsletter: http://www.communityservice.wustl.edu/csconnection/
Biology Department Calendar

Links to General Calendars and Regular Events:

Washington University Record Calendar:  http://record.wustl.edu/calendar

Biology Department Seminars, Mondays, 4:00pm, Rebstock 322, check the website for topics/schedule:  http://www.biology.wustl.edu/seminars/nextsemester.html

Evolution, Ecology, & Population Biology Seminars, Thursdays, 4:00pm, Rebstock 322, check the website for topics/schedule:  http://www.biology.wustl.edu/seminars/evpop.html

Bioforum, alternating Fridays, 4:00pm, McDonnell 361, check the website for topics/schedule:  http://www.biology.wustl.edu/seminars/biologyforum.html

Plant Lunches: most Tuesdays at noon (1st Tuesday of month @ DDSPC, others @ McDonnell 212)
Contact Professors Tuan-hua David Ho or Mark Running for topics/schedule.

Donald Danforth Plant Science Center (DDSPC), Weekly Seminar Series—Wednesdays, 3:45pm, AT&T Auditorium, check the website for topics:  http://www.danforthcenter.org/opportunities/seminars.asp

Division of Biology and Biomedical Sciences (DBBS), all lectures and seminars:  http://dbbs.wustl.edu/dbbs/website.nsf/SDN


October 2010

15th  Fall Break, Friday, October 15th—NO CLASSES

22nd  Parent and Family Weekend, Friday, October 22nd-24th

November 2010

3rd  The Thomas S. Hall Lecture “Alfred Wegener (1880-1930) and the Theory of Continental Drift: The Origins of Modern Earth Science”—Dr. Mott T. Greene, John Magee professor of Science and Values, University of Puget Sound, Tacoma, WA. McMillan Hall Rm 149, 4:00pm

16th  Spring 2011 Online Registration—Undergraduates 90+ Units

17th  Spring 2011 Online Registration—Undergraduates 57+ Units

18th  Spring 2011 Online Registration—Undergraduates 24+ Units

19th  Spring 2011 Online Registration—Undergraduates <24 Units

24th  Thanksgiving Break, Wednesday, November 24th-28th—NO CLASSES