Faculty Spotlight: Joseph Jez, Biology Chair

When asked how the department has changed in the last ten years, he stated that it has grown in the number of faculty, research labs, courses and students. Science itself has changed dramatically in the last decade. Though researchers are still working on the same questions that interest them, the types of science and scope have changed. Ten years ago “big data” was still an idea, but now we are actually doing it with genome sequencing, computational biology and other technology-driven scientific methods, for example the recently constructed Hengen Lab, which uses a network that has the capacity to collect and move data over 40 times faster than in traditional lab setups.

Science and the methods used to practice science have changed in ways that we didn’t completely predict. Exponential growth in technology allows us to take things further and technology is opening up in different directions. However, it may take some time for everyone to adopt these new methods and adapt the technology to address the questions they are trying to answer in their labs. Assembling a massive amount of information is the hard part, i.e. how do we tackle a collection of that size and use it to answer the questions we have and how do we determine what the next set of questions will be?

—cont’d on page 2
Joe Jez cont’d—Science is also becoming more cross-disciplinary. Boundaries between the study of biology, anthropology, physics, chemistry, psychology and other disciplines are breaking down and collaborations continue to become more important. Dr. Jez hopes to find ways to encourage Biology faculty to connect and collaborate across other departments within the university as well as partnering institutions.

Dr. Jez is a biology major advisor, Bio 200/500 mentor, and teaches undergraduate courses in biology (see course spotlight for details about the courses he teaches). When asked about goals for the department regarding biology students, Dr. Jez explained that in the past, Wash U focused more on recruiting students with the highest scores, but the university is beginning to look at things a little differently by trying to find ways to nurture students that have the same potential as those who score high on standardized tests, but don’t perform as well in traditional areas or in traditional ways. In particular, Arts & Sciences is looking at the STEM curriculum for introductory level courses to identify areas where students need help to reach their full potential and coming up with different methods of reaching these students. In conjunction with finding innovative methods of teaching, the Biology Department is looking at ways to create more flexibility in how the major is accomplished, instead of having one path to a bio degree. Another goal of Dr. Jez is to create more teaching lab space in the future, as well as updating current spaces. For more information about Joe Jez and his research, visit: http://pages.wustl.edu/jezlab.

Course Spotlight: The Biotech Explorers Pathway (BEP)

Joe Jez is now teaching a three course sequence for undergrads, including Bio 2010 AMPERSAND: The Science of Biotechnology, Bio 2020 Biotechnology Entrepreneurs Seminar, and Bio 3010 Biotechnology Project (writing intensive).

Bio 2010: AMPERSAND: The Science of Biotechnology is a first-year program course, co-taught by Dr. Joshua Blodgett, which showcases how different pieces of STEM come together. It is a gateway for students interested in the two-year Biotech Explorers Program (BEP). In traditional college settings, STEM topics are taught separately at the beginning of a student’s education and come together later in upper level courses. This set of courses offers students an opportunity for real world examples of how all of the components of the sciences they learn (Biology, Chemistry, Mathematics, Computer Science, Engineering, Law and more) come together in real life. The course uses local companies as examples of collaborative projects incorporating environmental, agricultural, diagnostic disciplines and more. See this page for more info: http://wubio.wustl.edu/courses/wucrsl/L41/2010/FL2018.

Bio 2020: Biotechnology Entrepreneurs Seminar, also designed as a first-year program course, covers the business side of science, featuring startup companies and addressing the issues involved in taking an idea to the level of a company. The course brings in guest speakers from local companies to discuss patenting, career paths, and more. See this page for more info: http://wubio.wustl.edu/courses/wucrsl/L41/2020/SP2018.

Bio 3010: Biotechnology Project (writing intensive), designed as a sophomore level course, has students pitching project ideas, introducing them to the process used to generate project ideas, write proposals, and evaluate concepts, with peer evaluation applied at all steps of the process. The class selects 3 or 4 of the projects presented and develops a
The Department of Biology sat down with Daniel Berkovich, Washington University sophomore and recipient of an American Society of Plant Biologists Summer Undergraduate Research Fellowship, to reflect on the ten weeks he spent working in the Jez lab this summer.

Tell us about yourself: I grew up in Chesterfield—a suburb of St. Louis—and I just stated my sophomore year at Washington University. I have not officially declared a major yet, but I am fairly certain that I will be pursuing a degree in Molecular Biology & Biochemistry. I have been considering this discipline since high school, and my interests have only been reaffirmed over the course of this summer.

You received the American Society of Plant Biologists Summer Undergraduate Research Fellowship. What was your motivation for applying for this fellowship, and why did you choose to work in the Jez lab? I actually started working in Joe’s lab three years ago, during the summer after my junior year of high school. I had been selected to be part of a program called STARS (Students and Teachers As Research Scientists), in which local students are paired with research professors in the St. Louis area. After the program ended, Joe graciously invited me to return to his lab the following summer, and I further continued my research in the Jez Lab as a first-year student at WashU. I learned about the ASPB fellowship my second semester, and I applied because it provided the opportunity to further develop my independent research skills, strengthen the concepts learned in introductory science classes at WashU, and network with like-minded peers and experts in the field.

What project did you work on this summer? My summer’s project revolves around a class of enzymes called aspartate aminotransferases (AATs) from the plant Arabidopsis thaliana (thale cress). These enzymes transfer the amine group from their amino acid substrate, aspartate, onto their keto acid substrate, α-ketoglutarate. Thus, AATs are vitally important for both amino acid metabolism and nitrogen assimilation. Despite their significance, these enzymes have not yet been fully characterized in plants. In other words, their structure, function, and regulation are not well understood. My project attempts to investigate the operation of plant AATs using various biochemical methods, in order to gain a deeper understanding of this important class of enzymes.

What did your time in the lab this summer teach you about what it means to do research as a career? I learned that conducting scientific research is rarely a straightforward process. Because my project aims to discover that which is yet unknown, there is little to guide my experimentation. There’s no manual. No instruction guide. So when experiments inevitably fail, it is up to the researcher to adapt to the situation. So while a career in research may have its challenges, it also encourages constant self-improvement and learning. Although this process might be frustrating at first, it becomes very rewarding when these adjustments eventually lead to success. —cont’d on page 4
What did you find most challenging about your research experience? As a type A person, I often find myself getting lost in the minutiae of developing experiments and conducting research. Whereas attention to detail can be a strength, I have noticed that it can also prevent me from focusing on the bigger picture. However, I am optimistic that my experience this summer has taught me how to better balance the particular and the comprehensive.

What did you find more rewarding about your research experience? The most rewarding aspect about research is the element of discovery. Piles of textbooks and months of college lectures can make it feel like everything to be known about biology has already been established. Because I am working in uncharted territory, all acquired data reveals completely novel information—information that I am the first to discover. In this way, I am motivated to conduct my research not only because I find it personally interesting, but because it grants me the privilege to contribute to the greater scientific community.

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@wustl.edu

Undergraduate Research Symposium 10/27/18

Twice yearly the Office of Undergraduate Research sponsors the Undergraduate Research Symposium. It is a forum for students to present their research findings and a celebration of the diversity of research that takes place at Wash U. We encourage students in all academic departments, programs and schools to present their original research. The event has included a keynote address, selected student talks, a poster session, and performances and demonstrations of projects. The Fall 2018 Undergraduate Research Symposium will be held on Saturday, October 27 from 12:00-3:30pm.

For students who are interested in getting started in research, the Symposium is a great opportunity to learn about the process from your peers. Meet researchers in your area of interest to find out about resources and opportunities. Everyone is welcome to attend the symposiums!

Course Spotlight cont’d—plan for them. Joe recruits a faculty advising board, experts in areas of science. For the final, students present the plans to a panel of experts who pick a winner. See this page for more info: http://wubio.wustl.edu/courses/wucrsl/L41/3010/FL2018.

Through all three courses, active learning is emphasized with minimal lecturing. Students are encouraged to develop their own ideas. This method helps foster an independent mindset by the third course, guiding them through the process. Seeing the amazing growth of a student from the first semester of undergrad to working side by side with experts in the field at a high level in just a year and a half is tremendously rewarding for Dr. Jez.

Tyson Undergrad Research Info Session on 11/5/18

Tyson provides many opportunities for undergraduate students from WashU and other institutions to participate in research through the 11-week Tyson Undergraduate Fellows Program. The number of fellowships offered each summer depends on the current research needs of project principal investigators. Students meet at Rebstock Hall on the Danforth Campus daily and carpool out to the field station. They collect data for faculty-driven projects and often carry out their own smaller independent projects, some of which even make it into peer-reviewed scientific journals. On Thursday afternoons the fellows attend colloquium, which takes place right before the weekly Tyson summer seminar by a visiting scientist. https://tyson.wustl.edu/undergraduate-opportunities/

Learn more at the Tyson Undergrad Research Info Session on Monday, November 5th from 5:00-7:00pm in Mallinckrodt 302. Pizza will be provided!
Biology Department Calendar

Links to General Calendars and Regular Events:

Washington University Record Calendar: https://news.wustl.edu/Pages/Calendar.aspx

Biology Department Seminars, Mondays, 4:00pm, Rebstock 322, check the website for topics/schedule: http://wubio.wustl.edu/events

Evolution, Ecology, & Population Biology Seminars, Thursdays, 4:00pm, Rebstock 322, check the website for topics/schedule: http://wubio.wustl.edu/events?field_event_tags_tid=18

History & Philosophy of Science Seminar Series: http://pages.wustl.edu/hpbm/events

Plant and Microbial Biosciences Brunch, most Fridays at 9:00am, Rebstock 322: http://wubio.wustl.edu/events?field_event_tags_tid=21

Donald Danforth Plant Science Center (DDPSC), Weekly Seminar Series—most Wednesdays, 3:45pm, AT&T Auditorium, check the website for topics: http://www.danforthcenter.org/the_center/events/seminars_symposia/

Division of Biology and Biomedical Sciences (DBBS), all lectures and seminars: http://dbbs.wustl.edu/Pages/Events.aspx

October 2018

15th FALL BREAK OCT 15-17—NO CLASSES

26th Parent and Family Weekend: October 26-28

27th Undergraduate Research Symposium: undergrads will present the results of their research from 12:00–3:30pm; https://undergradresearch.wustl.edu/symposium

29th Advising Period Begins, October 29th-November 9th

November 2018

5th Tyson Undergrad Research Info Session; 5-7pm, Mallinckrodt 302, FREE PIZZA; https://tyson.wustl.edu/undergraduate-opportunities/

9th Spring 2019 online registration: undergraduates graduation class of 2019

12th Spring 2019 online registration: undergraduates graduation class of 2020

13th Spring 2019 online registration: undergraduates graduation class of 2021

15th Spring 2019 online registration: undergraduates graduation class of 2022

21st Thanksgiving Break, Wednesday, November 21st-25th—NO CLASSES