Discovering Human Physiology

When I arrived at the University of Oregon as a freshman in 2012, I was a biochemistry major with medical school in my sights. During the week of orientation, I met freshman with similar professional goals—doctor, nurse, physical therapist—who were human physiology (HPHY) majors. I researched the HPHY program just enough to know I liked it more than biochemistry, and I somewhat hastily switched majors before classes even started. Fortunately, I had stumbled on an exceptional and burgeoning academic program that perfectly suited my academic interests and offered excellent preparation for my career goals.

The HPHY major is, first and foremost, a rigorous academic challenge. As majors, we must successfully complete full-year sequences of chemistry, biology, and physics to gain the foundational knowledge for our core classes of anatomy, physiology, and exercise physiology. The typical student spends 2 years grinding through these prerequisites and other general education courses. Successfully navigating these classes requires serious dedication and hard work, and the promise of our major’s core offerings serves as motivation when magnetism fails to attract our interest and plant biology makes us wilt.

The professors for our major’s core classes combine mastery of the material with a passion for innovative education, and the result is a truly exceptional academic environment. As students, we arrive to every class knowing that it will be infused with humor, stretch breaks when necessary, and engaging activities to shrink our 300-person lecture hall down to a seminar style environment. These activities include small group sessions to represent concepts on jumbo-sized post-its pinned to the lecture hall walls, call and response style review of muscle actions, and frequent questions to discuss with our neighbors. This teaching style would not be possible with just one professor; the “teaching team” is bolstered by graduate students and undergraduate teaching assistants who mingle with students to encourage discussion and provide quick answers to questions. The teaching team members also hold weekly office hours, and more than 25 hours of extra, individualized help are offered weekly for anatomy and physiology. The HPHY department’s commitment to outstanding teaching sets it apart within the University of Oregon, and our professors have repeatedly been recognized with teaching awards.

Our core classes are incredibly demanding, requiring several hours of preparation before each lecture and concurrent participation in lab. Before every daily class session, we grapple with the next day’s material and add to our growing “External Brain” (EB). The EB is an individually developed resource that covers most course topics. Each student’s EB is different; some choose to rely primarily on prose, whereas others incorporate more illustrations and flow charts to facilitate their understanding. Regardless of an EB’s form, its creator arrives to class prepared to dive deeper into the material and ask clarifying and probing questions.

Through all the HPHY core classes, our lab experiences contextualize and reinforce our knowledge. We use surface electromyography, sphygmomanometers, force transducers, and other basic techniques to observe normal and perturbed physiology. The lab component of our anatomy courses grants us the rare privilege to work with cadavers as undergraduates. Our cadaver lab has eight dissected cadavers that provide us the invaluable opportunity to experience human anatomy first hand. Our anatomy professor refers to the eight cadavers as our “first patients,” and we develop profound respect and appreciation for the individuals who make the experience possible. Lab exams pose the formidable challenge of correctly identifying, siding, and spelling tagged structures selected from the hundreds covered in our courses.

The cadaver lab experience would not be possible without another unique opportunity offered to HPHY undergraduates: dissection. Our program receives new cadavers each spring, and students in the dissection course have the privilege of preparing the cadavers for the upcoming year of anatomy. This unique experience challenges students to master the anatomy of a region and confront the emotional reality of dissecting a human body. Of all the opportunities available in the HPHY department, dissection is truly a rare experience for undergraduates nationwide. Staff at several medical schools in Virginia estimated that between 5% and 10% of incoming medical students have prior human dissection experience (1).

While the anatomy and physiology sequence is the core of the HPHY curriculum, upper division classes expand and refine our knowledge. I earned my upper division credits with four courses—dissection, motor control, tissue injury and repair, and neurophysiology of concussion—and several terms as an undergraduate teaching assistant for the physiology sequence. These upper division credits serve as a natural reinforcement for the foundational anatomy and physiology concepts learned previously, and the variety of courses available offers us the opportunity to delve into topics that we are passionate about. I graduated this past June, but I would not have objected to another undergraduate year filled entirely with upper division courses like muscle metabolism, pathophysiology, physiology of obesity, clinical ECG/EKG, and high-altitude physiology and medicine.

The undergraduate experience in the HPHY department is rarely confined to the classroom. The department facilitates internships and volunteer opportunities at area clinics and hospitals, and students are encouraged to pursue their own shadowing and professional experiences as well. I was fortunate to work as a research assistant in our Exercise and Environmental Physiology Lab, 1 of 12 HPHY labs on campus that offer positions for undergraduates. Undergraduate responsibilities within the lab range from data collection and entry to equipment operation and blood sample processing. I have recently been closely involved in the development of a new research protocol, part of which is addressed in my undergraduate thesis. Undergraduate research...
assistants benefit from the mentorship of the lab’s primary investigator and graduate students, and our research experiences are valuable for graduate school decisions and applications. My experiences in the lab have led me to reconsider my graduate school plans and give serious consideration to remaining in research.

I arrived to the University of Oregon with no knowledge of the HPHY program, but I leave with the sincere belief that I received the best education available in our field. The HPHY program is exceptionally well designed and implemented, and undergraduates receive opportunities and challenges that most do not encounter until graduate school. The research labs in the HPHY program do outstanding work, but the department and individual faculty remain committed to teaching first and research second. When I walked across the stage to receive my HPHY diploma, I felt an immense measure of pride and appreciation. I am proud of my individual achievements, but I take more pride in being a part of the exceptional and blossoming HPHY department, and I am incredibly appreciative of the individuals who work tirelessly to make our department world class.

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