BIOLOGICAL SCIENCES
COLLEGIATE DIVISION

MAJORS

Biological Sciences

In hands-on biological sciences laboratory sessions, students gain an understanding of the experimental support for concepts presented in the classroom.

Sample Courses

The 3.5 Billion Year History of the Human Body

Students explore each major organ and system of the body from the perspectives of anatomy, paleontology, and developmental genetics to understand the deep history of the body and our connections to the rest of life on the planet.

Conquest of Pain

This course examines the biology of pain and the mechanisms by which anesthetics alter the perception of pain. Students explore the anatomy of pain pathways and the underlying explanations for the action of general and local anesthetics.

Bioarcheology and the Human Skeleton

Students develop a thorough understanding of bioanthropological and osteological methods used in the interpretation of prehistoric societies. Hands-on lab experience in analyzing the human skeleton complements seminars that integrate theory and application to specific cases throughout the world.

Dinosaur Science

This intensive introductory level course provides students with the knowledge needed to discover and understand the meaning of fossils as they are preserved in the field. Participants camp, prospect for, and excavate fossils on a ten-day expedition in South Dakota and Wyoming.

Medical Ethics: Who Decides and on What Basis?

Changing health care systems, evolving ideas about rights and obligations, and doctors and patients of diverse religious and cultural backgrounds influence decisions about medical treatment. Students examine paternalism, autonomy, and the commodification of the human body.

"I knew that at the University of Chicago I would be exposed to a diversity of subjects and some of the best faculty who emphasize integrating all these studies."
Kelly Regan
BA'11
Major: Biological sciences

The University of Chicago's biological sciences major provides essential knowledge for understanding many of the most pressing biological problems of modern life and for contributing to their solutions. Students benefit from a student-to-faculty ratio of seven to one and the proximity of the Pritzker School of Medicine, the University of Chicago Medical Center, and the graduate Division of the Biological Sciences, all of which provide ample resources for undergraduate educational advancement and research.

Curriculum

As required for the major, students complete a five-quarter introductory course sequence in biology, a course in biochemistry, and introductory sequences in general chemistry, organic chemistry, calculus, and physics. With a wide number of courses to choose from and numerous paths by which a student can complete the major, the biological sciences major is especially accommodating to students of different backgrounds and interests. Specialized major programs include cellular and molecular biology, ecology and evolution, endocrinology, genetics, immunology, microbiology, and neuroscience. The University's integrated approach links biology with medical fields and the physical sciences as well as such fields as philosophy, anthropology, gender theory, and public policy. Students may also minor in biological sciences or computational neuroscience.

Resources and Research Opportunities

Students actively pursue their academic and career interests outside of the classroom. Many enroll in the Chicago Careers in Health Professions (CCIHP) program, which offers many services, including an additional full-time adviser; internships in research, clinical studies, and policy; faculty-student mentorships; and a customized, on-campus MCAT preparation course.

Undergraduates may also participate in research alongside UChicago's world-renowned faculty in their laboratories or within the University of Chicago Medical Center. Research opportunities are available to all students, regardless of their year in the College. Many undergraduates coauthor an impressive number of papers in renowned scientific and medical journals.

Many students conduct their own research through internships and fellowships, and honors students complete an individual research program. Examples of recent honors projects include:

- "Coloration Indicates Body Size in the Dark-Winged Damselfly, *Calopteryx Maculata* (Odonata: Insecta)"
- "A Potential Role for Nociceptive-Modulatory Neurons in the Raphe Magnus in Intradermal Serotonin-Induced Hyperalgesia"
- "RKIP Signaling Pathway Signature in Breast Cancer Metastasis to the Lungs"
- "A Birdsong Model of Epilepsy"

Student-Faculty Partnerships

The following is just a small sampling of research that University of Chicago faculty pursue with the help of both undergraduate and graduate students:

- **Matthew Brady** (endocrinology). Brady is interested in the subcellular organization of glycogen metabolizing enzymes, as well as regulation of energy metabolism by insulin and glucocorticoids in primary mouse and human adipocytes.
- **Bana Jabri** (immunology). Jabri uses a range of molecular and cellular approaches to study the developmental and functional aspects of immune function in the mouse and human intestine.
- **Richard Fehon** (molecular genetics and cell biology). Fehon's interests center on the molecular mechanisms by which signal transduction pathways are organized into specialized membrane domains.
- **Nicholas Hatsopoulos** (neuroscience). Hatsopoulos's research focuses on how neuronal ensembles in the cortex act together to control, coordinate, and learn complex movements of the arm and hand.
- **Dominique Missiakas** (microbiology). Missiakas's research program examines various protein secretion pathways of *Staphylococcus aureus* and *Bacillus anthracis* and their contribution to virulence.
- **Catherine Pfister** (ecology and evolution). Pfister's research in ecology focuses on population- and community-level phenomena in marine systems, particularly the consequences of marine population fluctuations for persistence and the interactions between species and ocean nutrients.

Facilities

The University's main biology facility, the Dorothy and Gaylord Donnelley Biological Sciences Learning Center, combines medical research with a learning center for biology students from the undergraduate to postdoctoral level. In addition to classrooms and seminar rooms, the Learning Center contains interactive teaching labs using state-of-the-art equipment as well as a rooftop greenhouse facility.

Additional on-campus facilities devoted to biological sciences include:

- The Institute for Molecular Medicine, the Surgery-Brain Research Pavilion, the Cummings Life Science Center, the Marjorie B. Kovler Viral Oncology Laboratories, and the numerous laboratories and clinics of the University of Chicago Medical Center
- The Gwen and Jules Knapp Center for Biomedical Discovery, a new addition to campus that provides over 330,000 square feet of research space for groundbreaking initiatives in the biological sciences
- The Gordon Center for Integrative Science, which houses the Howard Hughes Medical Institute, the Ben May Department for Cancer Research, and the Institute for Biophysical Dynamics
- The John Crerar Library, one of the largest private collections in the country specifically devoted to the natural sciences
- The William Eckhardt Research Center, which will host a broad spectrum of 21st-century science, from investigation of the deepest cosmic mysteries to manipulations of matter on the scale of atoms and molecules, and house the new Institute for Molecular Engineering. Construction began in fall 2011.

Extracurricular Activities

Phoenix, UChicago's undergraduate biology club, organizes academic and social events and centralizes the numerous resources available to biology students, including job announcements, information on upcoming research projects, and course evaluations. The Pre-Medical Students Association (PMSA) helps students develop and explore their interest in medicine. The group administers practice MCAT exams and offers mentoring programs that pair undergraduates with medical students.

Additional organizations of interest to biological sciences majors include the Student National Medical Association, the Synthetic Biology club, the Undergraduate Molecular Biosciences Journal club, the Complementary and Alternative Medicine Interest Group, and the Multicultural Community for Academic Advancement in Medicine.

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