Anatomy and Cell Biology

Chair
• John F. Engelhardt

Professional degree: M.C.A.
Faculty: https://medicine.uiowa.edu/acb/people/primary-appointments
Website: https://medicine.uiowa.edu/acb/

The Department of Anatomy and Cell Biology performs three major functions. It teaches human anatomy to students preparing for careers in the health care professions; provides advanced courses, teaching experience, and research training to graduate students preparing for careers in academic research and related scientific fields; and conducts original research on the biological basis of cellular functions and human disease processes.

Preclinical Study
The department contributes to the preclinical education of health care professionals by providing major courses in gross anatomy, cell biology, histology, and neuroscience.

Graduate Study
The department offers the cell and developmental biology subprogram for the Ph.D. in biomedical science. It also participates in the Carver College of Medicine’s Medical Scientist Training Program and the Graduate College’s Molecular Medicine, Immunology, Genetics, and Neuroscience Programs. On occasion, students are directly admitted to a Department of Anatomy and Cell Biology laboratory by arrangement with the laboratory director.

Professional Study
The Department of Anatomy and Cell Biology offers a professional degree, the Master of Clinical Anatomy (M.C.A.).

Programs

Graduate Programs of Study

Majors
• Master of Science in Anatomy and Cell Biology
• Doctor of Philosophy in Anatomy and Cell Biology

Students interested in doctoral studies in cell and developmental biology should apply under the umbrella program in Biomedical Science (select cell and developmental biology subprogram). Direct applications to the M.S. and Ph.D. in anatomy and cell biology are not currently being considered.

Professional Program of Study

Major
• Master of Clinical Anatomy

Facilities

The department occupies more than 35,000 square feet in the Bowen Science Building on the University of Iowa health sciences campus. The building houses modern teaching facilities and well-equipped research laboratories. The most modern instrumentation is available, including facilities and equipment for digital microscopic imaging, confocal microscopy, molecular biological techniques, tissue culture, and protein chemistry. Other specialized equipment (e.g., electron microscopes, mass spectrophotometers) is available in other facilities. Through collaborative programs with the Holden Comprehensive Cancer Center and the Abboud Cardiovascular Research Center, faculty and students also have access to outstanding research facilities throughout the University’s health sciences campus.

Courses

Anatomy and Cell Biology Courses

ACB:3110 Principles of Human Anatomy 3 s.h.
Gross and microscopic human anatomy; systemic approach to regional anatomy with emphasis on clinical relevance; optional tutorial sessions. Offered fall semesters. Requirements: pharmacy, pre-nursing, or associated medical sciences major.

ACB:3122 Independent Study in Anatomy and Cell Biology arr.
Projects arranged with department faculty members.

Microscopy methods for research; all aspects of research, from sample preparation to imaging to data analysis; when to use a particular microscopy procedure; theory, operation, and application of scanning electron microscopy, scanning probe microscopy, laser scanning microscopy, X-ray microanalysis. Requirements: a physical science course. Same as CBE:4156, EES:4156.

ACB:5108 Human Anatomy 5 s.h.
Regional dissection, lectures, demonstrations; areas important to physical therapists, particularly the upper and lower extremities. Offered fall semesters. Requirements: physical therapy and rehabilitation science enrollment.

ACB:5203 Gross Human Anatomy for Graduate Students 5 s.h.
Regional dissection, lectures, demonstrations, tutorials, discussions, seminars; clinically relevant areas of anatomical radiology, surface anatomy with clinical correlations. Requirements: enrollment in master of clinical anatomy program.

ACB:5206 Graduate Research in Cell and Developmental Biology arr.
Individual laboratory research training in anatomical sciences.

ACB:5210 General Histology Online 3 s.h.
Histology of all tissues of human body starting with basic tissues and working through systems of the body; linked in sequence to the human gross anatomy for graduate students course so students will be learning about related content at the same time in anatomy and histology; online course consisting of recorded lectures, online modules, and extensive use of Virtual Microscope. Requirements: enrollment in master of clinical anatomy program.
ACB:6238 Critical Thinking in Genetics 1 s.h.
Current topics in molecular and classical genetics; emphasis on genetic underpinnings of disease; based on primary research publications.

ACB:6239 Critical Thinking in Cell Biology 1 s.h.
Understanding subcellular organization and intercellular communication; emphasis on critical thinking and primary research publications.

ACB:6248 Critical Thinking in Development 1 s.h.
Current topics in molecular basis of vertebrate development; based on primary research publications.

ACB:6249 Critical Thinking in Cellular Physiology 1 s.h.
Control of physiological systems at the cellular level; emphasis on regulation by molecular signaling pathways; literature-based.

ACB:6250 Critical Thinking in Scientific Writing and Presentations 1 s.h.
Scientific grant writing, particularly specific aims development, and oral presentations. Requirements: second-year standing in cell and developmental biology graduate program.

ACB:6252 Functional Neuroanatomy arr.
Basic principles of neuroanatomy and neurophysiology; emphasis on human central nervous system; laboratory emphasis on anatomical study of spinal cord and brain. Offered spring semesters. Requirements: physical therapy and rehabilitation science enrollment or graduate standing. Same as PTRS:6253.

ACB:6265 Neuroscience Seminar 0-1 s.h.

ACB:7001 Teaching and Learning in the Anatomical Sciences 2 s.h.
Strategies involved in anatomical sciences education; these include interactive lecturing, dissection, peer teaching/learning, plastination, virtual microscopy, simulation, and case presentation, as well as assessment techniques; online course delivered through recorded lectures and online modules. Requirements: enrollment in master of clinical anatomy program.

ACB:7002 Seminar in Anatomical Sciences 1 s.h.
Opportunity to discuss peer-reviewed anatomical, clinical, and education research articles as they relate to issues of teaching in the anatomical sciences; student- and/or faculty-led presentations prompt further discussion of various in-depth studies that focus on bringing current information into the classroom. Requirements: enrollment in master of clinical anatomy program.

ACB:7010 Anatomy Through Imaging 2 s.h.
Exploration of anatomy through basic imaging techniques; online modules and in-class activities; focus on identification of normal structures through application of anatomical concepts. Requirements: enrollment in master of clinical anatomy program.

ACB:7020 Human Embryology Online 2 s.h.
Major events of embryologic development in humans; more of a morphologic focus than a molecular focus, but includes important molecular concepts of development; students come to understand the backstory of adult human anatomy and how various birth defects occur. Offered spring semesters. Prerequisites: ACB:5203 or ACB:6101 or ACB:5108. Requirements: enrollment in master of clinical anatomy program.
ACB:7227 Anatomic Study for Teaching 2-3 s.h.
Experience completing a detailed dissection of a region of the human body; opportunity to create models depicting anatomical concepts. Requirements: enrollment in master of clinical anatomy program.

ACB:7400 Practicum in College Teaching for Master of Clinical Anatomy 1-4 s.h.
Supervised college teaching experience; teaching in collaboration with faculty, observation and critiques of teaching, participation in course planning and evaluation procedures; ethical and multicultural considerations. Recommendations: enrollment in master of clinical anatomy program.

ACB:8101 Medical Gross Human Anatomy 5 s.h.
Complete dissection of the body with regional emphasis stressing relationships to the living system; clinically relevant areas of radiologic imaging, surface anatomy, embryology, and clinical correlations; anatomical knowledge through lectures, small group work, independent activities. Offered fall semesters. Requirements: M.D. or M.P.A.S. enrollment.

ACB:8120 Human Gross Anatomy for Dental Students 6 s.h.
Exploration of gross anatomy of human body including thorax, abdomen, upper limb; extensive focus on head, neck, and neuroanatomy; regional and systemic approaches; course sequence and assessment blended with general histology for dental students; cadaveric dissections closely follow lecture sequence; emphasis on correlations to dental practice. Offered spring semesters. Requirements: D.D.S. enrollment.

ACB:8121 General Histology for Dental Students 4 s.h.
Microscopic study of cells, fundamental tissues, organ systems; emphasis on tooth-related structures. Offered spring semesters. Requirements: D.D.S. enrollment or anatomy and cell biology graduate standing.

ACB:8401 Advanced Human Anatomy arr.
Regional dissection of the body with emphasis on systems relevant to student's specialty interests; discussion, reading, clinically relevant imaging, embryology. Offered spring semesters. Requirements: fourth-year M.D. enrollment or graduate standing.

ACB:8402 Teaching Elective in Regional Anatomy 2,4 s.h.
Students expand knowledge and experience in medical education; investigation of educational pedagogy in a laboratory setting coupled with self-directed learning of anatomical content relevant to professional development; preparation, design, and implementation of four teaching interactions with M1/D1/PA1 students; designing a classroom exercise (e.g., interactive lecture, learning activity, computer-based study module) that helps bridge the basic science content with clinical procedure. Requirements: M.D. standing and enrollment in teaching distinction track.

ACB:8498 Special Study On Campus arr.
Anatomy research on campus; individually arranged. Requirements: M.D. enrollment.