

DEPARTMENT OF CELL BIOLOGY AND PHYSIOLOGY (GRAD)

Contact Information

Department of Cell Biology and Physiology

Visit Program Website (<http://www.med.unc.edu/cellbiophysio>)

Kathleen Caron, Chair

Admission to the graduate program curriculum is via the unified Biological and Biomedical Sciences Program (BBSP) at UNC–Chapel Hill. A bachelor's degree (B.A. or B.S.) is required for admission. Applicants are expected to have a strong background in the biological sciences, chemistry, physics, and mathematics. Details of the application process are available at the BBSP Web site (<http://bbbsp.unc.edu>) and The Graduate School's admissions Web site. (<http://gradschool.unc.edu/admissions>) Briefly, the application should include transcripts, Graduate Record Examination (GRE) scores, three letters of recommendation, and a personal statement outlining career goals.

The mission of the Curriculum in Cell Biology and Physiology is to provide students with a rigorous, individually tailored educational experience to prepare them for research and teaching careers in the biomedical sciences. This graduate program will provide a forum for graduate students to learn current concepts in modern cell biology and physiology and to develop the skills necessary to formulate sophisticated strategies for analysis of contemporary problems in cell biology and physiology. Based on a solid foundation of coursework in cell biology and physiology, students will further complement their training by selecting courses in bioinformatics/statistics, genetics, pharmacology, immunology, and/or biochemistry that best support and enhance their specific area of research interest. Dissertation research enables students to apply these tools to a problem of intellectual and biomedical interest. Students receive strong training in the scientific process and apply their skills to probe the mechanistic basis of biological problems at molecular, cellular, and systems levels. A strong emphasis will be placed on career development, such as oral and written presentation skills, and mentoring students in a way that enables them to explore the diverse job opportunities available to them in the post-graduate biomedical workforce. Graduates will be well prepared to continue their research careers in a number of academic disciplines.

Assistantships and Other Student Aid

Students are supported by a stipend of \$30,000 annually plus tuition, fees, and medical insurance.

The curriculum provides training for students whose research/teaching career objectives are faculty positions in medical school basic sciences departments. However, the flexibility of the program also provides for the training of students who seek careers in basic science as well as in clinical science departments of medical schools, in other professional schools such as dental schools, in liberal arts academic departments such as biology, or in state, federal, private, and industrial research laboratories. The program for the Ph.D. normally takes five to six years to complete. Persons interested in a combined M.D./Ph.D. program must be accepted into the School of Medicine and the departmental graduate

program, whereupon the combined studies are scheduled in accordance with individual requirements.

Ph.D. students take graduate-level courses in their first year as well as conduct laboratory rotations. Students who join the curriculum at the end of year one are examined for advancement to candidacy. Ph.D. candidacy is followed by a dissertation based on original research is conducted under the supervision of a faculty advisor. Additional information is available on the departmental Web site (<http://www.med.unc.edu/physiolo>).

Professors

Eva Anton
William Arendshorst
Albert Baldwin
Vicki Bautch
James Bear
Kerry Bloom
Jay Brenman
Patrick Brennwald
Keith W.T. Burridge
Kathleen Caron
Richard Cheney
Jean Cook
M. Joseph Costello
Frank Conlon
Douglas M. Cyr
Channing Der
Mohanish P. Deshmukh
James Faber
Bob Goldstein
Klaus Hahn
Kenneth A. Jacobson
Alan Jones
Tom Kash
Richard Loeser
Chris Mack
Paul Manis
Greg Matera
Carol Otey
Leslie Parise
Mark Peifer
Ben Philpot
Joan Taylor
Jenny Ting
Ellen R. Weiss
Richard Weinberg
Mark Zylka

Associate Professors

Wolfgang Bergmeier
Adrienne Cox
Timothy Gershon
Amy Gladfelter
Stephanie Gupton
Scott Hammond
William Kim
Scott Magness
Ben Major
Larry Ostrowski
Scott Randell

Stephen Rogers
Garret Stuber
Robert Tarran

Assistant Professors

Antonio Amelio
Edward Bahnson
Michael Bressan
Sarah Cohen
Graham Diering
Mike Emanuele
Flavio Frohlich
Kurt Gilliland
Jimena Giudice
Jiandong Liu
Damaris Lorenzo
Amy Maddox
Shaun McCullough
Zoe McElligott
Saskia Neher
Lori O'Brien
Douglas Phanstiel
Yuliya Pylayeva-Gupta
Li Qian
Spencer Smith
Natasha Snider
Juan Song
Scott Williams

Professors Emeriti

Robert G. Faust
Paul B. Farel
Noelle A. Granger
Charles R. Hackenbrock
O'Dell W. Henson Jr.
Enid R. Kafer
William E. Koch
Jean M. Lauder
Alan Light
David L. McIlwain
Edward R. Perl
Peter Petrusz
Lloyd R. Yonce

CBIO

CBIO 400. Introduction to Medical Simulation. 3 Credits.

This entry-level medical simulation course focuses on understanding the integration of simulation technology into clinical education, patient safety, and research applications to include the teamwork and communication skills related to these applications.

Grading status: Letter grade.

CBIO 423. Developmental Toxicology and Teratology. 3 Credits.

Emphasizes topics of current research interest relative to the genesis of environmentally caused and genetically based birth defects. One two-hour session per week (evening).

Grading status: Letter grade

Same as: TOXC 423.

CBIO 607. Gross Anatomy. 2-4 Credits.

Permission of the instructor. Primarily for graduate students. Enrollment by availability of space and material.

Grading status: Letter grade.

CBIO 627. Regional Anatomy. 3 Credits.

Permission of the instructor. For students of oral surgery, surgical residents, and graduate students.

Grading status: Letter grade.

CBIO 643. Cell Structure, Function, and Growth Control I. 3 Credits.

Comprehensive introduction to cell structure, function, and transformation.

Requisites: Prerequisite, undergraduate cell biology or biochemistry or permission of the instructor.

Grading status: Letter grade

Same as: BIOC 643, PHCO 643, PHYI 643.

CBPH

CBPH 705. Communicating Scientific Results. 1 Credit.

Practice in oral and written communication evaluated by peers and faculty. Includes delivery of coached presentations on topics in physiology and preparation of writing assignments typically encountered in scientific life.

Repeat rules: May be repeated for credit.

Grading status: Letter grade.

CBPH 706. Communicating Scientific Results. 1 Credit.

Practice in oral and written communication evaluated by peers and faculty. Includes delivery of coached presentations on topics in physiology and preparation of writing assignments typically encountered in scientific life.

Repeat rules: May be repeated for credit.

Grading status: Letter grade.

CBPH 741. Introduction to Human Anatomy. 3 Credits.

A general course for persons preparing for careers as dental hygienists. Two lectures and two laboratory hours a week.

Grading status: Letter grade.

CBPH 791. Gross Anatomy for Physical Therapists. 4 Credits.

Fundamental principles and concepts of human gross anatomy for physical therapists taught by lectures and cadaver dissection. Emphasis on functional anatomy. Three lecture hours and six laboratory hours a week.

Requisites: Prerequisites, BIOL 474 and 474L; Permission of the instructor for students lacking the prerequisites.

Grading status: Letter grade.

CBPH 793. Functional Neuroanatomy. 3 Credits.

Study of basic structure of the brain and spinal cord, including both lecture and laboratory. Primarily for physical therapy students. Four hours a week.

Requisites: Prerequisites, CBIO 607 and CBPH 791; permission of the instructor for students lacking the prerequisites.

Grading status: Letter grade.

CBPH 800. Seminar in Cell Biology & Physiology. 1-3 Credits.

Current topics relevant for biomedical sciences students. May be repeated for credit. May be repeated in the same term for different topics.

Repeat rules: May be repeated for credit.

Grading status: Letter grade.

CBPH 850. Modern Concepts in Cell Biology I. 4 Credits.

Permission of the instructor. Graduate students only. Discussion based course that covers key elements of cell, molecular, and developmental biology, and genetics. Students present and discuss breakthrough primary research papers under the direction of faculty members across the department. Minimal instructor lecturing is included.

Grading status: Letter grade.

CBPH 851. Modern Concepts in Cell Biology II. 4 Credits.

Literature based discussion course on experimental approaches in Cell Biology. Emphasis is on small group discussion and dissection of primary literature including methods, scientific logic, and critical thinking. Each session typically includes both a discussion of key background by a faculty member and student led discussions of selected papers from the primary literature.

Grading status: Letter grade.

CBPH 852. Experimental Physiology of Human Health and Disease. 4.5 Credits.

Students will learn the principles of cell, organ, and systems physiology and pathophysiology required to identify and understand important areas of current biomedical research. This course will focus on non-human model systems (cultured cells, mice, drosophila, etc.). In addition to lectures, this course will include journal-club discussion of assigned papers.

Grading status: Letter grade.

CBPH 853. Experimental Physiology of Human Health and Disease. 4.5 Credits.

Permission of the instructor. Molecular and cellular basis of organ system function; integration of systems to maintain the normal state. Understanding of normal physiology is amplified by examples from human disease and mouse models. Principles of cell, organ, and integrative physiology and how these principles apply to translational research.

Grading status: Letter grade.

CBPH 855. Career and Research Enhancement Seminar (CaRES). 1-2.5 Credits.

Permission of the director of graduate studies.

Grading status: Letter grade.

CBPH 856. Career and Research Enhancement Seminar (CaRES). 1-2.5 Credits.

Permission of the director of graduate studies.

Grading status: Letter grade.

CBPH 890. Special Topics in Cell Biology & Physiology. 1-5 Credits.

Modern day exploration of topics or methodologies of interest to PhD students in biomedical sciences. New or old relevant technologies/methodologies or subject areas of research, and/or professional skills enhancement will be addressed. This could be either for enhancing knowledge of subject materials or teaching skill sets (e.g., statistics) needed for biomedical researchers.

Repeat rules: May be repeated for credit; may be repeated in the same term for different topics; 5 total credits. 5 total completions.

Grading status: Letter grade.

CBPH 895. Responsible Conduct of Research (RCR). 1 Credit.

Responsible conduct of research is a classroom-based graduate level course covering critical topics for ethical and responsible conduct of experimental research. There are both classroom lecture, workshop-type discussion components, in addition to assigned outside of class readings. Topics include: mentor and mentee relationships, publication authorship, collaboration, peer review, ethical use of human and animal subjects, conflicts of interest, intellectual property, plagiarism, data acquisition, and data processing.

Grading status: Letter grade.

CBPH 910. Research. 2-15 Credits.

Credit to be arranged in individual cases.

Grading status: Letter grade.

CBPH 915. Research Laboratory Apprenticeship. 2 Credits.

Enrollment in the cell biology and anatomy graduate program required.

A course for first- and second-year graduate students in cell biology and anatomy, consisting of a research project of limited scope pursued under the supervision of a faculty member.

Repeat rules: May be repeated for credit.

Grading status: Letter grade.

CBPH 993. Master's Research and Thesis. 3 Credits.**CBPH 994. Doctoral Research and Dissertation. 3 Credits.**

PHYI

PHYI 643. Cell Structure, Function, and Growth Control I. 3 Credits.

Comprehensive introduction to cell structure, function, and transformation.

Requisites: Prerequisite, undergraduate cell biology or biochemistry or permission of the instructor.

Grading status: Letter grade

Same as: CBIO 643, BIOC 643, PHCO 643.