DEPARTMENT OF CELL BIOLOGY AND PHYSIOLOGY (GRAD)

Contact Information
Department of Cell Biology and Physiology
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://bbsp.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/physiol).

Professors
Eva Anton
William Arendshorst
Albert Baldwin
Vicki Bautch
James Bear
Kerry Bloom
Jay Brennan
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
Liza Makowski
Larry Ostrowski
Department of Cell Biology and Physiology (GRAD)

Scott Randell  
Stephen Rogers  
Garret Stuber  
Robert Tarran

Assistant Professors
Edward Bahnson  
Michael Bressan  
Flavio Frohlich  
Kurt Gilliland  
Jimena Giudice  
Jiandong Liu  
Damaris Lorenzo  
Amy Maddox  
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. McLwain  
Edward R. Perl  
Peter Petrusz  
Lloyd R. Yonce

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.

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.

CBPH 711. 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.

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.

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.

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.

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.
CBPH 852. Experimental Physiology of Human Health and Disease. 4 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.

CBPH 853. Experimental Physiology of Human Health and Disease. 4 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.

CBPH 855. Career and Research Enhancement Seminar (CaRES). 1 Credit.
Permission of the director of graduate studies.

CBPH 856. Career and Research Enhancement Seminar (CaRES). 1 Credit.
Permission of the director of graduate studies.

CBPH 910. Research. 2-15 Credits.
Credit to be arranged in individual cases.

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.

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.