DEPARTMENT OF CELL BIOLOGY AND PHYSIOLOGY (GRAD)

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 website (http://bbsp.unc.edu/) and The Graduate School's admissions website. (http://gradschool.unc.edu/admissions/) Briefly, the application should include transcripts, three letters of recommendation, and a personal statement outlining career goals.

The mission of the Department of 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 set by BBSP 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 website (https://www.med.unc.edu/cellbiophysio/).

Professors

Eva Anton
Albert Baldwin
Vicki Bautch
James Bear
Jay Brenman
Patrick Brennwald
Craig Cameron
Sharon Campbell
Kathleen Caron
Richard Cheney
Jean Cook
Frank Conlon
Douglas M. Cyr
Channing Der
Mohanish P. Deshmukh
James Faber
Ron Falk
Bob Goldstein
Klaus Hahn
James Hagood
Alan Jones
Tom Kash
William Kim
Richard Loeser
Chris Mack
Paul Manis
Greg Matera
Mark Peifer
Ben Philpot
Scott Randell
Juan Song
Joan Taylor
Jenny Ting
Ellen R. Weiss
Richard Weinberg
Jen Jen Yeh
Mark Zylka

Associate Professors

Wolfgang Bergmeier
Todd Cohen
Adrienne Cox
Mike Emanuele
Flavio Frohlich
Kurt Gilliland
Jimena Giudice
Stephanie Gupton
Adam Hantman
Brian Jensen
Jiandong Liu
Amy Maddox
Scott Magness
Zoe McElligott
Saskia Neher
Larry Ostrowski
Scott Parnell
Yuliya Pylayeva-Gupta

Li Qian
Stephen Rogers
Greg Scherrer
Natasha Snider
Jessica Thaxton
Scott Williams

Assistant Professors

Edward Bahnson
Katie Baldwin
Jessica Bowser
Michael Bressan
Gang Chen
Dominic Ciavatta
Sarah Cohen
Graham Diering
Rob Dowen
Whitney Edwards
Toshihide Hige
Michelle Itano
Wesley Legant
Heather McCauley
Shaun McCullough
Justin Milner
Lori O'Brien
Douglas Phanstiel

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

CBPH

CBPH 705. Improving Presentation & Communication of Scientific Results. 2 Credits.
Learning modern day techniques and approaches to convey scientific results effectively as a public speaker. Teaching how to implement the key aspects of effective presentation of scientific findings in public settings. Understanding the key components of an effective public talk including scientific content, body language, and voice. Learning how to captivate the target audience and yet still convey data driven scientific findings.

Rules & Requirements
Repeat Rules: May be repeated for credit.
Grading Status: Letter grade.
Same as: NBIO 850.

CBPH 706. Communicating Scientific Results. 1 Credits.
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.

Rules & Requirements
Repeat Rules: May be repeated for credit.
Grading Status: Letter grade.

CBPH 710. Advanced Light Microscopy. 3 Credits.
An intensive and comprehensive hands-on laboratory-oriented course in light microscopy for researchers in biology, medicine, and materials science. This course will focus on advanced quantitative fluorescence microscopy techniques used for imaging a range of biological specimens, from whole organisms, to tissues, to cells, and to single molecules. This course emphasizes the quantitative issues that are critical to the proper interpretation of images obtained with light microscopes.

Rules & Requirements
Repeat Rules: May be repeated for credit. 6 total credits. 1 total completions.
Grading Status: Letter grade.
Same as: NBIO 710.

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.

Rules & Requirements
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.

Rules & Requirements
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.

Rules & Requirements
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.

Rules & Requirements
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.

Rules & Requirements
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.

Rules & Requirements
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.

Rules & Requirements
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.

Rules & Requirements
Grading Status: Letter grade.

CBPH 855. Career and Research Enhancement Seminar (CaRES). 1-2.5 Credits.
Permission of the director of graduate studies.

Rules & Requirements
Grading Status: Letter grade.

CBPH 856. Career and Research Enhancement Seminar (CaRES). 1-2.5 Credits.
Permission of the director of graduate studies.

Rules & Requirements
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.

Rules & Requirements
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 Credits.
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.

Rules & Requirements
Grading Status: Letter grade.

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

Rules & Requirements
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.

Rules & Requirements
Repeat Rules: May be repeated for credit.
Grading Status: Letter grade.

CBPH 990. Research Practicum/Internship in Cell Biology and Physiology. 1-9 Credits.
The Research Practicum/Internship in Cell Biology and Physiology (CBPH) is a planned, individualized, mentored, evaluated, experiential learning opportunity that serves as a bridge between academic training and post-training practice. The internship/practicum provides special opportunities for learning that are different from, supplementary to, and supportive of the academic components of the PhD program.

Rules & Requirements
Requisites: Prerequisite, None; Corequisite, None; Pre- or corequisite, None.
Repeat Rules: May be repeated for credit; may be repeated in the same term for different topics; 9 total credits. 9 total completions.
Grading Status: Letter grade.

CBPH 992. Master's (Non-Thesis). 3 Credits.
Master's research for the non-thesis ("thesis substitute") track.

Rules & Requirements
Repeat Rules: May be repeated for credit.

CBPH 993. Master's Research and Thesis. 3 Credits.
Rules & Requirements
Repeat Rules: May be repeated for credit.

CBPH 994. Doctoral Research and Dissertation. 3 Credits.
Rules & Requirements
Repeat Rules: May be repeated for credit.

Contact Information

Department of Cell Biology and Physiology
Visit Program Website (http://www.med.unc.edu/cellbiophysio/)

Chair
Kathleen Caron