

## Graduate Program in Biomedical Sciences

The Graduate Program in Biomedical Sciences (GPiBS) is an interdisciplinary program offered through the Graduate College at the University of Oklahoma Health Sciences Center. It combines the expertise of over 120 participating faculty from seven participating departments and programs: biochemistry and molecular biology, cell biology, microbiology and immunology, neuroscience, pathology, physiology, and pharmaceutical sciences. GPiBS also utilizes the research expertise of the Oklahoma Medical Research Foundation. The interdisciplinary nature of this program will provide students with the breadth of knowledge and technical acumen that is highly sought in today's competitive job market. Students will graduate with a Ph.D. degree from one of the participating departments/programs to prepare them for careers in academic research, biotechnology, pharmaceutical industry, health management or teaching.

### PARTICIPATING DEPARTMENTS/PROGRAMS AND RESEARCH AREAS

**Biochemistry and Molecular Biology:** The Department of Biochemistry and Molecular Biology provides outstanding training options in the molecular basis of genetic, metabolic, viral, bacterial and parasitic diseases. Research topics include macromolecular structure; glycobiology; human genetics; transcription regulation; vascular biology; signal transduction; and intracellular trafficking.

**Cell Biology:** The Department of Cell Biology emphasizes molecular approaches to understanding basic cellular and organismal function. Current projects include developmental biology; retinal biochemistry; gene regulation; neurobiology of sensory systems; autonomic and cardiovascular pharmacology; nerve regeneration; wound regeneration; cell differentiation; vascular biology; and cell signaling mechanisms.

**Microbiology and Immunology:** The Department of Microbiology and Immunology offers graduate training in the areas of microbial infectious diseases, molecular and cellular immunology, microbial genomics/proteomics, structural biology and virology.

**Neuroscience:** The neuroscience program emphasizes a multidisciplinary approach to understand the structure and function of the normal and diseased nervous system. The diversity of research represented in this program spans three focus areas: molecular neuroscience, systems neurobiology and functional neuroscience.

**Pathology:** The study of pathology is dedicated to determining the structural, biochemical, cellular and molecular changes in cells, tissues and organs that contribute to various diseases. There are nationally acknowledged expertise and research programs in vascular cell biology; hemostasis; inflammation; immunopathology; blood brain barrier systems in Alzheimer's disease and aging; neuropathology; intracellular trafficking; autoimmunity; breast cancer biology; and tumor biology.

**Physiology:** The physiology graduate program provides comprehensive training in integrative sciences incorporating the tools and techniques of physiology with other disciplines to conduct research at the molecular, cellular, organ and whole animal levels. Research opportunities are concentrated in the following areas: neuronal control of cardiopulmonary function and pain transmission; fetal and maternal physiology; and cellular and molecular physiology.

**Pharmaceutical Sciences:** The graduate program in basic pharmaceutical sciences emphasizes the principles of pharmacology and toxicology as it relates to drug discovery, mechanism of action, development, formulation, delivery and therapy. Outstanding training opportunities exist in the related disciplines of medicinal chemistry, infectious disease, pharmaceuticals and nuclear pharmacy.

### THE CURRICULUM

During the first year, all students complete interdisciplinary course work emphasizing molecular aspects of cell and organismal biology, along with **at least** three research rotations that can span multiple programs.

For the subsequent years, students will select a specific program or department for their dissertation research. During the latter years of the program, the students will focus on their research, taking advanced classes relevant to their area of specialization, with continued interactions among the participating departments and programs through journal clubs, seminars and electives.



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## RESEARCH FACILITIES

In addition to the state-of-the-art research laboratories of individual investigators, the following core facilities are available to support the research efforts of scientists at the University of Oklahoma Health Sciences Center: DNA Sequencing/Genomics, Flow Cytometry and Imaging, Mass Spectrometry/Proteomics, and Transgenic Animal Facility.

## OKLAHOMA MEDICAL RESEARCH FOUNDATION (OMRF)

OMRF is an independent biomedical research facility specializing in the basic science of human disease. Research at OMRF includes: arthritis and clinical immunology; cardiovascular biology; cell cycle and cancer biology; free radical biology and aging; genetic models of disease; and immunobiology and cancer. Many of the faculty within each OMRF program hold adjunct appointments with the corresponding departments at the University of Oklahoma Health Sciences Center.

## FINANCIAL SUPPORT

Students in the Graduate Program in Biomedical Sciences receive full tuition waivers. In addition, graduate students receive a stipend of \$24,000 that covers reasonable living expenses in Oklahoma City and student health insurance is provided.

## ADMISSION REQUIREMENTS

- Undergraduate degree in a relevant major
- An undergraduate course in biochemistry is recommended as is experience in biomedical research
- 3.0 GPA in the last 60 hours of undergraduate degree
- GRE required (General Tests)
- Foreign applicants — TOEFL of 550 (213 computer based of 89 or higher). Also, all international transcripts must be reviewed by the World Education Service ([www.wes.org](http://www.wes.org)) on a course-by-course basis prior to acceptance.
- Three letters of recommendation
- Purpose/Goals statement
- Students are encouraged to apply by February 15<sup>th</sup> in order to secure a position in next year's class. However, late applications will be considered.

## STUDENT GROUP

Of almost 4,000 students at the Health Sciences Center, approximately 300 are graduate students in a variety of programs. There are approximately 100 graduate students enrolled in the participating departments/programs of GPiBS that include approximately 20 students in the first-year multidisciplinary GPiBS Program.

## CONTACT

Melissa Pinkston, Program Coordinator  
Graduate Programs in Biomedical Sciences  
The University of Oklahoma  
Health Sciences Center  
P.O. Box 26901, BMSB 332  
Oklahoma City, OK 73190  
Email: [melissa-pinkston@ouhsc.edu](mailto:melissa-pinkston@ouhsc.edu)  
Website: <http://www.ouhsc.edu/GPiBS>

