MPP Graduate Students 2019

Sample elective courses:

- Physiological Pharmacology (BIOL 2160)
- Biomolecular Interactions: Health, Disease and Drug Design (BIOL 1300)
- Drug and Gene Delivery (BIOL 2110)
- Stem Cell Engineering (BIOL 1150)
- Advanced Molecular and Cellular Neurobiology (BIOL 2030/2040)
- Cancer Biology (BIOL 1290)
- Advanced Biochemistry (BIOL 2270)
- Protein Biophysics and Structural Biology (BIOL 1200)
- Chemical Biology (BIOL 1230)
- In vitro Models of Disease (BIOL 2167)
- Quantitative Approaches in Biology (BIOL 2010)

Life in Providence

Providence is the state capital and second largest city in New England. Providence is an active center of art, culture, education, and politics. Brown is located in Providence's East Side on the picturesque College Hill, surrounded by dozens of historic homes and landmarks. Downtown Providence, with its popular mall, many restaurants, concert venues, train station, hotels, and scenic river-front, is just a short walk from campus. Bos-ton is only about an hour away by train or bus. Cape Cod and Newport are also nearby.

BROWN
Division of Biology and Medicine

GRADUATE PROGRAM IN MOLECULAR PHARMACOLOGY & PHYSIOLOGY

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MPP Ph.D. Program

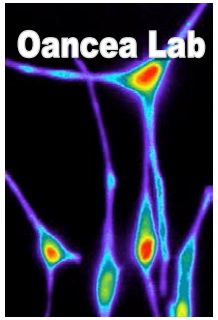
- Ph.D. program with small labs, allowing extensive, close, one-on-one faculty-student interactions
- Interdisciplinary with many state-of-the-art methods and supportive collaborations across departments
- Campus-based and hospital-based labs
- Minimal course requirements, and personalized advising, allowing curricular flexibility and customization
- Significant interactions with pharmaceutical and biotechnology companies

Examples of Research Topics

- NMR and X-ray structures of interacting proteins
- Antibiotic resistance in bacteria
- Development of novel antimicrobial therapeutics
- Development of drug and gene delivery methods
- UV light signal transduction in human skin
- Regenerative medicine, artificial organ systems
- Function and regulation of neurotransmitter receptors
- Structure, function and biophysics of ion channels
- Cancer mechanisms and therapeutics
- Therapeutics for aging and neurodegeneration
- Receptors of psychoactive drugs
- Nerve degeneration in alcoholism and Alzheimer's disease
- Biological consequences of DNA damage
- Mechanisms of drug and alcohol addiction
- Mechanisms of synaptic plasticity and brain wiring
- Genetic basis of autism and other cognitive disorders
- Nanoscale mechanical properties of cells
- Innate immune responses, immunotherapy
- Stem cell differentiation and regulation
- Mechanisms and treatment of heart and lung diseases

Have you considered Pharmacology* and Physiology?

Pharmacology and physiology deal with the physical and chemical nature of living organisms and the mechanisms of drug actions on these organisms.



These disciplines are interactive and very quantitative, applying math, physics, chemistry, and computer science to the study of biological systems.

They cover numerous fields, including neuroscience, cardiovascular and other organ systems, endocrinology, cancer, drug and gene therapy and drug abuse.

The research in our program fits within 6 general focus areas, listed here in no specific order of importance:

1. *Neuropharmacology, neurophysiology and neural circuit function*
2. *Receptor and ion channel pharmacology, physiology and signal transduction*
3. *Structures of biological molecules and their roles in disease*
4. *Translational and clinical applications of pharmacology & physiology*
5. *Chemical biology, biophysics and their applications*
6. *Cancer biology and therapeutics*

*Note: Pharmacology is *not* the same thing as Pharmacy: According to the Oxford Dictionaries, pharmacy is "the science or practice of the preparation and dispensing of medicinal drugs", but pharmacology is "the branch of medicine concerned with the uses, effects, and modes of action of drugs".

Requirements for the Ph.D. Degree

- 5 courses (grade of B or better)
- Teaching (one semester teaching assistantship)
- Research rotations in at least three laboratories
- Research Presentations
- Qualifying exam (written and oral)
- Written thesis and oral defense

Required courses:

- **BIOL 2170**, Molecular Pharmacology and Physiology
- **BIOL 2145**, Molecular Targets of Drug Discovery
- **BIOL 2410**, Current Topics in Signal Transduction
- **BIOL 2190**, Seminar in Molecular Pharmacology and Physiology (a career development course)
- **Elective Course(s)**, Chosen to match student's research and career interests (only required to take one elctive, but more are allowed)

Students also take an intensive 2-week biostatistics module in their first year.

Please refer to the MPP Guidelines for more information about research rotations, presentations, qualifying exam, and written thesis/oral defense.

GRE scores are not required.