Pharmacology, Physiology & Therapeutics
Doctor of Philosophy *

The mission of the program of the Department of Pharmacology, Physiology, and Therapeutics is to train and educate students to become successful scientists by providing a rigorous academic foundation combined with cutting-edge biomedical research training.

- **Goal 1**: Students will acquire discipline-based knowledge in pharmacology and physiology.
- **Goal 2**: Students will develop mastery of critical thinking skills.
- **Goal 3**: Students will develop the appropriate skills necessary to design experiments and interpret results.
- **Goal 4**: Students will develop appropriate communication skills.

**Admission Requirements**
1. A four-year bachelor's degree from a recognized college or university.
2. Successful completion of two semesters or equivalent course in general chemistry, and or courses in general biology, general physics, and organic chemistry.
3. Undergraduate courses in analytical chemistry, calculus, genetics, physiology, biochemistry and statistics are desirable.
4. Overall undergraduate GPA of at least 3.00.
5. GRE score on the General Test are required.
6. Satisfy the Graduate School’s English Language Proficiency requirements as published in the Graduate Catalog.
7. Students who have received a bachelor’s degree or higher from the United States or English-speaking Canada are not required to submit the TOEFL.
8. Graduate students may be admitted to either the M.S. program or directly to the Ph.D. program.
9. Students who elect to begin the M.S. program and later decide to pursue the Ph.D. before finishing the M.S. may do so by petitioning the Department Faculty. This action requires a GPA in accordance with the current academic catalog.

**Degree Requirements**
Students seeking the Doctor of Philosophy degree at the University of North Dakota must satisfy all general requirements set forth by the Graduate School as well as particular requirements set forth by the Physiology, Pharmacology, and Therapeutics Department.

The graduate requirements for a Doctor of Philosophy in Pharmacology, Physiology and Therapeutics consist of required coursework, satisfactorily passing the comprehensive exam, and research leading to the preparation of a dissertation. In addition to the general requirements listed in the Academic Catalog, the following must be completed by all candidates for the Ph.D. in Pharmacology, Physiology and Therapeutics.

1. Completion of 90 semester credits beyond the baccalaureate degree.
2. Maintenance of at least a 3.0 GPA for all classes completed as a graduate student.
3. At least one-half of the work must be in the major field.
4. Successful completion of a comprehensive examination.
5. Successful completion of dissertation.

**I. Coursework:**
Please refer to the academic catalog for a list of the required coursework.

*A student must obtain at least a “B” in PPT 500 the first time they take the course in order to remain in good standing in the PPT graduate program. If less than a “B” is received, the student may petition the PPT Graduate Faculty in order to take the course a second time.

**II. Teaching:**
The teaching requirement will be defined by the student’s Faculty Advisory Committee and will include one semester of laboratory teaching, e.g., PPT 301, or the development, presentation, and assessment of lectures related to one educational unit as defined by the instructor of record in a Pharmacology, Physiology and Therapeutics undergraduate
III. Scholarly Tools
Students must complete at least one laboratory research techniques course, e.g., PPT 505, Research Techniques at the graduate level.

IV. Research and Dissertation
The Ph.D. in Pharmacology, Physiology and Therapeutics requires completion of a dissertation based on the results of a research project completed by the graduate student under the guidance of a faculty adviser. The project must represent an original and independent investigation by the student. It is expected that the results of the research will be published in a refereed scientific journal. The dissertation prepared by the candidate must be presented and defended before the Faculty Advisory Committee and the Departmental Faculty.

Faculty and Areas of Expertise

- **Holly M. Brown-Borg, Ph.D.**, endocrine regulation of aging with emphasis on antioxidative mechanisms; and immune cell function and development
- **Colin K. Combs, Ph.D.**, mechanisms of inflammatory changes and cell death in neurodegenerative conditions with emphasis on Alzheimer’s disease
- **Van A. Doze, Ph.D.**, mechanisms underlying dopamine and norepinephrine synaptic transmission and their involvement in epilepsy and Parkinson’s disease
- **Jonathan D. Geiger, Ph.D.**, Chair, determination of underlying mechanisms and potential therapeutic interventions for sleep disorders and against neurodegenerative diseases including Alzheimer’s disease, stroke, HIV-1 dementia and traumatic brain injury
- **Othman Ghribi, Ph.D.**, elucidation of the temporal and spatial relationships between Aβ, phosphorylated tau and neuronal death and strategies for neuroprotection for the treatment of Alzheimer’s disease
- **James R. Haselton, Ph.D.**, Graduate Program Director, the central nervous system regulation of autonomic function
- **Keith Henry, Ph.D.**, Structure – Function Aspects of the Serotonin Transporter
- **Saobo Lei, Ph.D.**, modulation of synaptic transmission and plasticity of hippocampal interneuron synapses by neuromodulators, functions of interneurons in neurodegenerative diseases and synaptogenesis, dendritic integration of interneuron synapses
- **Eric J. Murphy, Ph.D.**, understanding the physiological and pathophysiological mechanisms used to maintain the lipid environment in heart and brain
- **James Porter, Ph.D.**, molecular understanding of drug potency and efficacy for ligand-receptor interactions
- **Thad Rosenberger, Ph.D.**, understand the contribution of lipid-mediated signal transduction in injury associated with neuroinflammation and use this knowledge to develop therapeutic strategies

* The Department of Pharmacology, Physiology & Therapeutics also offers a combined PhD/MD degree.

Contact Information

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Application deadlines apply!
Please visit The Graduate School website for the most current information.