DOCTOR OF PHARMACY

and

DOCTOR OF PHILOSOPHY

JOINT DEGREE PROGRAM

COLLEGE OF PHARMACY

UNIVERSITY OF FLORIDA

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March 2014
INTRODUCTION

The College of Pharmacy at the University of Florida offers a joint Doctor of Pharmacy (PharmD) and Doctor of Philosophy (PhD) degree program for qualified Doctor of Pharmacy students who are interested in accelerated graduate studies. The purpose of this program is to prepare clinically oriented pharmaceutical scientists. Through the selection of appropriate graduate level courses and attainment of research skills and experience through research clerkships, students in the Doctor of Pharmacy program can receive advanced standing in one of the graduate pharmaceutical science disciplines in the College of Pharmacy. The joint degree program could enable students to attain both degrees within a period of approximately nine years of study from the beginning of college. This includes at least two years of pre-pharmacy studies, four years of professional education, and approximately three to four years of graduate studies.

The benefits of a joint PharmD/PhD degree program are several fold: First, the student can select 5000-6000 level graduate courses that will satisfy requirements for both programs, thus shortening the length of the program. Second, the student can develop, during his/her initial years in the College of Pharmacy, an appreciation of and an aptitude in research. Third, the student can identify a research area and a faculty advisor prior to beginning the PhD component of the program. Fourth, by tracking into the PharmD/PhD program, the student can better appreciate the importance of didactic material presented in professional courses to their area of proposed graduate study and research. A further advantage of the PharmD/PhD degree over a combination of a baccalaureate in the sciences, e.g., chemistry or biology, and a PhD in the pharmaceutical sciences is that the individual would have attained a much broader range of pharmaceutical knowledge and clinical experience. The net result of this should be an individual better prepared for research in the pharmaceutical sciences with a greater potential to move rapidly upward in the pharmaceutical industry, academia or governmental agency.

CAREER OPPORTUNITIES

There is a strong demand for clinically trained individuals who also have formal research training to facilitate bench-to-bedside or translational research. Graduates with the Doctor of Pharmacy and Doctor of Philosophy degrees are very competitive for research positions in:

- Academia
- Governmental agencies (e.g., National Institutes of Health, Food and Drug Administration, Centers for Disease Control and Prevention)
- Pharmaceutical industry
- Research Foundations

The clinical emphasis of the Doctor of Pharmacy program and the in-depth scientific education obtained from a Doctor of Philosophy degree in a pharmaceutical science prepares the individual for research and teaching that could integrate clinical and pharmaceutical research. Graduates have the potential to fulfill a vital role in the pharmacy profession as clinical scientists.

A joint degree program can give the graduate the knowledge and experience for productive research, teaching, and service in a variety of positions within pharmacy. Positions in industry include research scientists in Research and Development and in Production and Quality Control. Senior level positions such as a Head of a research division or Vice President for Research or Vice President of Industry Affairs are available within a pharmaceutical company. Professorial positions in colleges of pharmacy offer the PharmD/PhD graduate opportunities for independent research, teaching, and clinical service.
Administrative and management positions in academia, the pharmaceutical industry, and in governmental agencies are attainable by graduates of a rigorous PharmD/PhD program. The authority, prestige, superior income, and influence associated with these positions can enable one to have a very significant impact on the profession of pharmacy and the health care industry.

**The University of Florida**

The University of Florida is one of the truly distinctive universities in the United States. It is among the nation’s five largest universities with an enrollment of over 50,000 students. The University has laboratories and libraries that are among the best in the nation for a faculty that includes leading scholars in their respective fields of study and research. Over 4,000 faculty members and graduate students are awarded research and training grants annually, ranking the University of Florida among the nation’s top 40 research universities. The University of Florida is a member of the Association of American Universities (AAU), the most prestigious organization in higher education. Only those universities judged to be preeminent in graduate and professional education and research are invited to membership in the AAU.

**The Health Science Center**

The Health Science Center at the University of Florida is composed of six colleges: Medicine, Nursing, Public Health and Health Professions, Pharmacy, Dentistry, and Veterinary Medicine. Patients receive health care at the UFHealth Shands Hospital, Veterans Administration Medical Center, Student Health Service, and in Jacksonville at UFHealth Jacksonville. The complex also includes a health science library with over 200,000 volumes, numerous laboratories, and one of the nation’s most comprehensive animal resource facilities. The Health Science Center provides the necessary facilities, faculty, and staff support to enable quality programs in clinical service and research.

**The College of Pharmacy**

The University of Florida, College of Pharmacy is among the top pharmacy schools in the nation and one of the few located in an academic health center encompassing most of the health professions. The College has matured to a state of excellence with more than 60 faculty members, 90 graduate students, 40 post-doctoral fellows, and 1,200 pharmacy students. The College of Pharmacy is accredited by the American Council on Pharmaceutical Education and is a member in good standing of the American Association of Colleges of Pharmacy.

The College offers a four-year, entry-level program leading to the Doctor of Pharmacy degree. A two-year pre-pharmacy program is required before acceptance into this program. The curriculum in pharmacy is designed to provide the graduate with the scientific, professional, and cultural background required for the successful practice of pharmacy. The curriculum also provides an excellent foundation for advanced study leading to careers in research, teaching, and management. Areas of emphasis in the curriculum are pharmaceutics, medicinal chemistry, pharmacodynamics, pharmacy health care administration, and pharmacy practice.

Requirements for admission to the professional program are discussed in detail in the University of Florida Undergraduate Catalog and on the College of Pharmacy website. In summary, applicants must submit all official transcripts of college course work and an application form to the University of Florida Registrar.
The College of Pharmacy will evaluate the transcripts for completion of pre-pharmacy courses, and calculate GPA's in science/math course work within the pre-pharmacy courses.

**Doctor of Pharmacy Program**

The Doctor of Pharmacy program is designed to produce practitioners whose skills, judgment, self-confidence, and knowledge allow an enhanced patient-oriented pharmacy practice. Coursework includes physiological basis of disease, biochemistry, microbiology-immunology, pharmaceutics, biopharmaceutics, pharmacokinetics, medicinal chemistry, pharmacology, biostatistics, pharmacotherapy, physical assessment, medication use processes, pharmacy calculations, compounding and parenterals, nonprescription products, quality assurance, professional communications, pharmacy management, a pharmaceutical outcomes evaluation and pharmacy law and ethics. In addition, eleven months of clerkship experiences are required. These clerkships include a required core of general medicine, pediatrics, ambulatory care, and drug information services. Elective clerkships may include research and administrative experiences.

**Doctor of Pharmacy/Doctor of Philosophy Program**

Students enrolled in the PharmD/PhD program may take graduate level courses and up to four months of research clerkships. Students may receive advanced graduate course credit in a PhD program by taking appropriate 5000 and 6000 level courses as elective courses in the PharmD program. Students can complete graduate courses and pursue research in the departments of Pharmaceutics, Medicinal Chemistry, Pharmacodynamics, and Pharmacy Health Care Administration.

**Typical Curriculum**

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<th>Year</th>
<th>Fall</th>
<th>Spring</th>
<th>Summer</th>
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<tbody>
<tr>
<td>1</td>
<td>PharmD Courses</td>
<td>PharmD Courses</td>
<td>Research (optional)</td>
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<tr>
<td>2</td>
<td>PharmD Courses</td>
<td>PharmD Courses</td>
<td>Research (optional)</td>
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<tr>
<td>3</td>
<td>PharmD &amp; PhD Courses</td>
<td>PharmD</td>
<td>PharmD Experiential</td>
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<td>4</td>
<td>PharmD Experiential&lt;sup&gt;1&lt;/sup&gt; &amp; PhD courses</td>
<td>PhD Courses</td>
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<td>5</td>
<td>PhD Courses</td>
<td>PhD Courses</td>
<td>Research &amp; PhD Courses</td>
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<td>6</td>
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<td>7+</td>
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<sup>1</sup> Students may take up to four one-month research rotations. Two months of research rotation during spring of the fourth professional year are encouraged.

**Application Process**

It is strongly recommended that students interested in the PharmD/PhD program begin the process of working with the Executive Associate Dean or graduate coordinator of a selected graduate program in the College (see below) as early as the Fall semester of their first academic year. This will allow a student...
to engage in summer experiential research training that is potentially funded, as well as provide valuable
time to get to know graduate faculty in a given Department.

Students interested in the PharmD/PhD joint degree program can apply anytime within their second
professional year but should apply no later than the beginning of the third professional year in the PharmD
program to the College of Pharmacy department in which they plan to complete their PhD degree.

**APPLICATION PROCESS OVERVIEW**

**During 2PD or 3PD year**
Apply directly to Department in the College of Pharmacy

**During 4PD year**
Apply directly to University Office of Graduate Admissions (after consultation with relevant Department
graduate coordinator)

**Admission Requirements**

- Completion of at least three semesters of PharmD curriculum (or prior degree)
- Competitive Graduate Record Examination (GRE) score
- GPA of at least 3.20

When applying during the second or third professional year, the following application material must be
submitted directly to the College of Pharmacy department to which you are applying.

- [UF Graduate School application form](#)
- Copy of transcripts and GRE score.
- A statement of intent explaining why you would like to pursue a PhD degree. If a particular faculty
  member has a research focus that interests you, please indicate this in your statement.
- Three letters of recommendation from individuals who are familiar with the candidate and who
  can comment on their appropriateness for graduate studies.

Students admitted to the joint degree program will apply for admission to the UF [Graduate School](#) during
the fourth professional year. For more information on admission to the Graduate School consult the
University of Florida Graduate Catalog.

Students may initiate application to the PharmD/PhD program by contacting one of the graduate
coordinators or chairpersons in each of the departments that offer a PhD in the Pharmaceutical Sciences. **Early contact** is recommended in order to plan the course of study and to take full advantage of 5000-
6000 course offerings so that the maximum of 16 credits can be credited toward graduate course
requirements while in the Doctor of Pharmacy program. Please note that courses taken outside of the
PharmD curriculum may incur an additional tuition charge.

Students accepted into the PharmD/PhD program will be guaranteed a stipend (either a research or
teaching assistantship) and tuition remission to help finance expenses for graduate studies. This stipend
is granted once the student has completed the Doctor of Pharmacy degree and has begun further
graduate studies in the College of Pharmacy.
Department of Medicinal Chemistry
Graduate Coordinator: Dr. Henrik Luesch (luesch@cop.ufl.edu)

The College of Pharmacy offers the Doctor of Philosophy degree in pharmaceutical sciences with a concentration in medicinal chemistry. Medicinal chemistry is a unique blend of the physical and biological sciences. The scope of the field is sufficiently broad to give students with many different science backgrounds a rewarding and challenging program of study. Areas of active research include organic synthesis of medicinal agents, metal chelate design, drug metabolism, molecular toxicology, molecular biology, combinatorial chemistry, neurochemistry, analytical chemistry, molecular modeling, natural products, and drug discovery. The applicant should have an undergraduate degree in pharmacy, chemistry, biology, or premedical sciences. A background in calculus, physics, general and organic chemistry is required.

In addition to graduate medicinal chemistry courses in the College of Pharmacy, graduate courses in chemistry and biochemistry are required for the program. The Department participates in the interdisciplinary concentration in toxicology. For more information, see the Interdisciplinary Graduate Studies section of the graduate catalogue.

Department of Pharmaceutics
Graduate Coordinator: Tony Palmieri, Ph.D. (palmieri@cop.ufl.edu)

Pharmaceutics can be defined as the scientific endeavor concerned with the design, formulation, evaluation, and use of drug delivery systems. A foundation in physical chemistry, chemistry, mathematics, biology, as well as the life sciences, is necessary. The domain extends from studies of the physiochemical properties of drugs and related molecules to investigations of the mechanisms of physiological processes affecting drug delivery and therapeutic effectiveness. These include absorption, distribution, metabolism and excretion. Pharmaceutics is an interdisciplinary field of research. In addition to the above mentioned fields, pharmaceutics is rapidly expanding into such areas as computer sciences, biotechnology, cell and molecular biology, and biomedical engineering. The variety of basic, applied and clinical research projects reflects the interdisciplinary character and orientation of pharmaceutics towards emerging new fields in the pharmaceutical sciences, in particular pharmacokinetics, and pharmacometrics.

The Department of Pharmaceutics consists of faculty members who conduct research in a variety of areas of pharmaceutical science. These areas of research include studies to determine the correlation of pharmacokinetic and pharmacodynamic behavior of drugs; to assess drug stability; pharmacometrics; to evaluate the interactions of drugs with macromolecules; cellular drug delivery; to develop novel drug delivery systems including liposomes, microemulsions, and mixed-micelles.

The Pharmaceutics Department offers the following graduate courses: Clinical Pharmacokinetics, Biopharmaceutics, Pharmacokinetics and Biopharmaceutics, Stability and Kinetics of Drugs, Pharmaceutical Analysis I and II, Equilibria, Complexations, and Interactions of Drugs, Parenterals, Pharmaceutical Biotechnology, Pharmaceutical Product Formulation, Advanced Topics in Pharmaceutical Sciences.
Department of Pharmacotherapy and Translational Research
Graduate Coordinator: Taimour Langaee, Ph.D. (langaee@cop.ufl.edu)

The College of Pharmacy offers the Doctor of Philosophy degree in pharmaceutical sciences with a concentration in Clinical Pharmaceutical Sciences. The goal of this program is to prepare motivated individuals to pursue independent research careers in academia, industry, or government. The current research focus of the program is on understanding genetic and non-genetic factors that contribute to variability in drug response. Selected areas of research include cardiology, oncology, asthma/pulmonary, infectious diseases, psychiatry, and clinical pharmacology/drug metabolism. Students in the program conduct hypothesis-driven clinical research that includes a strong laboratory component. Excellent research facilities are available including state-of-the art bioanalytical and pharmacogenomics laboratories, and an NIH-funded Clinical Translational Science Institute (CTSI) and Clinical Research Center (UF CRC) for clinical study conduction.

Department of Pharmaceutical Outcomes and Policy
Graduate Coordinator: Almut Winterstein, Ph.D. (almut@cop.ufl.edu)

Research in Pharmaceutical Outcomes and Policy involves health outcomes research, which crosses disciplinary boundaries and focuses on evaluating the, effectiveness, safety, humanistic outcomes and cost outcomes of drug therapy, medical technologies and pharmacy related health services. Specialty areas in the department are:

- Pharmacoepidemiology
- Pharmacoeconomics
- Patient Safety and Program Evaluation

Pharmacoepidemiology focuses on the assessment of safety and effectiveness of medications after market approval. It typically studies drug effects in large populations using existing data sources such as administrative billing or electronic health record (EHR) data. A concentration in pharmacoeconomics equips a graduate to design studies that assess the economic burden of illness or compare cost and benefit of alternative treatment strategies. Research in patient safety and program evaluation examines medication errors and quality of care issues surrounding medication use. It also evaluates interventions and policy intended to enhance the safe and effective use of medications.

Department of Pharmacodynamics
Graduate Coordinator: Jason Frazier, Ph.D. (frazier@cop.ufl.edu)

Research in the Department of Pharmacodynamics broadly seeks to improve our understanding of physiology, pathophysiology, and drug action in neural, cardiovascular, and endocrine systems. We study specific systems, circuits, and/or mechanisms that are implicated in a wide variety of clinical conditions including drug dependence and withdrawal, diabetes, dehydration, epilepsy, hypertension, obesity, Parkinson’s disease, pregnancy, and advanced age. Active projects in the department employ a variety of anatomical, immunohistochemical, electrophysiological, behavioral, surgical, and genetic approaches and involve both in vivo and in vitro systems. Graduate course work in the Department has core requirements centered on physiology, pharmacology, neuroscience, and statistics. In addition, our students routinely participate in elective courses hosted by programs throughout the Health Sciences Center.