UNC ESHELMAN SCHOOL OF PHARMACY (GRAD)

The UNC Eshelman School of Pharmacy offers graduate programs leading to the master of science in pharmaceutical sciences with a specialization in health-system pharmacy administration and to the doctor of philosophy in pharmaceutical sciences with concentrations in one of four research areas: chemical biology and medicinal chemistry; pharmacoengineering and molecular pharmaceutics; pharmacotherapy and experimental therapeutics; or pharmaceutical outcomes and policy. Students from the master of science in pharmaceutical sciences with a specialization in health-system pharmacy administration are competitive for careers in administrative positions in hospital pharmacies and other health systems. Students in from the Ph.D. program are competitive for careers in academia, pharmaceutical companies, biotech companies, government agencies such as the FDA, CDC, and NIH, nonprofit research organizations, and a variety of alternative careers including patent law, venture capital, and entrepreneurialism.

Instruction emphasizes contemporary research methods, study design, and results and is delivered in the form of small group lectures/discussions, group activities and recitations, and seminars combined with intensive laboratory-based research. The excellent rapport that exists between schools, departments, institutes, and centers within the University facilitates interdisciplinary collaborative research by graduate students and faculty. The graduate degree programs also benefit from faculty affiliations with GlaxoSmithKline, Inc., the Research Triangle Institute, the Hamner Institutes for Health Sciences, Duke University, the Wake Forest University School of Medicine, and many other organizations in the Research Triangle Park area. The UNC Eshelman School of Pharmacy is housed in Beard Hall, Kerr Hall, Marsico Hall, and the Genetic Medicine Building, which are located on the health sciences campus together with the Adams Schools of Dentistry, the School of Medicine, the School of Nursing and the Gillings School of Global Public Health. The Health Sciences Library has an outstanding collection of books and journals as well as computer and support services. Library and laboratory resources residing in other University departments are also available for use by students and faculty.

Admission to the Ph.D. Program

Applicants who have completed a standard collegiate curriculum in pharmacy, chemistry, biochemistry, biology, engineering, public health, or in an allied field in the University, or in other universities or colleges having curricula acceptable to UNC-Chapel Hill’s Graduate School, are eligible for admission to the graduate program in pharmaceutical sciences. Applicants must submit letters of recommendation, official transcripts, and a statement of personal goals as they relate to graduate study at the UNC Eshelman School of Pharmacy. The GRE is not required.

The Graduate School online application (http://gradschool.unc.edu/admissions/) is the standard means of applying for admission. Inquiries concerning admission to programs in the pharmaceutical sciences may be directed to the Office of Student Affairs at ocsa@unc.edu.

All applications to the UNC Eshelman School of Pharmacy’s Ph.D. in pharmaceutical sciences program must be submitted through the UNC Graduate School.

Deadlines

Applications typically open in early August and review of applications begins December 1. The official deadlines can be found on the UNC Eshelman School of Pharmacy’s website (https://pharmacy.unc.edu/education/phd/apply-now/).

Application Requirements

- Graduate School application
- Nonrefundable $95.00 application fee. Fee scholarships are available. Please contact Will Taylor at ocsa@unc.edu for more information.
- Three current letters of recommendation. When filling out the Graduate School application, applicants will be asked to submit the email addresses of the recommenders, who will then receive an email with information for logging into the system to submit their letters.
- Transcripts
- Statement of purpose. (See below.)
- A current email address. (The Graduate School only uses email to communicate with applicants.)

Notes

- For Question 2 on the application, make sure you scroll down the list until you see “School of Pharmacy.” In the dropdown menu for School of Pharmacy, please select Pharmaceutical Sciences.
- Applicants must indicate only one choice on their application for their division of interest or specialization. Only the first choice of sub plan (i.e., area of interest or specialization) will be considered on their application. Applicants should also describe this choice in their statement of purpose.
- Being admitted to The Graduate School does not imply that you will receive financial assistance of any kind. The awarding of financial assistance is a separate decision.

Questions

Consult the Graduate School's application instructions (http://gradschool.unc.edu/admissions/instructions.html) or contact gradinfo@unc.edu.

Statement of Purpose

To assist in the evaluation of your application, please provide a concise personal statement including the following information.

- Why do you wish to pursue graduate study in pharmaceutical sciences?
- Why do you wish to engage in graduate study at this institution?
- What are your reasons for selecting your first choice of sub plan (i.e., area of interest or specialization)?
- What do you offer that will enrich our graduate program? Please include factors such as:
  - Work, teaching, or other life experiences
  - Meaningful events that have influenced your life and career choices
  - Communication abilities
  - Problem-solving skills
  - Are you a leader, follower, or team player?
  - History of overcoming challenges or disadvantages
  - Cultural diversity (this may include ethnic background, race, and other attributes that define your cultural background)
Admission to the M.S. Program

Applicants to the master's program must meet both of the following requirements:

1. Be a licensed pharmacist in the U.S.
2. Hold a Doctor of Pharmacy (Pharm.D.) or the equivalent

Everything detailed below must be completed prior to the deadline for your application to be considered.

Interested applicants will need to apply to the University of North Carolina Graduate School for their didactic component. The applicant will also need to complete separate applications for each residency program to which they wish to apply — UNC Hospitals, Duke University Health System, Wake Forest Baptist Hospital, Mission Health in Asheville, or Moses Cone in Greensboro. Applicants need only to apply to their residency programs of interest.

Individual interview days will be scheduled at times convenient for applicants and institutions. Each applicant and program will communicate to identify the ideal time to conduct the interview. Our hope is to have all of the interviews for an applicant in one consecutive period.

Each program will participate in the match, but each one has a different match number. If you have not done so already, please make sure to register for the National Matching Service offered through ASHP. Currently there are four positions available at UNC, one at Duke, two at Wake Forest, one at Mission Health, and one at Moses Cone, for a total of nine per cohort.

Application Procedures

- Complete a Graduate School application for admission (see link below)
- Create an online account
- Fill out the application information as follows:
  - Level of Study: Graduate
  - Type of Applicant: New degree-seeking applicant
  - Major: Pharmaceutical Sciences
  - Degree: Master of Science
  - Area of Interest or Specialization: Practice Advancement and Clinical Education
- Select the term of entry
- Fill out the applicant information
- Fill out educational background
- Upload your unofficial transcripts — undergraduate and graduate
- Upload a statement of purpose
- GREs are not required
- Upload a copy of your CV/resume
- Submit the application and pay the non-refundable $85 application fee
- Provide three letters of recommendation (may be identical to those provided for the residency program application) using the recommendations link on the online application under “Important Links”

- If possible, please identify the specific research areas in which you plan to focus your graduate studies. Is there a particular faculty member with whom you would like to work?

Graduate Assistantships and Fellowships in the UNC Eshelman School of Pharmacy

Research assistantships in the UNC Eshelman School of Pharmacy provide a competitive stipend, health insurance, tuition, and fees for 12 months’ service. All awards are made on a competitive basis with consideration given to the applicant’s academic record and research experience. Information concerning these assistantships, fellowships, and traineeships may be obtained by writing directly to the Office of Research and Graduate Education at the UNC Eshelman School of Pharmacy.

Chemical Biology and Medicinal Chemistry

Chemical biology and medicinal chemistry are multidisciplinary fields that integrate organic chemistry, biochemistry, molecular biology, structural biology, pharmacology, and physiology. The research in the division applies and extends the basic concepts of chemistry, biochemistry, and pharmacology to the investigation of biomedical problems. General areas of study include structure-activity relationships, drug-receptor interactions, synthetic drug design, and target discovery and validation. Specific focus areas include cancer chemotherapy, computer-aided drug design, enzymology, glycochemistry, molecular modeling, natural products, neurochemistry, parasitology, and structural biology.

Pharmacoengineering and Molecular Pharmaceutics

Pharmacoengineering and molecular pharmaceutics represents interdisciplinary specialties encompassing a range of scientific endeavors, including the design, fabrication, evaluation, use of, and delivery strategies for dosage forms; elucidation of the behavior of pharmacologic agents in biologic systems; determination of the ability of pharmacologic agents to reach the relevant site of biologic effect; and determination of the time course of biologic activity.

These areas of specialization represent critical steps in the development of new therapeutic agents, the evaluation of new and existing drugs, and the optimal clinical use of pharmacologic agents.

Students in the Division of Pharmacoengineering and Molecular Pharmaceutics are required to participate in a common core of entry-level graduate courses. This core provides a broad perspective of the pharmaceutical sciences as well as an appreciation for how different subdisciplines interact. Many dissertation projects are collaborative in nature and rely upon interactions with faculty in other divisions of the UNC Eshelman School of Pharmacy, as well as with colleagues in the UNC School of Medicine, the Department of Chemistry, or at pharmaceutical companies or institutions located in the Research Triangle Park area.

Pharmaceutical Outcomes and Policy

The Division of Pharmaceutical Outcomes and Policy offers a Ph.D. program in pharmaceutical sciences emphasizing an interdisciplinary approach to addressing issues relevant to medication use at the patient, provider, community, and societal levels. Faculty research
interests and course offerings reflect this interdisciplinary orientation. Students develop knowledge and skills that enable them to conduct high quality research directed at improving the use and cost effectiveness of medications, technology, and services. Education and research in the division draws heavily upon expertise in numerous fields such as health services research, health policy, health communication, health behavior and behavior change, epidemiology, and psychometrics. Areas of faculty and student research include communication and decision making, comparative effectiveness of medications and pharmacy practice models, medication adherence and self-management, health disparities, health literacy, patient reported outcomes assessment, pharmaceutical policy analysis, and policy and ethical issues related to pharmacogenomics.

Pharmacotherapy and Experimental Therapeutics
The Division of Pharmacotherapy and Experimental Therapeutics offers a Ph.D. program in the pharmaceutical sciences with a focus on translational research that integrates biomedical and pharmaceutical sciences in both laboratory-based models and in humans. The goal of the program is to develop scientists who are prepared to generate and disseminate new knowledge in pharmacotherapy and accelerate its application to improve patient care. Graduate students engage in clinical experiences throughout the program that are designed to complement each student’s research interests while also facilitating their development as translational scientists. Areas of graduate coursework and research include drug metabolism and transport, pharmacokinetics/pharmacodynamics/pharmacometrics, pharmacogenomics, clinical research, drug development, experimental therapeutics, and mechanisms of drug toxicity. Therapeutic and research areas of particular strength include cardiovascular disease, infectious disease/HIV, oncology/hematology, hepatology/gastroenterology/transplant, and pulmonary disease.

Master of Science in Pharmaceutical Sciences
The Eshelman School of Pharmacy offers a master of science in pharmaceutical sciences with a specialization in health-systems pharmacy.

The M.S. program prepares future health care leaders to manage highly complex and multifaceted pharmacy enterprise operations. To accomplish this goal, the program provides students with the knowledge, skills, and experience necessary to assume a variety of roles and responsibilities. Graduates serve as vibrant, committed professionals with a focus on improving patients’ health, health care delivery, and the profession of pharmacy. This occurs through both didactic education and experiential opportunities in class and in the workplace.

The residential M.S. program is designed for full-time students with a Pharm.D. degree who are seeking residency training experience.

The fully online M.S. program is designed for working professionals with a pharmacy degree who want to secure their degree while working.

Distinguished Professors
Krissy Ainslie, Pharmacoeengineering and Molecular Pharmaceutics
Jeffrey Aube, Chemical Biology and Medicinal Chemistry
Kim Brouwer, Pharmacotherapy and Experimental Therapeutics
Stefanie Ferreri, Practice Advancement
Stephen Frye, Chemical Biology and Medicinal Chemistry
Leaf Huang, Pharmacoeengineering and Molecular Pharmaceutics
Michael Jay, emeritus, Pharmacoeengineering and Molecular Pharmaceutics
Alexander Kabanov, Pharmacoeengineering and Molecular Pharmaceutics
David Lawrence, Chemical Biology and Medicinal Chemistry
Jian Liu, Chemical Biology and Medicinal Chemistry
Denise Rhoney-Metzger, Practice Advancement
Betsy Sleath, Pharmaceutical Outcomes and Policy
Alexander Tropsha, Chemical Biology and Medicinal Chemistry

Professors of the Practice
John Bamforth, Eshelman Institute for Innovation
Jon Easter, Practice Advancement
Anthony Hickey, UNC Catalyst for Rare Disease
Stephanie Kiser, Practice Advancement

Professors
Jennifer Elston-Lafata, Pharmaceutical Outcomes and Policy
Timothy Ives, Practice Advancement
Samuel Lai, Pharmacoeengineering and Molecular Pharmaceutics
Andrew Lee, Chemical Biology and Medicinal Chemistry
Craig Lee, Pharmacotherapy and Experimental Therapeutics
Mary McClurg, Practice Advancement
James H. Patterson, Pharmacotherapy and Experimental Therapeutics
Paul Watkins, Pharmacotherapy and Experimental Therapeutics

Associate Professors
Albert Bowers, Chemical Biology and Medicinal Chemistry
Delesha Carpenter, Pharmaceutical Outcomes and Policy
Gang Fang, Pharmaceutical Outcomes and Policy
Daniel Gonzalez, Pharmacotherapy and Experimental Therapeutics
Nathaniel Hathaway, Chemical Biology and Medicinal Chemistry
Erin Heinen Cox, Pharmacotherapy and Experimental Therapeutics
Shawn Hingtgen, Pharmacoeengineering and Molecular Pharmaceutics
Federico Innocenti, Pharmacotherapy and Experimental Therapeutics
Michael Jarstfer, Chemical Biology and Medicinal Chemistry
Rhé Li, Chemical Biology and Medicinal Chemistry
Jacqueline McLaughlin, Practice Advancement
Juliane Nguyen, Pharmacoeengineering and Molecular Pharmaceutics
Sachiko Ozawa, Practice Advancement
Robert Shrewsbury, Practice Advancement
Scott Singleton, Chemical Biology and Medicinal Chemistry
Philip Smith, Pharmacoeengineering and Molecular Pharmaceutics
Kathleen Thomas, Pharmaceutical Outcomes and Policy
Carolyn Thorpe, Pharmacoeengineering and Molecular Pharmaceutics
Joshua Thorpe, Pharmaceutical Outcomes and Policy
Dennis Williams, Pharmacotherapy and Experimental Therapeutics
Timothy Wilshire, Pharmacotherapy and Experimental Therapeutics
William Zamboni, Pharmacotherapy and Experimental Therapeutics
Qiusheng Zhang, Chemical Biology and Medicinal Chemistry

Assistant Professors
Aaron Anselmo, Pharmacoeengineering and Molecular Pharmaceutics
Yanguang Cao, Pharmacotherapy and Experimental Therapeutics
Daniel Crona, Pharmacotherapy and Experimental Therapeutics
Julie Dumond, Pharmacotherapy and Experimental Therapeutics
Klarissa Jackson, Pharmacotherapy and Experimental Therapeutics
Lindsey James, Chemical Biology and Medicinal Chemistry
Alan Kinlaw, Pharmaceutical Outcomes and Policy
Robert McInty, Chemical Biology and Medicinal Chemistry
Subjects in this school include: Chemical Biology and Medicinal Chemistry (CBMC) (p. ), Pharmacoengineering and Molecular Pharmaceutics (DPOP) (p. ), Pharmacoengineering and Experimental Therapeutics (DPET) (p. ), Practice Advancement and Clinical Education (PACE) (p. ), Pharmaceutical Outcomes and Policy (DPOP) (p. ), and Pharmaceutical Sciences (PHRS) (p. ).

Note that the courses listed below are not listed in the order and number of times that they must be completed. See the program’s website for more detailed information about the sequence of courses and credit hour totals. The program’s website also provides information about concentrations.

### Chemical Biology and Medicinal Chemistry

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>CBMC 807</td>
<td>Foundations of Chemical Biology I: Organic and Medicinal Chemistry</td>
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<tr>
<td>CBMC 805</td>
<td>Molecular Modeling</td>
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Graduate level Biology course

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<tr>
<th>Code</th>
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<tbody>
<tr>
<td>PHRS 801</td>
<td>Foundations for Cross-Disciplinary Training in the Pharmaceutical Sciences</td>
<td>1-3</td>
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<tr>
<td>CHEM 701</td>
<td>Introduction to Laboratory Safety</td>
<td>1</td>
</tr>
<tr>
<td>PHRS 899</td>
<td>Seminar in Pharmaceutical Sciences</td>
<td>1</td>
</tr>
<tr>
<td>PHRS 991</td>
<td>Research in Pharmaceutical Sciences</td>
<td>1-9</td>
</tr>
<tr>
<td>CBMC 804A</td>
<td>Biochemical Foundations of Chemical Biology</td>
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<tr>
<td>CBMC 804B</td>
<td>Biochemical Foundations of Chemical Biology Journal Club</td>
<td>1</td>
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<tr>
<td>PHRS 994</td>
<td>Doctoral Research and Dissertation</td>
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### Pharmacotherapy and Experimental Pharmaceutics

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<thead>
<tr>
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<tbody>
<tr>
<td>PHRS 801</td>
<td>Foundations for Cross-Disciplinary Training in the Pharmaceutical Sciences</td>
<td>1-3</td>
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Pharmaceutical Outcomes and Policy

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<tr>
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<tbody>
<tr>
<td>DPOP 803</td>
<td>Social and Behavioral Aspects of Pharmaceutical Use</td>
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<tr>
<td>DPOP 806</td>
<td>Pharmaceutical Policy</td>
<td>3</td>
</tr>
<tr>
<td>DPOP 872</td>
<td>Proposal Writing in DPOP</td>
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<tr>
<td>DPOP 870</td>
<td>Pharmaceutical Outcomes Research</td>
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</tr>
<tr>
<td>EPID 710</td>
<td>Fundamentals of Epidemiology</td>
<td>3</td>
</tr>
<tr>
<td>EPID 705</td>
<td>Introduction to Deductive and Probability Logic in Epidemiology</td>
<td>2</td>
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<tr>
<td>EPID 715</td>
<td>Theory and Quantitative Methods in Epidemiology</td>
<td>4</td>
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<tr>
<td>EPID 716</td>
<td>Epidemiologic Data Analysis</td>
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</tr>
<tr>
<td>EPID 765</td>
<td>Methods and Issues in Pharmacoepidemiology</td>
<td>3</td>
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<tr>
<td>PHRS 815</td>
<td>Foundations in Implementation Science: Examples in Precision Health and Society</td>
<td>1.5</td>
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<tr>
<td>PHRS 899</td>
<td>Seminar in Pharmaceutical Sciences</td>
<td>1</td>
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<tr>
<td>PHRS 991</td>
<td>Research in Pharmaceutical Sciences</td>
<td>1-9</td>
</tr>
<tr>
<td>PHRS 994</td>
<td>Doctoral Research and Dissertation</td>
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Practice Advancement and Clinical Education (Master's Program)

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<tr>
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<th>Title</th>
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<tbody>
<tr>
<td>PACE 815</td>
<td>Evaluation Research and Project Design</td>
<td>3</td>
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<tr>
<td>PACE 820</td>
<td>Health-System Pharmacy Leadership</td>
<td>3</td>
</tr>
<tr>
<td>PACE 825</td>
<td>Foundational Practices of a Successful Health-System Department of Pharmacy</td>
<td>4</td>
</tr>
<tr>
<td>PACE 832</td>
<td>Financial Management of Health-system Pharmacy</td>
<td>3</td>
</tr>
<tr>
<td>PACE 833</td>
<td>Overview of Health Systems</td>
<td>3</td>
</tr>
<tr>
<td>PACE 860</td>
<td>Advanced Hospital Pharmacy Operations</td>
<td>3</td>
</tr>
<tr>
<td>PHRS 899</td>
<td>Seminar in Pharmaceutical Sciences</td>
<td>1</td>
</tr>
<tr>
<td>PHRS 991</td>
<td>Research in Pharmaceutical Sciences</td>
<td>1-9</td>
</tr>
<tr>
<td>PHRS 992</td>
<td>Master's (Non-Thesis)</td>
<td>3</td>
</tr>
</tbody>
</table>

Contact Information

UNC Eshelman School of Pharmacy
Visit Program Website (http://pharmacy.unc.edu)

Assistant Dean for Graduate Studies
Michael Jarstfer
jarstfer@unc.edu