

# UNT | HEALTH<sup>TM</sup> SCIENCE CENTER

GRADUATE SCHOOL OF BIOMEDICAL SCIENCES

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DEPARTMENT OF PHARMACEUTICAL SCIENCES

& DEPARTMENT OF PHARMACOTHERAPY

UNT SYSTEM COLLEGE OF PHARMACY

***PHARMACEUTICAL SCIENCES & PHARMACOTHERAPY  
GRADUATE PROGRAM  
GRADUATE STUDENT HANDBOOK***

***2017-2018***

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## 1. INTRODUCTION

Policies and procedures set forth in this document pertain to all students in the Graduate Program of Pharmaceutical Sciences & Pharmacotherapy at the University of North Texas Health Science Center (UNTHSC). These policies and procedures are in addition to those of the Graduate School of Biomedical Sciences (GSBS). Thus this Pharmaceutical Sciences & Pharmacotherapy Graduate Student Handbook is a supplement to the GSBS Graduate Student Handbook. Students are referred to that handbook for general policies of the institution. All students should familiarize themselves with both the departmental and Graduate School handbooks.

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## 2. PROGRAM DESCRIPTION

The Pharmaceutical Sciences & Pharmacotherapy Graduate Program is an interdisciplinary program that offers both MS and PhD degrees. The goal of this program is to provide students with rigorous education and training in biomedical sciences with a specialty in Pharmaceutical Sciences and Pharmacotherapy. Students receive training through original research, formal classroom education, problem-based learning, seminars, and journal clubs. The program includes faculty members engaged in various aspects of basic and clinical research in Pharmaceutical Sciences and Pharmacotherapy.

The specific research interests of faculty cover a wide range of topics including, but are not limited to, cancer stem cell biology, drug target identification, natural product discovery, design and synthesis of new drug molecules, mechanistic studies of drug action (pharmacology), drug analysis, drug formulation and drug delivery, drug metabolism, drug resistance, pharmacokinetics, pharmacodynamics, and pharmacogenomics, etc. The interdisciplinary research also includes investigation of the link between and among different categories of human diseases, such as cancer, aging-related disease, HIV, metabolic and ocular diseases. The research projects employ state-of-the-art chemical, biochemical, molecular, cellular, in vivo and clinical techniques that include computer-aided drug design, total synthesis, fermentation, chromatography, mass spectrometry, NMR, molecular cloning, gene targeting, FACS analysis, advanced fluorescence spectroscopy, optical imaging and advanced single cell technology, behavioral testing, cellular reprogramming, nanoparticle characterization, and organoid modeling, etc.

Students may enter the program with a variety of academic backgrounds, providing that they have fulfilled prerequisite courses. The graduate training program involves core courses that integrate key concepts of biochemistry, cell biology, molecular biology, genetics, physiology, pharmacology, immunology, microbiology, and cell biology, as well as advanced courses in pharmaceutical sciences and pharmacotherapy. Students participate in seminars and discussion of current research and receive extensive laboratory training. Students perform original, publishable research and present their research findings at national scientific meetings. In addition, students are required to present their research at the annual UNTHSC Research Appreciation Day (RAD) and during the department's regular Works in Progress (WIPs) presentations. Approximately two years are required to complete the Master of Science degree, while the Doctor of Philosophy degree is normally completed in approximately five years.

Students who successfully complete a graduate degree in Pharmaceutical Sciences and Pharmacotherapy will be well prepared for careers in academic and government research laboratories, as well as in the pharmaceutical/ biotechnology industry.

**Graduate Faculty:** Chaturvedula; Cheng; Clay; Dong; Ellis; Emmitte; Liu; Pang, Prokai-Tatrai; Simecka; Wang; White; Wu; Yan

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## Research Interests of Graduate Faculty

**Ayyappa Chaturvedula, PhD**  
Associate Professor  
Pharmacotherapy





I have received a Bachelor's degree in Pharmacy from the University of Pharmaceutical Sciences, Kakatiya University, India, and a PhD in Pharmaceutical Sciences from Mercer University, Atlanta, GA. I received advanced training in Pharmacometrics as a visiting scientist in the Department of Bioengineering and Therapeutic Sciences, School of Pharmacy, University of California San Francisco, in association with the Center for Drug Development Science (CDDS). Prior to my current position, I have worked in pharmaceutical industry and academia in various positions. My research has been focused on drug delivery and pharmacokinetic-pharmacodynamic modeling since my graduate training. I have experience in developing transdermal, nasal, buccal and sublingual delivery systems using *in vitro* permeation models and utilizing pharmacokinetic models to simulate *in vivo* concentrations of drugs. I have significant experience in developing population pharmacokinetic models and applying mechanistic mathematical models to understand intracellular pharmacokinetics of metabolites.

**Yi-Qiang (Eric) Cheng, PhD**  
Professor and Graduate Advisor  
Pharmaceutical Sciences,  
Biochemistry & Cancer Biology,  
Microbiology



The overall goal of my group research is to discover and develop bioactive natural products as drugs or drug leads for the treatment of human diseases. To this end, we have so far discovered a serial of potent histone deacetylase inhibitors, and a serial of potent pre-mRNA splicing inhibitors, among many other natural products from exotic bacterial species. We forged collaborations with cancer biologists to evaluate some of those small molecules in tumor xenograft models, including neuroendocrine cancer, breast cancer, colon cancer, prostate cancer, glaucoma, leukemia and neuroblastoma. Our research has been generously supported by NIH grants (R03, R01, CTSA), a US Department of Defense BCRP Idea Award, a pilot grant from the Lynde and Harry Bradley Foundation, and supplemented with institutional funds. I have so far coauthored more than 50 peer-reviewed publications and several book chapters. One of our publications was recognized as "The 2013 A. E. Schwarting Award for the *Journal of Natural Products* Best Paper of the Year". I am also an inventor in several issued US and international patents, and pending patents. Students of my group will gain broad training in microbiology, molecular biology, biochemistry and natural product chemistry.

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| <p><b>Patrick G. Clay, PharmD</b><br/> Professor<br/> Pharmacotherapy,<br/> Microbiology &amp; Immunology</p> | <p>Dr. Clay received formal training in the field of pharmacy (BPharm, University of Louisiana-Monroe; a PharmD, an Infectious Diseases Residency and a Fellowship in Pharmacotherapy of Infectious Diseases &amp; Clinical Research through the University of Oklahoma Health Science Center's College of Pharmacy and Medicine). He maintains national certification as a clinical trial investigator through the Association of Clinical Research Professionals and is routinely invited to speak on the scientific, clinical and technical merits of clinical research. His research pursuits remain primarily in the conduct of over 60 clinical trials involving new and experimental antiviral medications in the field of antiretrovirals (anti-HIV medicines, but has also included influenza, hepatitis) and numerous other primary care conditions (i.e. diabetes, cholesterol, hypertension and COPD) with an emphasis on pharmacokinetic and pharmacodynamic assessments as well as mechanisms by which tolerability or optimization of outcomes can be achieved.</p>   |
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| <p><b>Xiaowei Dong, PhD</b><br/> Assistant Professor<br/> Pharmaceutical Sciences</p>                         | <p>My research has focused on drug delivery and formulation development. Cancer definitely is one of my research areas. Finding novel delivery systems to efficiently deliver anti-cancer drugs to tumors is the goal for this research. The research on overcoming multidrug resistance in cancer, which was the area of my Ph.D. research, continues in my current lab. In addition, I obtained great experience on drug product development and manufacture. The projects I had worked on covered the development stages from pre-clinical to clinical Phase III. Thus, my research interests also include translating pharmaceutical research into commercial products. In this aspect, novel oral solid dosage forms are specially interested. In-vitro cell study and in-vivo animal study are essential, and the studies of the underlying mechanisms about why and how the novel delivery systems enhance therapeutic outcomes are emphasized in my lab. Moreover, I am actively looking for the collaboration opportunities with the groups working on drug discovery to provide the support on formulation development of novel compounds. The ultimate goal of my research is to provide more medication options for patient benefits and make best contribution on healthcare improvement.</p> |
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**Dorette Z. Ellis, PhD**  
Associate Professor  
Pharmaceutical Sciences,  
North Texas Eye Institute



I am interested in understanding how aqueous humor is regulated in normal and the diseased state, glaucoma. Specifically, I study signal transduction and the regulation of ion transport (sodium and potassium) in physiological and pathological states. High intraocular pressure is a risk factor for glaucoma. Intraocular pressure is regulated by the rate of secretion of aqueous humor in the ciliary processes and the rate of exit of aqueous humor through the trabecular meshwork and Schlemm's canal. The role of the trabecular meshwork and Schlemm's canal in intraocular pressure regulation is unknown. Therefore the goals of my laboratory are to determine how aqueous humor production and outflow via the trabecular meshwork and Schlemm's canal are regulated. Additionally, we will identify the molecular and cellular mechanisms by which certain ocular hypotensives lower intraocular pressure. Identification of these target sites will allow for potential therapeutic strategies for the treatment of glaucoma and ocular hypertension. Another area of interest is retinal ganglion cell survival in glaucoma; specifically, the involvement of the sigma 1 receptor in neuroprotection and its modulation of ion transport (calcium) and mitochondrial function. The elucidation of mechanism (s) involved in retinal ganglion cell survival is of great importance, as this may lead to potential targets for therapeutic strategies for the treatment of glaucoma.

**Kyle A. Emmitte, PhD**  
Associate Professor  
Pharmaceutical Sciences,  
Pharmacology & Neuroscience



Dr. Emmitte's primary research interests include the design and optimization of biologically active small molecules to serve as *in vivo* probes and drug discovery leads. He has more than thirteen years of experience in the fields of medicinal chemistry and drug discovery, having previously held positions in the pharmaceutical industry and academia. Dr. Emmitte's recent research has primarily focused on the design and discovery of novel small molecule negative allosteric modulators (NAMs) of the metabotropic glutamate receptor (mGlu) family of receptors as novel approaches to the treatment of a variety of CNS disorders. Previously, he also worked on projects directed toward the design of novel ATP competitive kinase inhibitors for the treatment of cancer. Dr. Emmitte's research is collaborative by nature and engages the areas of medicinal chemistry, molecular pharmacology, *in vivo* biology, and DMPK. To date, he has authored over 45 peer-reviewed publications and is an inventor on 21 filed patent applications and has 11 issued U.S. patents.



**Jin Liu, PhD**  
Assistant Professor  
Pharmaceutical Sciences





I am interested in understanding protein allosteric mechanisms and developing new therapeutic strategies for cancer and neurological diseases using computational chemistry and computational biology approaches. Allostery, as the communication of distinct sites in proteins, is an intrinsic property of many proteins for cell signaling. Allosteric drug design, targeting sites other than active sites, emerges as a novel way to design drugs for a wide range of diseases, offering distinct advantages over conventional drugs, such as increased selectivity, self-limiting activity, and fewer side effects. However, the complication of allosteric mechanism and the lack of strategies to identify allosteric sites remain big challenges to design allosteric drugs. Recently, I have developed novel computational methods to successfully identify allosteric sites, and forged collaborations with cancer biologists to develop allosteric drugs. My current and future research interests include developing allosteric drugs for cancer and neurological disorders, exploring mechanisms of neurotransmitter release machinery, and constructing novel 3D allosteric network for next-generation drug design.

**Iok-Hou Pang, Ph.D.**  
Professor and Chair  
Pharmaceutical Sciences,  
North Texas Eye Institute



Dr. Pang has considerable experience in glaucoma research and ocular pharmacology. He has been involved in glaucoma drug discovery since 1990, and dedicated in evaluation and discovery of new potential therapeutic targets and agents for the disease. His current research interests mainly focus on the understanding of glaucoma etiology, pathology, and pharmacology, especially on glaucoma neuroprotection. He is working to delineate essential molecular and cellular mechanisms, as well as characterize receptors and signal transduction pathways related to the abnormal changes in glaucoma. His laboratory is using rodents and primary cultures of retinal cells, neurons as well as glia, as study models to clarify biological events leading to glaucomatous optic neuropathy and retinopathy as well as its prevention and protection. He has edited one book, coauthored more than 90 peer-reviewed publications and book chapters. He is a member of numerous professional organizations, including the American Association of Pharmaceutical Scientists, Association for Research in Vision and Ophthalmology, International Society for Eye Research, and Society for Neuroscience. He has served on editorial boards and as reviewer for many journals. He is an inventor in 18 issued US & international patents and numerous pending patents.

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| <p><b>Katalin Prokai-Tatrai, PhD</b><br/>Associate Professor<br/>Pharmaceutical Sciences,<br/>Pharmacology &amp; Neuroscience</p> | <p>My research interests have focused on innovative and multidisciplinary research projects involving medicinal chemistry-driven drug discovery, drug design and drug delivery into the central nervous system (CNS). These projects also encompass pharmacokinetics, metabolism and drug distribution studies to develop neuroactive/neuroprotective agents. We not only design and synthesize complex organic and peptide-based (pro)drug leads using <i>in silico</i> predictions of physicochemical parameters, but also carry out broad preclinical assessments through <i>in vitro</i> and <i>in vivo</i> methods involving biopharmaceutical analyses and various neurochemical/pharmacological paradigms useful to evaluate the extent of CNS drug delivery. I have over eighty publications in the broad areas of medicinal, organic and analytical chemistry, drug delivery, pharmaceutical analyses and mass spectrometry-based proteomics. I was an editor and contributor to a highly successful book in the prestigious <i>Progress in Drug Research</i> series entitled "Peptide Transport and Delivery Into the Central Nervous System" and also an editor of a special issue on neuroprotection in 2009 in <i>International Journal of Molecular Sciences</i>.</p> |
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| <p><b>Yu-Chieh (Jack) Wang, PhD</b><br/>Assistant Professor<br/>Pharmaceutical Sciences,<br/>Molecular &amp; Medical Genetics</p> | <p>Dr. Wang's primary research interest includes stem cell and cancer biology aiming to understand the molecular basis for cellular pluripotency and malignancy, and to develop better therapeutic strategies for managing human diseases. The long-term goals of Dr. Wang's research are 1) to discover novel targets for manipulating cellular pluripotency in human pluripotent stem cells (e.g., iPSCs or ESCs) for regenerative medicine and other biomedical purposes, 2) to identify and functionally analyze novel biomarkers and therapeutic targets for better managing human cancer disease. Dr. Wang is a member of several professional societies including the American Association for Cancer Research (AACR), American Society of Clinical Oncology (ASCO), American Chemical Society (ACS), Society for Glycobiology (SFG), and International Society for Stem Cell Research (ISSCR). Also, he has served as an advisory board member of the GTC Stem Cell Summits and been invited as a speaker in the panel discussion on Selecting a Mentor sponsored by Elsevier B.V., the ISSCR annual meeting, the GTC Stem Cell Summit, and special seminars for several academic institutions.</p>   |
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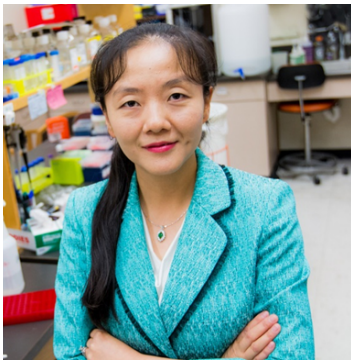


**Annesha White, PharmD, PhD**  
Assistant Professor and Assistant  
Dean for Assessment  
Pharmacotherapy



Dr. White's primary research interests include the design of studies to address issues in the health services research arena. Areas of focus include Medicare, Managed Care, Pharmacoeconomics, Comparative Effectiveness and Outcomes Research. Her research over the years has included a focus on a variety of disease states, such as heart disease, asthma, hypertension, and diabetes with the goal of providing care that is balanced in quality and cost. Dr. White's recent research has focused on accountable care organizations and health system mergers to improve patient care coordination. She also works on projects to improve care for chronic kidney disease patients, specifically targeting novel therapies to treat hyperphosphatemia. Dr. White's research involves a team approach to care examining the various aspects of the health care system and how entities can join together to enhance efforts. She has published several peer-reviewed articles, a textbook entitled Introduction to the Pharmacy Profession and serves as a referee for journals such as Medical Care and the Journal of Managed Care Pharmacy.

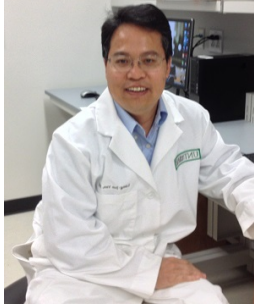
**Hongli Wu, PhD**  
Assistant Professor  
Pharmaceutical Sciences,  
Pharmacology & Neuroscience



The central theme of my research is to understand the role of protein repair enzymes and evaluate their therapeutic potentials for the treatment of eye diseases and cancer. Of primary interest is the age-related macular degeneration (AMD), the most common retinal disorder that affects 25 million people worldwide, yet its pathogenesis remains poorly understood. My lab uses gene knockout and transgenic animals, and primary retinal cells as models to elucidate how altered redox signaling and disrupted redox homeostasis contribute to the pathogenesis of AMD. My research emphasizes the effects of oxidative damage and its repair on retinal proteins, in particular the thiol (SH)-containing proteins/enzymes. We also identify new therapeutic agents from natural products for AMD treatment and cancer prevention.

**Liang-Jun Yan, PhD**

Associate Professor  
Pharmaceutical Sciences,  
Pharmacology & Neuroscience



We investigate the roles of mitochondrial protein oxidation and posttranslational modifications in aging and aging-related diseases. We are particularly interested in mitochondrial protein oxidation and modifications that play beneficial roles in age-associated chronic diseases. Our current projects, utilizing mouse or rat as animal models, focus on two mitochondrial enzymes: dihydrolipoamide dehydrogenase (DLDH) in stroke protection and NADH-ubiquinone oxidoreductase (complex I) in diabetic pathogenesis. Both enzymes use  $\text{NAD}^+$  as their cofactor which serves as an essential molecule in cellular redox sensing, stress response, energy metabolism, and mitochondrial function.

### **3. ACADEMIC POLICIES**

#### **DEGREE REQUIREMENTS**

The degree requirements are determined by the graduate catalog currently in force at the time the student's degree plan is approved by the GSBS Office of Admissions and Services.

##### ***Master of Science (MS) Degree***

The candidate for an MS degree must earn 30 or more semester credit hours (SCH), depending upon the specific degree requirements. These degree requirements are determined by the graduate catalog currently in force at the time the student's degree plan is approved by the graduate dean. For the traditional MS degree, 17-20 SCH of the total 30 consist of core requirements and thesis. The use of special problems courses is limited to a maximum of 6 SCH.

The degree is awarded to:

1. A student who chooses to obtain an MS degree, or
2. A PhD student who does not fulfill the requirements for a PhD and elects to pursue an MS degree.

##### ***Doctor of Philosophy (PhD) Degree***

The candidate for a PhD degree must earn 60 SCH beyond the MS degree or 90 SCH beyond the bachelor's degree. Doctoral students who have earned an MS degree in a relevant field from an accredited university will be awarded up to 30 SCH of advanced standing, requiring 60 SCH of course work to complete the PhD.

#### **ENROLLMENT REQUIREMENTS**

To be considered full-time in a long semester, MS students must enroll in 9 SCH while PhD students must enroll in 12 SCH. Enrollment in a total of 6 SCH is considered full-time for the summer.

PhD students who have advanced to candidacy are required to enroll in a minimum of 9 SCH each long semester and 6 SCH each summer semester.

Students (MS and PhD) enrolled prior to Summer 2011 must enroll in a minimum of 6 SCH each semester after advancing to candidacy.

Graduate students may schedule as many as 16 SCH during any long semester or 7 SCH in a summer semester.

##### ***Leave of absence***

If a situation arises where a student must set aside his/her graduate studies for a period of time, a leave of absence (LOA) may be requested. LOA may be requested for up to three

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semesters. If additional leave is needed, a new form must be submitted. The maximum amount of LOA is six semesters (two academic years). A student on LOA cannot receive funding as a graduate student. LOA status may affect student loans. Graduate advisors will be notified of any change to the LOA.

The student initiates the request by obtaining the LOA form from the Office of the Registrar and returning the completed form to the Office of the Registrar.

Toward the end of a period of approved LOA, the student must take steps to resume studies at the beginning of the next semester, extend the LOA, or withdraw from the GSBS. To resume studies, the student obtains approval from the major professor and graduate advisor and registers for classes. To extend the LOA, the student completes and submits a new LOA Request. To withdraw from school, the student follows the normal procedures for withdrawal, including completion of the clearance process.

### ***Temporary leave of absence***

Students are required to notify their account holder (if funded), major professor, and graduate advisor if they will be away from campus for more than five consecutive days by completing the Temporary Leave of Absence (TLA) form. The account holder reserves the right to withhold funding during the time of separation. Typically, a student will be placed on funding hiatus if he/she is away from campus for more than two weeks.

## **TRANSFER INTO A NEW GRADUATE PROGRAM**

### ***First year students***

An MS or PhD student in good academic standing (i.e., not on academic probation) and has successfully completed the CORE courses may seek to transfer into the Pharmaceutical Sciences & Pharmacotherapy Graduate Program. Student must first discuss the potential transfer with the Graduate Advisor of Pharmaceutical Sciences & Pharmacotherapy and has identified a mentor willing to accept the prospective student. A student who does elect to transfer to the Department of Pharmaceutical Sciences or the Department of Pharmacotherapy must submit a signed copy of the "Change of Discipline" form (available on the UNTHSC website: <http://www.hsc.unt.edu/education/gsbs/forms.cfm>). The student will be considered for admission for the following semester upon review of their original application to the Graduate School, along with any additional information (e.g., updated letters of recommendation, updated c.v., etc.) if needed. This policy applies to full-time students only.

### ***Non-first year students***

An MS or PhD student in good academic standing (i.e., not on academic probation) and has successfully completed the CORE courses may seek to transfer into the Pharmaceutical Sciences & Pharmacotherapy Graduate Program. Student must first discuss the potential transfer with the Graduate Advisor of Pharmaceutical Sciences & Pharmacotherapy and has identified a mentor willing to accept the prospective student. A

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student who does elect to transfer to the Department of Pharmaceutical Sciences or the Department of Pharmacotherapy must submit a signed copy of the "Change of Discipline" form (available on the UNTHSC website: <http://www.hsc.unt.edu/education/gsbs/forms.cfm>). This policy applies to full-time students only.

## **GRADING SYSTEM**

Graduate students must maintain an overall 3.0 GPA. The student whose GPA earned at another institution is below 3.0 will be required to make up the deficiency either at the other institution or at UNTHSC. This regulation applies not only to graduate work attempted elsewhere before the student was first admitted to GSBS, but also to graduate work attempted elsewhere after the student's admission at the UNTHSC.

Students must make satisfactory progress toward completion of degree requirements in order to remain in good standing within a specific degree program. Students whose progress is unsatisfactory may be removed from the program by the graduate dean on recommendation of the student's discipline.

Each student's semester grades and semester GPA will be reviewed at the completion of every semester. To remain in good academic standing, an overall GPA of 3.0 or better must be maintained. The student who does not maintain the GPA will be placed on probation and have one long semester to correct the deficient GPA. Failure to do so may result in dismissal from the GSBS. Dismissals may be appealed in writing to the GSBS dean within five working days of notification of dismissal. Students involved in an appeal continue to attend class and sit for examinations until final conclusion of the process.

Students receiving state-supported assistantships will remain on assistantship during the semester the student is attempting to correct the deficient GPA, unless otherwise specified by the dean.

A student earning an "F" in any graduate level course will be dismissed from the GSBS. Dismissals may be appealed in writing to the graduate dean within five working days of notification of dismissal. Students involved in an appeal continue to attend class and sit for examinations until final conclusion of the process. If the student is allowed to continue in graduate school, his/her program discipline may have additional requirements/stipulations for continuation in the discipline. The course in which the student achieved an "F" grade must be repeated. No student may graduate with an unresolved "F" on his/her record.

### **Grades**

For either the MS or PhD program, it is required that a **student maintain a minimum grade average of B**. However, each student must make a grade of at least B in all Pharmaceutical Sciences & Pharmacotherapy courses.

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## **RESEARCH**

The MS degree may require the student's research to be written and submitted for publication. The PhD degree will require demonstrated research productivity and originality. Since research is a major part of the degree requirement for both the MS and PhD degree, **it will be expected that the student spend a MINIMUM of 40 hours per week at the UNTHSC campus.** Prior to the time the student chooses a research topic, this research time may be spent in the laboratory of one of the UNTHSC faculty as part of a special problems course. Early and continuous involvement in research is a top priority of graduate education. Students will acquire their most important skills during this time, including skills in independent and critical thinking, grant and manuscript writing, use of computer software applications, and research techniques. These skills will largely determine the future success of a student in obtaining a position in academia or industry or other career paths.

### ***Selection of an advisory committee***

Students enter the graduate program with a major professor/mentor. The major professor will have the primary responsibility for directing the student's research.

The major professor and/or the graduate advisor assist the student in selecting members to serve on the advisory committee. The committee guides the student in selecting course work appropriate for the degree program, defines research goals, monitors research progress, approves the research proposal, and provides scientific guidance. The advisory committee administers the final examination for the degree. For PhD students only, the advisory committee administers the Grant Writing (BMSC 6310) examination. The major professor may attend but cannot participate or vote in the Grant Writing proceedings.

**The major professor serves as chair of the advisory committee. Each student is required to meet with his/her advisory committee at least once per academic year.**

*For MS degree* - Advisory committees must include at least two additional UNTHSC graduate faculty members.

*For PhD degree* - Advisory committees must include at least three additional UNTHSC graduate faculty members.

All students in programs requiring thesis will be assigned a university member (see details below) who ensures that the policies and procedures of the GSBS and UNTHSC are upheld.

### ***University Member***

When the advisory committee is formed, the dean will appoint a university member.

The primary responsibility of the university member on both MS and PhD committees is to ensure that the policies, procedures and standards of the GSBS and UNTHSC have been upheld. The university member may choose to participate but must be present in any formal hearing (see below for list of such events); however, such participation is not

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mandated by the GSBS. The university member's signature on appropriate forms indicates that the integrity of the review process has been preserved. It is the responsibility of the university member to report to the dean any inappropriate due process.

The university member must be present at all formal hearings that require a vote which include the oral qualifying examination; the public seminar and private defense associated with Grant Writing (BMSC 6310); the dissertational proposal presentation and defense; and the final dissertation seminar and defense.

## **ADVANCEMENT TO CANDIDACY**

### ***PhD Oral Comprehensive Examination***

A student in the PhD program needs to successfully defend his/her general knowledge of pharmaceutical sciences and pharmacotherapy in an oral defense before a graduate program comprehensive *examination committee (3-5 members) and a University member*. The graduate advisor will chair these examinations. The committee will be appointed by the department chair and graduate advisor.

The student's major professor may not serve on the examination committee, but may, at the request of the student, be present for the examination as a silent observer.

This examination will be held at the beginning of the Fall semester in Year 2 (September).

The student will be given a series of questions covering topics from Core and Required Advanced Courses. The student will be given 30 min preparation time, at the end of which the committee will enter the room. The student will answer the questions he/she picked, and answer any questions arising from the committee.

Successful completion of this requirement will be determined by the oral comprehensive examination committee. If unsuccessful on the first attempt, a student may be allowed to retake the examination. The second examination should be completed within twelve weeks of the original examination, unless otherwise specified by the examination committee. If unsuccessful on the second attempt, students will be required to transfer to the M.S. degree program.

### ***Masters/Doctoral Research Proposal***

Each student will be required to submit a research (dissertation/thesis) proposal to his/her advisory committee. The student and his/her mentor will decide upon the format of the research proposal (traditional proposal with no page limits or NIH style grant including all its limitations (F31, R21)).

Traditional proposal format is as follow: Abstract (1 pg), Specific Aims (1 pg), Background and Pilot Studies (3-5 pgs), Experimental Design and Methods including an anticipated results section (4-5 pgs), References (unlimited).

NIH-style grant format: refer to NIH website for all forms necessary.

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The student will set a meeting with his mentor and advisory committee including the university member to present and defend the proposal. The student's advisory committee will determine if the proposal is satisfactory.

For PhD students, the proposal should be completed within a year of having passed their oral examination. The proposal must be approved by the student's advisory committee and submitted to the Graduate School, at the latest, during the semester prior to the student's final semester.

**The research proposal should be provided to the advisory committee no later than 10 days prior to the defense.**

PhD students who have advanced to candidacy are required to enroll in a minimum of 9 SCH each long semester and 6 SCH each summer semester.

## **GRADUATION**

It is the responsibility of the student to stay abreast of progress toward the degree and to file the appropriate degree application in the GSBS Office of Admissions and Services. Consult the [GSBS Academic Calendar](#) for the deadlines. The student's final cumulative grade point average must be at least a 3.0 to qualify for graduation.

Information concerning graduation fees is contained in the Tuition and Fee Register. Students anticipating graduation should consult the [GSBS Academic Calendar](#) for final dates for payment of fees and meeting other graduation requirements. All fines, fees, etc. must be cleared before the diploma will be issued. All necessary forms and instructions are available on the [GSBS Graduation website](#).

Commencement exercises are held each year in May; however, degrees are conferred at the end of each semester. All information related to commencement exercises is available from the Office of the Registrar. Diplomas may be obtained from the Office of the Registrar after verification is received from the GSBS that all requirements for the degree have been satisfied.

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## OTHER PROGRAM REQUIREMENTS

### *Seminars*

All MS and PhD students in the Graduate Program of Pharmaceutical Sciences & Pharmacotherapy are required to attend departmental seminars in their entirety (whether they are taking the associated course for credit or not) and to meet with invited seminar speakers when assigned.

### *Journal Clubs*

MS students in the Graduate Program of Pharmaceutical Sciences & Pharmacotherapy are required to attend all journal clubs until they graduate.

PhD students in the Graduate Program of Pharmaceutical Sciences & Pharmacotherapy are required to attend journal clubs for 3 long semesters (Fall year 1, and Fall/Spring year 2).

Students are required to take PSPT 6400 (Principles of Drug Discovery and Development) for course credit once.

### *Work in Progress*

All students in the Graduate Program of Pharmaceutical Sciences & Pharmacotherapy are required to attend all work in progress sessions once they join the program. All students will be required to present their work starting in year 2.

### *Publications and Thesis Requirements*

It is normally required that the PhD candidate be **first author on a minimum of one peer-reviewed research papers** (published or in press) prior to his/her being awarded the terminal degree. (This requirement applies to all students in the PhD program, regardless of the degree held upon entrance into the program).

A student may use these manuscripts as chapters in his/her doctoral thesis in accordance with the requirements of the Graduate School. Alternatively, a student who, in the judgment of the advisory committee, was not the primary author of the submitted papers on his/her research will be required to write a traditional dissertation.

**The thesis or dissertation should be provided to the advisory committee no later than 10 days prior to the defense.**

### *Milestones*

Refer to checklist at the end of the handbook for the timeline for achievements of the milestones for MS and PhD program degrees.

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## 4. DEGREE PROGRAMS

The following are typical degree plans for students pursuing MS or PhD degrees.

### ***MASTER OF SCIENCE (MS) DEGREE***

#### **YEAR 1**

##### **FALL**

**SCH**

|   |                    |
|---|--------------------|
| BMSC 6201 Fundamentals of BMSC1                 | 2                  |
| BMSC 6202 Fundamentals of BMSC2                 | 2                  |
| BMSC 6203 Fundamentals of BMSC3                 | 2                  |
| BMSC 6204 Fundamentals of BMSC4                 | 2                  |
| BMSC 5150 Lab Rotations                         | 1                  |
| BMSC 5150 Lab Rotations                         | 1                  |
| BMSC 6200 Experimental Design and Biostatistics | 2                  |
|   | <b>12 (12 SCH)</b> |

##### **SPRING**

|  |                         |
|--|-------------------------|
| BMSC 5160 Biomedical Ethics  | 1                       |
| BMSC 5315 Principles of Scientific Communications                      | 2                       |
| BMSC 5998 Individual Research  | 1-4                     |
| PSPT 6400 Principles of Drug Discovery and Development                 | 4                       |
| PSPT 6100 Independent Topics in Pharmaceutical Sciences (Journal Club) | 1                       |
|  | <b>9-12 (21-24 SCH)</b> |

##### **SUMMER**

|   |                      |
|---|----------------------|
| BMSC 6100 Scientific Communication Competencies | 1                    |
| BMSC 5998 Individual Research                   | 1-5                  |
| Advanced Courses                                | 0-4                  |
|   | <b>6 (27-30 SCH)</b> |

#### **YEAR 2**

##### **FALL**

|                  |                      |
|------------------|----------------------|
| BMSC 5385 Thesis | 1-9                  |
| Advanced Courses | 0-8                  |
|                  | <b>9 (36-39 SCH)</b> |

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## **DOCTOR OF PHILOSOPHY (PhD) DEGREE**

### **YEAR 1**

#### FALL

|   | <b>SCH</b>         |
|---|--------------------|
| BMSC 6201 Fundamentals of BMSC1                 | 2                  |
| BMSC 6202 Fundamentals of BMSC2                 | 2                  |
| BMSC 6203 Fundamentals of BMSC3                 | 2                  |
| BMSC 6204 Fundamentals of BMSC4                 | 2                  |
| BMSC 5150 Lab Rotations                         | 1                  |
| BMSC 5150 Lab Rotations                         | 1                  |
| BMSC 6200 Experimental Design and Biostatistics | 2                  |
|   | <b>12 (12 SCH)</b> |

#### SPRING

|  |                    |
|--|--------------------|
| BMSC 5160 Biomedical Ethics  | 1                  |
| BMSC 5315 Principles of Scientific Communications                      | 2                  |
| BMSC 5998 Individual Research  | 4                  |
| PSPT 6400 Principles of Drug Discovery and Development                 | 4                  |
| PSPT 6100 Independent Topics in Pharmaceutical Sciences (Journal Club) | 1                  |
|  | <b>12 (24 SCH)</b> |

#### SUMMER

|   |                   |
|---|-------------------|
| BMSC 6100 Scientific Communication Competencies | 1                 |
| BMSC 6998 Individual Research                   | 1-5               |
| Advanced Courses                                | 0-4               |
|   | <b>6 (30 SCH)</b> |

### **YEAR 2**

#### FALL

|                               |                    |
|-------------------------------|--------------------|
| BMSC 6998 Individual Research | 4-10               |
| Elective courses              | 1-4                |
| Other advanced Courses        | 1-4                |
|                               | <b>12 (42 SCH)</b> |

#### SPRING

|                               |                    |
|-------------------------------|--------------------|
| BMSC 6998 Individual Research | 1-12               |
| Advanced Courses              | 0-11               |
|                               | <b>12 (54 SCH)</b> |

#### SUMMER

|   |                   |
|---|-------------------|
| BMSC 6100 Scientific Communication Competencies | 1                 |
| BMSC 6998 Individual Research                   | 0-5               |
| Advanced Courses                                | 0-5               |
|   | <b>6 (60 SCH)</b> |

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### YEAR 3

#### FALL

|                                 |                   |
|---------------------------------|-------------------|
| BMSC 6395 Doctoral Dissertation | 1-9               |
| Advanced Courses                | 0-8               |
|                                 | <b>9 (69 SCH)</b> |

#### SPRING

|                                 |                   |
|---------------------------------|-------------------|
| BMSC 6395 Doctoral Dissertation | 9                 |
|                                 | <b>9 (78 SCH)</b> |

#### SUMMER

|   |                   |
|---|-------------------|
| BMSC 6100 Scientific Communication Competencies | 1                 |
| BMSC 6395 Doctoral Dissertation                 | 5                 |
|   | <b>6 (84 SCH)</b> |

### YEAR 4

#### FALL

|                                 |                   |
|---------------------------------|-------------------|
| BMSC 6395 Doctoral Dissertation | 9                 |
|                                 | <b>9 (93 SCH)</b> |

Notes:

Shaded text indicates required courses for pharmaceutical sciences & pharmacotherapy students.

Elective courses must include 6-8 SCH of advanced courses in Pharmaceutical Sciences & Pharmacotherapy (excluding seminar/special problems). Elective courses in other disciplines can also be taken, provided that the required electives in Pharmaceutical Sciences & Pharmacotherapy are completed. The student is referred to the Graduate Catalog for course offerings in other departments.

Elective and advanced courses in Pharmaceutical Sciences & Pharmacotherapy (under development):

- PSPT 7375 Special Topics in Pharmacy Research (1-3 SCH) (can be re-taken)
- PSPT xxxx Advanced Drug Discovery and Development (new course TBD, 2 SCH)
- PSPT xxxx Stem Cells and Regenerative Medicine (new course TBD, 2 SCH)
- PSPT xxxx Computational Drug Design (new course TBD, 2 SCH)
- PSPT xxxx Advanced Pharmacokinetics (new course TBD, 2 SCH)
- PSPT xxxx Advanced Clinical Research Management (new course TBD, 2 SCH)
- PSPT xxxx ???? (new course TBD, 2 SCH)

## 5. CONTACTS IN SITUATIONS OF UNCERTAINTY OR EMERGENCY

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