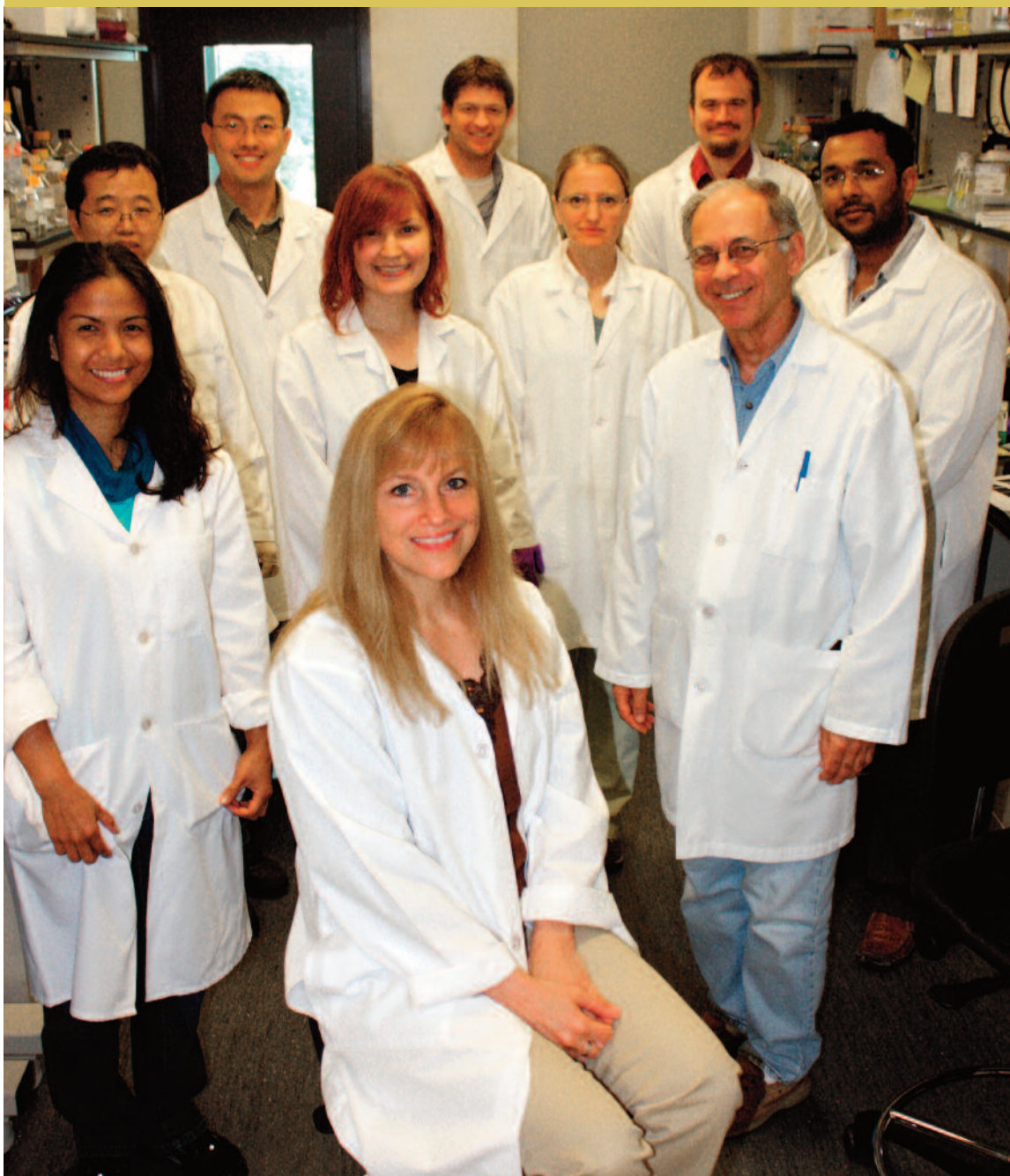




# COLLEGE of PHARMACY

THE UNIVERSITY OF TEXAS AT AUSTIN

## FACULTY RESEARCH INITIATIVES



WHAT STARTS HERE CHANGES THE WORLD

# COLLEGE *of* PHARMACY

## FACULTY RESEARCH INITIATIVES



**College of Pharmacy • The University of Texas at Austin**  
2409 University Avenue Stop A1900 • Austin, Texas 78712-1113  
[www.utexas.edu/pharmacy/research](http://www.utexas.edu/pharmacy/research)

# NEW CHALLENGES

## NEW PARTNERSHIPS

Thanks to the discoveries of earlier research scientists, many diseases that plagued our ancestors have been eradicated. We stand as the beneficiaries of these efforts. Yet today, other diseases and pathogens continue to threaten our health and well being. Discovery's journey is long and costly. To realize success, contemporary researchers rely upon financial collaborations with individuals and organizations that share a similar vision – a better world for us and for generations to come. I invite you to partner with us. Together, you and The University of Texas at Austin College of Pharmacy can turn dreams to reality and realize a healthier world for all of us. What starts here changes the world.



M. Lynn Crismon  
Dean

## NEW INITIATIVES

Thinking outside the box may be a cliché, but it's a process that has led to remarkable discoveries. From finding useful applications for bacteria to turning the resilient cold virus into an effective transport for drug therapies, innovative solutions often are found when viewing old problems in new light. Faculty researchers at The University of Texas at Austin College of Pharmacy stand outside the traditional realms tapping their own unique perspective to see opportunity in challenge and potential in problems. Whether their field is cancer, substance addiction, hypertension or Ebola, these scientists stand poised at the cutting edge of discoveries that will turn elusive answers into effective treatments. I invite you to read about their initiatives and to join them in their work that holds new promise.



Carlton K. Erickson  
Associate Dean  
for Research and  
Graduate Studies

## NEW STUDY TRACK FOR PHARMACY GRADUATE STUDENTS

Beginning in Fall 2014, students applying to the University of Texas doctoral program in pharmaceutical sciences will have an additional study track to consider. A new "Interdisciplinary Track" (in addition to existing tracks in Health Outcomes and Pharmacy Practice, Medicinal Chemistry, Pharmaceutics, Pharmacotherapy, and Pharmacology / Toxicology), will allow students to choose from a menu of courses across multiple tracks, and to develop a dissertation topic that would normally not be available within a traditional track discipline. Further, students will be able to concentrate their research within and across eight collaborative areas of research excellence in the college, including:

- chemical biology / drug discovery
- infectious disease
- neurobiology and development
- neuropharmacology / addiction
- oncology
- outcomes research
- toxicology and environmental disease
- translational research in drug delivery\*

\*Note this is not the same as the translation science doctoral program described at [http://iims.uthscsa.edu/ed\\_trans\\_sci\\_phd.html](http://iims.uthscsa.edu/ed_trans_sci_phd.html)

Thus, a student enrolling in the interdisciplinary track might, for example, study the pharmacoeconomics of new drug development with co-supervising professors from the health outcomes and pharmaceutics tracks. Other projects might include the study of the relationships between drug addiction and cancer development, environmental factors in fetal brain development, or unique methods of drug delivery in specially-designed new medicinal products. These are only a few of a multitude of interdisciplinary topics that could be pursued by curious students with vision. Students interested in this new study track, should indicate interest on the graduate application.

## HEALTH OUTCOMES AND PHARMACY PRACTICE DIVISION

### Jamie C. Barner, Ph.D.

- Examining the impact of pharmacy services (primarily medication therapy management services) on patient outcomes
- Understanding factors that affect health care utilization and outcomes



### Marvin Shepherd, Ph.D.

- Importation of pharmaceuticals
- Pharmaceutical marketing
- Managed care pharmacy
- Economics of pharmacy services
- Pharmacoeconomics
- Counterfeit medications and prescription drug diversion and theft



### Carolyn Brown, Ph.D.

- Cultural and social elements that impact both quality of care and outcomes in diverse populations
- Patient decision-making related to medication adherence and use of complementary and alternative medicine



### James Wilson, Ph.D.

- Pharmacoepidemiology
- Pharmacoeconomics
- Management of clinical programs



### Kentya H. Ford, Dr.PH, M.S. CHES

- Health education and promotion
- Tobacco use prevention and cessation
  - The predictors of smoking and other forms of tobacco use targeting adolescent and young adult populations
  - The treatment of tobacco use and addiction through addressing the clinician's role in cessation
- Health disparities



### Kenneth Lawson, Ph.D.

- Economics of pharmacy and other health care services
- Health care systems



### Debra Lopez, Pharm.D., CDE

- Pharmacist interventions
- Chronic disease states such as diabetes, hypertension and dyslipidemia



### Karen Rascati, Ph.D.

- Economics of pharmacy services
- Outcomes evaluation for disease states
- Pharmacoeconomics



## SELECTED GRADUATE STUDENTS

### Abiola O. Oladapo - Dr. Jamie Barner

B.S., Pharmacy, Obafemi Awolowo University, Osun State, Nigeria

Research interest: Patients' medication use patterns across a variety of chronic disease conditions using large medical and prescription claims databases

- Recipient, 2013, William S. Livingston Outstanding Graduate Student Academic Employee Award, Graduate Research Assistant
- Recipient, 2012, William C. Powers Graduate Fellowship
- Recipient, 2009, Texas Excellence Teaching Award

### Pooja Desai - Dr. Kenneth Lawson

Bachelor of Technology in Pharmaceutical Sciences and Technology, Institute of Chemical Technology, Mumbai, India

Research interest: Healthcare services utilization and expenditures, and medication use patterns associated with psychiatric disorders, diabetes, and other conditions using Medicaid databases and national health services survey data

- Recipient, 2013, University of Texas Continuing Fellowship
- Recipient, 2012, Shering-Plough Research Institute Graduate Fellowship
- Recipient, 2011, Max and Mary Anne Burlage Fellowship

### Dawn Kim-Romo - Dr. Karen Rascati

Pharm.D., University of Texas at Austin

Research interest: Medication therapy for patients with unipolar major depression with psychotic features in relation to improved safety, medication adherence and persistence, and reduced suicide attempts, health care utilization, and health care costs using Texas Medicaid data

- Recipient, 2013, PhRMA Foundation Health Outcomes Pre-Doctoral fellowship
- Recipient, 2011, ISPOR Best Student Power

## MEDICINAL CHEMISTRY DIVISION

### Kevin Dalby, Ph.D.

- Chemistry – anticancer drug development
- Biochemistry – mechanisms of regulation of signaling enzymes
- Cell biology – signaling pathways that promote cancer



### Walter Fast, Ph.D.

- Enzyme mechanisms, anticancer and antibiotic drug discovery
- Enzymes that regulate nitric oxide production
- Enzymes that block bacterial quorum sensing
- Enzymes that promote antibacterial resistance



### Sean Kerwin, Ph.D.

- Design and synthesis of DNA- and protein-binding agents and molecular probes
- Synthetic and mechanistic studies of alkyne cyclization reactions
- Natural product synthesis and biological studies
- Anticancer drug discovery



### Seongmin Lee, Ph.D.

- Molecular mechanisms underlying genome/epigenome management
- Design and development of novel epigenetic chemotherapeutics



### Hung-wen (Ben) Liu, Ph.D.

- Mechanistic studies of novel enzyme reactions
- Biosynthesis of natural products
- Metabolic pathway engineering
- Design and synthesis of enzyme inhibitors
- Studies of ADP-ribosylation of proteins



### Christian Whitman, Ph.D.

- Evolution of enzymes and enzymatic activities
- Biosynthesis of pyrrolo[1,4] benzodiazepine natural products



### SELECTED GRADUATE STUDENTS

#### Jamison Huddleston - Dr. Chris Whitman

B.S., Biochemistry, The University of Texas at Austin

Research interest: Assigning functions to enzymes for identification of new drug targets

#### Anthony Romo - Dr. Ben Liu

Pharm.D., The University of Texas at Austin

Research interest: Microbial biosynthesis of small molecules that can be used as antibiotics

#### Alesha Stewart - Dr. Walter Fast

B.S., Denison University

Research interest: Mechanism and inhibition of an emerging antibiotic resistant determinant named the new Delhi metallo-beta-lactamase-1.

## PHARMACEUTICS DIVISION

### Maria Croyle, Ph.D.

- Development of novel synthetic methods to hide/mask recombinant viral vectors from the immune system
- Investigation of host-pathogen interactions and their role in hepatic and renal drug metabolism
- Development of large-scale production methods for clinical use of viral vectors for immunization and genetic therapies
- Development of formulations and novel dosage forms that enhance the physical stability of viral vectors
- In Vitro/In Vivo testing of novel formulations/delivery methods to enhance gene expression
- Development of designer synthetic vaccines against dangerous pathogens
- Evaluation of the impact of common dietary supplements on the innate immune response against microbial pathogens



### Zhengrong (Rong) Cui, Ph.D.

- Anticancer drug delivery and targeting
- Nanotechnology to overcome tumor chemoresistance
- Microneedle-mediated transcutaneous immunization against infectious disease
- Development of nanoparticle platforms for vaccine delivery
- Cancer gene therapy



### James McGinity, Ph.D.

- Physical and chemical properties of drugs and other adjuvants used in pharmaceutical dosage forms
- Controlled release technologies
- Polymeric drug delivery systems



### Hugh Smyth, Ph.D.

- Pulmonary drug delivery
- Biomedical devices
- Nanoparticle drug delivery
- Lung cancer, cystic fibrosis, asthma, COPD, RNAi
- Drug delivery in infectious disease, biofilms



### Salomon A. Stavchansky, Ph.D.

- Principles of biopharmaceutics, pharmacokinetics and drug metabolism to evaluate and design drug delivery systems to ensure safety and efficacy of drug products
- Bioequivalence of generic drug products and biosimilars
- Bioequivalence of highly variable drugs and complex drug products
- Delivery of drugs through nanostructures platforms
- Permeability, solubility and molecular descriptors to predict drug absorption
- Reduction of ischemia/reperfusion injury by caffeic acid phenethyl amide derivatives
- Implication of heme oxygenase-1 and transcriptional changes



### Janet C. Walkow, Ph.D.

- Drug development
- Preclinical studies
- Good Laboratory Practices (GLP)
- Bioscience education tools
- Wet lab incubators



### Alan Watts, Ph.D.

- Pediatric respiratory drug delivery
- Aerosols for delivery of biologic and combination products
- Models and formulations for preclinical drug development
- Particle engineering for improved drug delivery



## Robert O. Williams III, Ph.D.



- Formulation, development, optimization and delivery of small organic compounds, peptides and proteins by a variety of routes of administration including depot drug delivery, oral drug delivery (e.g., immediate and modified release) and pulmonary/nasal drug delivery
- Nanoparticle technology for inhalation, oral and parenteral drug delivery
- Physicochemical characterization of inactive and active ingredients
- Thermal processing related to development of pharmaceutical delivery systems
- Amorphous, crystalline and co-crystal to modify pharmacokinetic and pharmacodynamic properties

### SELECTED GRADUATE STUDENTS

#### **Xinran Li - Dr. Rong Cui**

B.S., Pharmacy and Pharmaceutical Sciences,  
Shenyang Pharmaceutical University

- Recipient, 2013, University of Texas College of Pharmacy Fellowship

#### **Jin Huk Choi - Dr. Maria Croyle**

B.S., Animal Biosciences and Technology,  
Konkuk University, Seoul, South Korea  
M.S. in Biotechnology, Seoul National University

- Recipient, 2012, American Association of Pharmaceutical Scientists Graduate Student Research Award from Pfizer Global Research and Development



## PHARMACOLOGY/TOXICOLOGY DIVISION

### John DiGiovanni, Ph.D.

- Cancer development
- Identifying novel cancer targets, mechanisms and strategies for cancer prevention
- Gene-environmental interactions regarding cancer
- Obesity and cancer, particularly childhood cancers



### Michela Marinelli, Ph.D.

- Neurophysiological bases for drug addiction
- Functional anatomy of brain circuits, using electrophysiology and optogenetics
- Effect of stress, drugs, and age on dopamine neuron activity and its relationship to addiction



### Christine Duvauchelle, Ph.D.

- Behavioral and neurochemical approaches to the study of the brain's reward circuitry in relation to drug addiction
- Ultrasonic vocalization as a tool to assess motivational properties of drugs and associated environments
- Animal models of excessive alcohol intake



### Robert O. Messing, M.D.

- Disturbances in signal transduction that contribute to addiction, emotional disorders, and pain with the goal of identifying new treatments



### Rueben Gonzales, Ph.D.

- Neurochemical basis for ethanol drinking behavior
- Effects of ethanol on basic dopaminergic neuronal activity in vivo
- Involvement of dopamine and glutamate in ethanol self-administration behavior



### Edward Mills, Ph.D.

- Regulation of normal mitochondrial metabolism and metabolic physiology
- Signaling mechanisms linking mitochondrial dysfunction to age-related metabolic diseases
- Development of mitochondrially-targeted therapies for the prevention and treatment of obesity, type II diabetes, and cancer



### Andrea Gore, Ph.D.

- Neuroendocrine control of reproduction
- Role of the hypothalamus in sexual differentiation, reproductive development, and aging
- Estrogen actions in the aging female brain
- Environmental endocrine disruptor perturbation of neuroendocrine and reproductive function



### Richard Morrisett, Ph.D.

- Role of neurotransmitter systems and synaptic transmission in alterations that underlie a variety of neural functioning and pathologies
- Alcohol-related disorders
- Learning and memory
- Neuronal development
- Development of epilepsy



**Somshuvra Mukhopadhyay,  
M.B.B.S., Ph.D.**

- Cell biology of membrane trafficking and metal ion homeostasis in the context of both normal cellular physiology and human disease



**John Richburg, Ph.D.**

- Molecular and cellular mechanisms that initiate testicular germ cells to undergo apoptosis after injury by environmental or chemotherapeutic agents



**SELECTED GRADUATE STUDENTS**

**Sara Nowinski - Dr. Ted Mills**

B.A., Carleton College, Northfield, Minnesota

Research interest: Molecular signaling pathways linking cellular metabolism and cancer development; mechanisms behind metabolic alterations that confer cancer resistance

- Recipient, 2013-2014, Powers Graduate Fellowship, The University of Texas at Austin
- Recipient, 2011, Pre-Doctoral Fellowship in Pharmacology/Toxicology, Pharmaceutical Research and Manufacturers of America Foundation

**Bailey Kermath - Dr. Andrea Gore**

B.S., University of Wisconsin-Madison

Research interest: Regulation of the gonadotropin-releasing hormone neurons of the hypothalamus which drive reproductive function and their network of afferent inputs during natural reproductive aging as a model of menopause in women

- Recipient, 2011, Endocrine Society Trainee Day Award
- Recipient, 2011-2012, UT Austin Graduate Student Continuing Fellowship
- Recipient, 2010-2013, UT Austin Graduate Professional Development Award

**James Reno - Dr. Christine Duvauchelle**

B.A. in psychology, California State University San Marcos

Research interest: Study the emotional experience surrounding drug-seeking and taking behaviors in exploring earlier targets in the drug abstinence-relapse cycle. The end goal is finding more successful interventions be they medication or therapeutic

- Recipient, 2011-present, Alcohol Training Grant Funding, Waggoner Center, University of Texas at Austin

**Carla Van Den Berg, Pharm.D.**

- Growth factor signaling in breast cancer
- Intracellular kinases in breast cancer metastasis using mouse models
- Normal mouse mammary gland development
- Mouse models for anti-cancer drug development



**Karen Vasquez, Ph.D.**

- Mechanisms of genomic instability
- DNA damage and mechanisms of repair
- Role of DNA structure in human disease, focused on cancer-relevant chromosomal translocations
- Development of novel therapeutic strategies for treating cancer



**Casey Wright, Ph.D.**

- Inflammatory signaling pathways in cancers of the immune system with emphasis on the activity of the pleiotropic transcription factor nuclear factor- $\kappa$ B (NF- $\kappa$ B)
- Identification of the complex molecular mechanisms regulating the NF- $\kappa$ B signaling module, providing insights for the development of therapeutics to treat NF- $\kappa$ B-related disease
- Role of NF- $\kappa$ B in immune disease development and/or progression arising from environmental toxin exposure



## PHARMACOTHERAPY DIVISION

### **Christopher Frei, Pharm.D., M.S., BCPS**

- Clinical epidemiology
- Outcomes research
- Comparative-effectiveness research
- Drug safety
- Community-based research
- Infectious diseases



### **Fancis Lam, Pharm.D., FCCP**

- Ethnic and genetic differences in drug metabolism, response and susceptibility to biological disorders
- Mechanisms and clinical implications of drug-drug interactions
- Correlation of pharmacokinetics and pharmacodynamics in clinical pharmacology



### **Jim Koeller, M.S.**

- Outcomes research
- Pharmacoeconomics
- Cancer care economics
- Cancer pathway development and economic assessment
- Cancer outcome measures and economics assessment
- Genomic outcomes and economic assessment



### **Robert Talbert, Pharm.D.**

- Clinical trial research in stroke prevention
- Application of nanoparticle technology to improve the absorption of poorly water soluble drugs for a variety of conditions



### **John G. Kuhn, R.Ph., Pharm.D., FCCP, BCOP**

- Oncology drug development
- Cancer Pharmacogenomics Research (CPR)
- Pharmacokinetics/  
Pharmacodynamics of anti-cancer agents



## SELECTED GRADUATE STUDENTS

### **Eugene Kreys, Pharm.D. - Prof. Jim Koeller**

Pharm.D. - University of Michigan College of Pharmacy

PGY1: Hospital of the University of Pennsylvania

- Recipient, 2013, University of Texas College of Pharmacy Scholarship

### **Grace C. Lee, Pharm.D., BCPS - Dr. Chris Frei**

Pharm.D. - Thomas J. Long School of Pharmacy and Health Sciences,

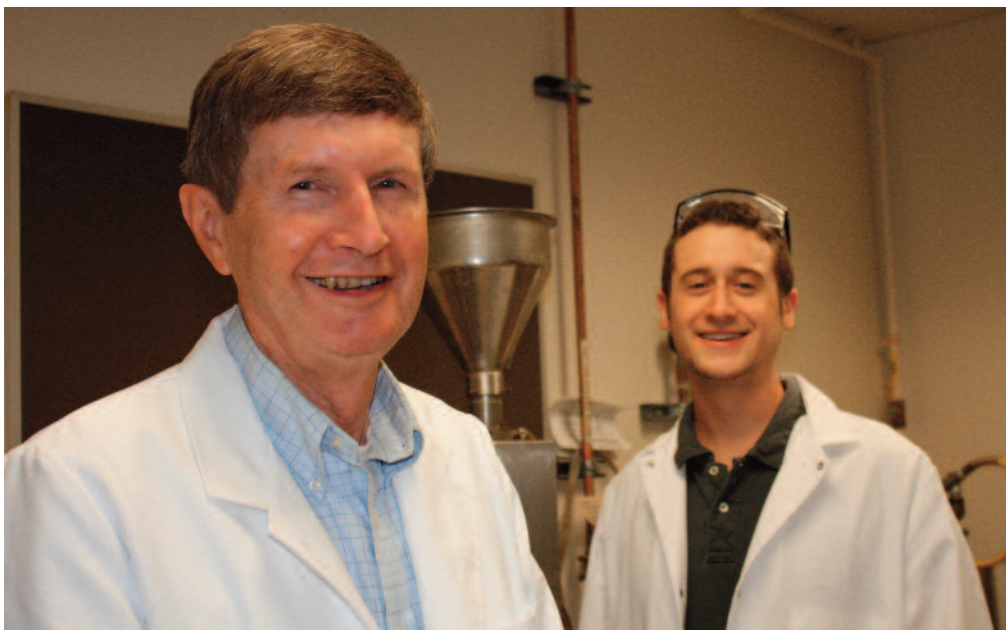
University of the Pacific - 2006

- Recipient, 2013, Pre-Doctoral Fellowship, American Foundation for Pharmaceutical Education
- Recipient, 2013, Best Student Poster Research Presentation, International Society for Pharmacoeconomics and Outcomes Research
- Recipient, 2012-2014, Johnson & Johnson Endowed Graduate Fellowship in Pharmacy
- Recipient, 2012, Co-Investigator, Research Grant, University of North Texas Health Science Center

### **Kelly Daniels, Pharm.D., BCPS - Dr. Chris Frei**

Pharm.D. - University of Texas at Austin - 2010

- Recipient, 2012-2014, Loan Repayment Award, Clinical Research, National Institutes of Health/National Center for Advancing Translational Sciences
- Recipient, 2013, Robert J. Willis Endowed Graduate Fellowship in Pharmacy; UT Austin
- University Continuing Fellowship, UT Austin
- Recipient, 2013, Best Student Poster Award, International Society for Pharmacoeconomics and Outcomes Research, Annual Meeting, New Orleans, LA
- Recipient, 2013, Scholars Abstract Award, Association for Clinical Research Training and Society for Clinical and Translational Science Annual Meeting, Washington, D.C.



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M. Lynn Crismon, Dean  
Carlton K. Erickson, Associate Dean for Research and Graduate Studies  
Susan Brown, Assistant Dean for Development



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