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FACULTY IN MEDICINAL CHEMISTRY
Kuberan (Kuby) Balagurunathan
Professor of Medicinal Chemistry

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Education & Training:
- M.S., 1994, Indian Institute of Technology, Madras
- Ph.D., 2000, University of Iowa
- Post-Doctoral Training, 2001-2004, MIT

Research Interests:
In the post-genomics era, it is now accepted that complex glycoconjugates such as proteoglycan regulate numerous patho-physiological processes in all living species. They carry enormous structural information in terms of sulfation, epimerization, domain organization, chain length, number of chains and type of chains along with their core proteins. Production of proteoglycans with such high complexity occurs in template-independent fashion seamlessly, yet our understanding of their biosynthesis, structures and functions is somewhat incomplete and imperfect. We are developing a wide variety of chemical biology tools to define the biosynthetic pathways of heparan sulfate and related glycosaminoglycans (GAG) such as chondroitin sulfate and dermatan sulfate. We synthesize heparin and heparan sulfate structures with a dozen recombinant enzymes to define the structural basis for the interactions of growth factors and Heparan sulfates and the subsequent biological actions. We recently found that a library of click-xylosides produce distinct GAG chains in cellular systems and proposed a GAGOSOME model for the dynamic regulation of combinatorial GAG biosynthesis. These molecular tools are currently used in the lab to define the snap shots of biosynthetic events and signaling events that are associated with development and diseases with a final goal to advance the study of heparanomics.
Amy M. Barrios
Associate Professor of Medicinal Chemistry

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Education and Training:
- B.S., 1989, University of Utah, Salt Lake City, UT, Chemistry
- Ph.D., 2000, Massachusetts Institute of Technology, Cambridge, MA, Inorganic Chemistry

Research Interests:
Our laboratory has focused on developing chemical tools that can be used to solve important biological problems. In particular, our work has focused on developing novel approaches to assaying enzymatic activity. For example, we have developed a fluorogenic, phosphotyrosine mimetic amino acid that can be used to develop peptide-based substrates for assaying Protein Tyrosine Phosphatase (PTP) activity both in vitro and also in living cells. We have also developed a novel fluorogenic assay for enzymes that produce hydrogen sulfide, including Cystathionine beta-Synthase (CBS). We have conducted a series of high-throughput screens to identify novel inhibitors of both the PTPs and CBS and have used the combination of tools developed in our lab to develop greater insight into the biological activity of these diverse but critically important enzyme families. Our work on understanding tyrosine phosphorylation and hydrogen sulfide mediated cellular signaling continues as we add a new area of research to the laboratory: developing a panel of enzyme activity assays for use in profiling the functional capabilities of a complex microbiome.
Grzegorz (Greg) Bulaj  
Associate Professor of Medicinal Chemistry

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Education and Training:
- M.Sc., 1989, Biochemistry, University of Wroclaw
- Ph.D., 1993, University of Wroclaw, Poland

Research Interests:
The long-term goal of our research is to develop a drug-device combination therapy which targets a chronic disease at both molecular and behavioral levels. Two reasons for advancing such strategy are: (1) approximately half of chronically-ill patients do not take medication as prescribed, and (2) mobile medical applications and medical devices provide tools for behavioral interventions and disease management. The integrated molecular-behavioral targeting of a chronic disease opens new opportunities to improve medication adherence and pharmacotherapy outcomes. Our current research is focused on medical devices to be combined with appropriate drug-based therapies for treating cancer or epilepsy. We have been developing an exercise-empowerment mobile therapy for the treatment of cancer-related fatigue and depression in pediatric oncology patients.

We also discover and develop neuropeptide-based drug leads for the treatments of epilepsy and pain. These are collaborative projects with Prof. Olivera from the Department of Biology, as well as with Prof. Steve White from the Department of Pharmacology and Toxicology. For example, we have developed a galanin-based lead compound, NAX 810-2, which is currently undergoing Investigational New Drug (IND) enabling studies in order to enter clinical trials in patients with epilepsy. The technology is licensed to the startup company NeuroAdjuvants, co-founded together with Prof. White. NAX 810-2 and related compounds result from lead optimization studies of 200+ neuropeptide-based analogs with improved receptor subtype selectivity and permeability across the blood-brain barrier. Many of these compounds also exhibit analgesic properties, offering opportunities to develop first-in-class therapies for inflammatory and neuropathic pain.
Tom Cheatham III
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Education and Training:
- B.S., 1989, Middlebury College, Middlebury, VT, Chemistry (Honors)
- B.S., 1989, Middlebury, VT, Mathematics and Computer Science
- Ph.D., 1997, University of California, San Francisco, Pharmaceutical Chemistry

Research Interests:
The research in the Cheatham lab involves the application of molecular modeling, computational chemistry, and large-scale simulation methods on high performance computers to provide insight into the structure, dynamics and interactions of biomolecules. To enable this, we not only develop but apply a variety of tools and methodologies including molecular dynamics and free energy simulation methodologies (AMBER) to study proteins, nucleic acids and interacting ligands in their native environments. Thanks to advances in computer power and the methods, we have witnessed tremendous advance in our ability to reliably represent, converge and reproducibly elucidate the conformational ensemble of biomolecules. Despite these advances, there are still major issues related to the energetic representation and the sampling of thermally accessible conformations for larger systems. By exposing these deficiencies, we can then investigate means to overcome them, and ultimately provide insight above and beyond what can be seen experimentally.
Darrell Davis  
Professor and Chair of Medicinal Chemistry

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Education and Training:
- B.S., 1982 Chemistry, University of Puget Sound
- Ph.D., 1988, Organic Chemistry, University of Utah

Research Interests:
My laboratory is involved in the study of nucleic acid and protein structure using high-field NMR spectroscopy. We have recently developed a structure-based drug design program focused on discovering and optimizing small molecules that interact with biomedically relevant RNA targets. NMR spectroscopy is uniquely suited to solving the 3D structures of RNA domains in complex with inhibitor molecules, and NMR also is a unique tool for identifying lead compounds that only interact weakly with macromolecules. The University of Utah has an outstanding biomolecular NMR facility with 500, and 600 MHz instruments locally, and access to 800 and 900 MHz instruments at the University of Colorado.

Hepatitis C virus (HCV) infection is a major cause of liver cancer in the US and liver disease associated with HCV accounts for the majority of liver transplants. In the developing world, a high percentage of HIV patients are also co-infected with HCV, presenting a particularly challenging health problem. The 5' untranslated region of the HCV RNA genome contains a large structured domain that serves as an IRES (internal ribosome entry site) that enables 5' cap independent RNA translation. The IRES of HCV is an attractive therapeutic target since it is crucial for HCV replication. The RNA has a well-defined structure, providing a ready-made target for developing targeted therapeutics against HCV. HCV also provides a paradigm for understanding RNA virus replication and insight into this system can be applied to the next emerging viral threat.
Raphael Franzini  
Assistant Professor in Medicinal Chemistry

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Education and training:
- M.Sc., 2005 Ecole Polytechnique Fédérale de Lausanne
- Ph.D., 2010 Stanford University
- Postdoctoral Fellow, 2010-2012 Stanford University, 2012-2015 ETH Zürich

Research Interest:
My research group focuses on the interfaces of Chemistry, Biology and Medicine with the aim of developing novel types of therapeutic agents, imaging probes and diagnostic assays. One particular research goal is the development of DNA-encoded chemical libraries as prospective tools for drug discovery and their application to lead development for cancer-associated targets. DNA-encoded libraries are collections of compounds in which each small molecule is uniquely encoded by a covalently linked DNA sequence. Panning encoded libraries for the protein of interest enriches target-binding molecules and high-throughput sequencing of the DNA-barcodes enable the straightforward identification of the corresponding structures. Encoded library technology allows screening ultra-large compound collections in a one-pot protocol. In addition to setting up a platform of libraries and screening them for drug candidates, we aim to expand this technology beyond the identification of affinity ligands and to constantly improve methodologies for library synthesis, encoding and screening.
Further research interests include the development and optimization of ligand-based tumor targeting strategies as therapeutic and imaging modalities and binary molecular probes for clinical diagnostics.
Margo Haygood
Research Professor of Medicinal Chemistry

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Education and Training
- B.A., 1976, magna cum laude, Harvard University, History and Science
- Monbusho scholar, 1979-1981, Tokyo University
- Ph.D., 1984, Marine Biology, Scripps Institution of Oceanography, University of California, San Diego

Research Interest:
Our group has investigated symbiosis between marine microbes and animals for more than 30 years. We've focused on bioactive metabolite symbioses, in which microbial symbionts of marine invertebrates biosynthesize secondary metabolites, often for chemical defense, since the 1990s. Our lab uses the tools of microbiology, molecular biology, chemistry and advanced microscopy to investigate these systems, collaborating with chemists, notably Eric Schmidt, to forge a comprehensive understanding of symbiotic metabolites, and use these insights for drug discovery and development. I've been project director of the Philippine Mollusk Symbiont ICBG since 2008. This large collaborative project combines drug discovery with research on mollusk biodiversity and enhancement of research capacity in the Philippines.
Chris Ireland  
**Distinguished Professor of Medicinal Chemistry, Past Dean of the College of Pharmacy**

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**Education and Training:**
- B.S., 1973, University of California at San Diego, CA, Chemistry  
- Ph.D., 1977, Scripps Institution of Oceanography, La Jolla, CA, Oceanography

**Research Interests:**
Our program has focused on the discovery and development of novel anticancer agents from a variety of natural products sources. The underlying theme of this program is to integrate discovery of novel biologically-active natural products from organisms that inhabit unique ecological niches with mechanism-directed cancer biology. The rationale behind this approach is that chemical diversity stems from biological diversity and environmental pressures which select for unique genotypes. Also, new mechanism-based assays which target receptors or pathways that are overor selectively expressed in cancer cells will further select for novel chemotypes with potential utility in the treatment of human cancers. Over the last two decades this program has been successful in the discovery and characterization of over a hundred unique marine natural products with antitumor properties.
Siam Oottamasathien
Adjunct Faculty

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Education and Training:
- B.A., University of Colorado, Double Major, Molecular Biology and Biochemistry
- M.D., University of Colorado School of Medicine
- Intern, University of CO and Denver Health Sciences Center General Surgery
- Residency, University of CO and Denver Health Sciences Center General Surgery
- Residency, University of CO and Denver Health Sciences Center Urology
- Chief Resident, University of CO and Denver Health Sciences Center Urology
- Fellowship, Vanderbilt University, Pediatric Urology

Research Interests:
Dr. Oottamasathien launched a pediatric urology basic science research program for the group in 2007. His initial work was in the Department of Human Molecular Biology and Genetics at the University of Utah, investigating the role of T-box proteins in genitourinary development. During that time, he gained invaluable research tools, developed elaborate experimental designs, including the use of germ-line and conditional mutagenesis experiments in mice, and further enhanced his background in genitourinary embryology, molecular biology, and developmental biology. In addition, he was awarded a three year NIH T32 training grant (5T32HL079874) under the auspices of Nobel Laureate Dr. Mario Capecchi and received NIH loan repayment program (LRP) funding for pediatric research. After spending a year and a half along this line of research, more clinical translational science was necessary and he partnered with the laboratory of Glenn Prestwich, PhD, a senior investigator and presidential professor of medicinal chemistry at the University of Utah.
Eric Schmidt
Professor of Medicinal Chemistry

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Education and Training:
- B.S., 1994, University of California at San Diego
- Ph.D., 1999, Scripps Institution of Oceanography
- NIH Fellowship, 1999-2001, Johns Hopkins University

Research Interests: Secondary metabolites (natural products) are central both to interactions between organisms and to human health. The goals of my lab are (i) to understand the basic biology and chemistry of secondary metabolism; (ii) to apply that understanding to synthetic biology and metabolite engineering; (iii) to understand the chemical mechanisms of biosynthetic enzymes; and (iv) to discover and develop new drug lead natural products.

Marine animals are renowned sources of natural products with pharmaceutical potential. Research shows that several compounds are not made by the animals themselves, but rather by symbiotic bacteria. My lab is working to achieve a fundamental understanding of the players involved in synthesizing secondary metabolites in marine animals. We apply this knowledge in the discovery and engineering of small molecules with therapeutic potential.

Research area 2. RiPP biosynthesis.
The ribosomally synthesized natural products (RiPPs) are among the most ubiquitous and abundant bioactive compounds in nature. We study how they are synthesized from a biochemical and synthetic biology perspective.

Cultivated bacteria are rich sources for discovery of new bioactive agents. In a collaborative project with researchers in the Philippines and the US, we are exploring the potential of mollusk symbionts to synthesize natural products that affect neurons and that have potential to treat disease.
Jaclyn M. Winter
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Education and Training:
- B.S., 2004, State University of New York College at Fredonia, NY, Chemistry and Molecular Genetics
- Ph. D., 2010, Scripps Institution of Oceanography, UCSD, Marine Natural Product Biosynthesis
- Postdoctoral Fellow, 2010-2011 Leibniz Institute for Natural Product Research and Infection Biology, Hans Knöll Institute, Germany
- Postdoctoral Fellow, 2011-2014, University of California at Los Angeles

Research Interests: Secondary metabolites are specialized small molecules produced in nature and often possess a variety of biological activities that can be used toward improving our quality of life. These molecules possess exquisite chemical diversity and are often an inspiration for the development of new pharmaceutical agents. At a time when antibiotic resistant bacterial infections are reaching epidemic proportions, there is an urgent need to discover new therapeutic agents. It has been shown that biological pressures influence the structural diversity of compounds produced in nature and marine-derived microorganisms often contain specialized enzymes not found in their terrestrial counterparts. Thus, these specialized microorganisms serve as an ideal resource for drug discovery efforts and for the characterization of novel biosynthetic enzymes. Our lab is focused on 1) elucidating the biosynthetic blueprint that nature uses for assembling biologically active compounds in bacteria and fungi, 2) manipulating and reprogramming biosynthetic systems to generate new compounds with enhanced biological activities and 3) developing individual enzymes that carry out complicated reactions into renewable and environmentally friendly biocatalysts. These enzymes can be engineered to enhance the efficacy of existing therapeutics or be used in the synthesis or semisynthesis of pharmaceutically important compounds.
FACULTY IN PHARMACEUTICS & PHARMACEUTICAL CHEMISTRY
You Han Bae  
Professor of Pharmaceutics and Pharmaceutical Chemistry

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Education and Training:
- B.S., Seoul National University, Seoul, South Korea, Chemical Engineering  
- Ph.D., University of Utah, Salt Lake City, UT, Pharmaceutics

Research Interests:
Dr. Bae’s research group in the Department of Pharmaceutics and Pharmaceutical Chemistry develops polymer-based multifunctional nanocarriers (e.g., micelles made from amphiphilic block copolymers) to overcome multidrug resistance in cancer cells and address tumor heterogeneity, utilizing tumor microenvironment. For example, a polymeric micelle hides a particular moiety during circulation, which has the strong capability to translocate the micelle into cells, and expose the moiety in the tumor extracellular environment to facilitate the internalization process. Thus, micelle technology turns a non-specific cell internalizing vector into a tumor specific tool. For this purpose, the slightly acidic tumor extracellular pH (pHe: pH 6.6-7.0) has been selected as a triggering signal for exposure of the moiety because this acidity is natural in most solid tumors and is confined to extracellular space. This new system broadens the range of solid tumors that can be treated using targeted chemotherapy. The micelle after endocytosis induced by the internalizing moiety presents simultaneous triggered release in endosomes (around pH 6) and endosomal disruption to provide higher concentrations of the drug in the cytosol and nucleus (drug acting sites in a cancer cell). His research interest covers effective delivery systems of genetic materials, such as small interfering RNA and plasmid DNA, and protein drugs. He is also interested in developing a new platform of preclinical test systems, including engineered 3-D tumors for in vitro drug screening and orthotopic tumors in immuno-competent animals for efficacy test, toxicological evaluation and pharmacokinetic/pharmacodynamic study in a same model, which may increase predictive power of drug candidates in clinical trials. Contact me at you.bae@utah.edu for further information.
Mingnan Chen  
Assistant Professor of Pharmaceutics and Pharmaceutical Chemistry

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Education & Training:
- B.Sc., Jimei University, Xiamen, China, Aquaculture
- M.Sc., Peking University, Beijing China, Biological Sciences
- Ph.D., University of Connecticut, Storrs, CT, USA, Pharmaceutical Sciences
- Post-Doctoral Research Associate, Duke University, Durham, NC, Biomedical Engineering

Research interests:
Dr. Chen’s research addresses several challenges at the interface of immunology, material science, pharmaceutical science, and cancer therapeutics development.

To modulate the immunogenicity of functional peptide materials: The immunogenicity of peptide materials impacts many of their biomedical applications. We are interested in understanding the interplay between exogenous polypeptides and the host immune system so that we are able to tailor the immunogenicity of the polypeptide materials as desired. Our goal is to offer insights on how to generate peptide materials that have both an appealing function and an immunogenicity that supports the function.

To revitalize host anti-tumor immunity: Throughout tumorigenesis, tumor cells and tissues evolve to overcome and dampen host immunity. However, anti-tumor immunity can be revitalized and the tumor’s dominance reversed by immunotherapies such as vaccination and immune checkpoint blockade. These therapies have achieved some clinical successes in melanoma, prostate cancer, and cervical cancer. In order to broaden their successes in a wider range of cancer, we are integrating drug delivery principles and our immune-tolerant elastin-like polypeptide (iTEP) nanoparticles together to create drug carriers that would improve the efficacy of these therapies.

To stop metastasis: Given cancer stem cells’ critical role during tumorigenesis and metastasis, a reduction in their numbers could lead to a significant inhibition of metastasis. To this end, we are leveraging these cells’ unique physiological and pathological characteristics to devise iTEP-based carriers that target cancer stem cell-specific drugs to these cells, boosting the drug’s effectiveness and inhibiting metastasis.
Andrew Dixon  
Research Assistant Professor, Department of Pharmaceutics & Pharmaceutical Chemistry

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Education and Training:

• B.S., Southern Utah University  
• Ph.D., University of Utah  
• Post-Doctoral Fellow, Promega Corporation

Research Interests:

Dr. Dixon’s broad research interest is in applying protein engineering to the development of biotherapeutics, diagnostics, and theranostics. Currently, Dr. Dixon is developing a platform technology termed Target Engaged Complementation (TEC). In TEC, two antibodies (or other binding moieties) which target distinct epitopes of the antigen are fused or conjugated with inactive fragments of an enzyme. The binding to the antigen brings the fragments into proximity and enables them to form the active enzyme (complementation). By using fragments of a luciferase, TEC enables fast, easy, and sensitive homogeneous immunoassays. Alternatively, TEC can be used as a therapeutic or theranostic by replacing the split luciferase with an enzyme capable of activating a prodrug. The ability to achieve constant activation of the prodrug by an enzyme that is only active at the target site make TEC an appealing platform for drug delivery.
Shuyun Dong  
Research Assistant Professor, Department of Pharmaceutics & Pharmaceutical Chemistry  
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Education and training:  
- M.D., 1993, West China University of Medical Sciences, Chengdu, China,  
- M.P.H., 1996, in Environmental Health, School of Public Health, Sun Yat-sen, University of Medical Sciences, Guangzhou, China  
- Ph.D., 2008, in Molecular Genetics and Microbiology, University of Massachusetts Medical School, Worcester, MA,  

Research Interests:  
My long-term goal is to conduct research that aims to improve our understanding and treatment of neurologic diseases and cancers through manipulating RNA. During my Ph.D. work, I systematically studied several key events in mRNA life cycle including: splicing, localization, translation and degradation. My original findings were published in Molecular Cell and PLOS Biology. My postdoctoral research focused on understanding the alternative splicing of RNA and developing novel therapeutics for RNA splicing related diseases. My postdoctoral works were published in journals including Nature Molecular Page, Nature Protocols, Molecular Biosystems, and The Journal of Biological Chemistry. One of my articles was selected as Paper of This Week by The Journal of Biological Chemistry. My present research interests at the University of Utah include:  
Engineering and delivering therapeutic RNA-binding proteins, developing therapeutic approaches based on mechanics of RNA alternative splicing and degradation.
Hamid Ghandehari
Professor of Pharmaceutics and Pharmaceutical Chemistry

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Education and Training:
- B.S., Pharmacy, University of Utah
- Ph.D., Pharmaceutics and Pharmaceutical Chemistry, University of Utah

Research Interests:
Dr. Hamid Ghandehari, expert in drug delivery, is a USTAR Professor at the Departments of Pharmaceutics & Pharmaceutical Chemistry and Bioengineering, Director of Utah Center for Nanomedicine and the Nanotechnology Training Program, and Co-Founder and Co-Director of the Nano Institute of Utah. His research focuses on the design of new polymers for gene therapy of head and neck cancer, targeted drug delivery to prostate tumors, oral delivery of chemotherapeutics, and assessing the biocompatibility of silica and dendritic nanoconstructs. For example in his research Dr. Ghandehari attaches highly cytotoxic drugs such as docetaxel to polymers that home to prostate tumors to increase efficacy and reduce toxicity. He evaluates how structures and surface charge of polymers influence transport across the epithelial barrier of the gut in order to deliver cancer chemotherapeutics, such as camptothecin analogs that are poorly bioavailable, by the oral route. His research group also makes polymers that are liquid at room temperature, and when mixed with genetic material and injected to head and neck tumors, form gels that deliver the therapeutic cargo over a prolonged period of time. This approach maximizes efficacy of gene therapy and minimizes repeated administration and toxicity. His lab also evaluates how shape and surface properties of nanoparticles influence their uptake by cells, and their biodistribution.

Dr. Ghandehari is Editor in Chief of Advanced Drug Delivery Reviews, Fellow of the American Institute for Medical and Biological Engineering, the American Association of Pharmaceutical Scientists, and the Controlled Release Society, and serves on boards of several drug delivery journals and organizations. He has published over 170 articles, and given over 220 invited talks nationally and internationally. He received his BS in Pharmacy (1989) and PhD in Pharmaceutics and Pharmaceutical Chemistry (1996) from the University of Utah.
David W. Grainger  
**Professor**  
Distinguished Professor and Chair, Department of Pharmaceutics and Pharmaceutical Chemistry  
Inaugural George S. & Dolores Doré Eccles Presidential Endowed Chair of Pharmaceutics and Pharmaceutical Chemistry  
2008 Elected Fellow, American Association for the Advancement of Science  

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**Education and Training:**  
- B.A., 1983, Dartmouth College, Hanover, NH, Engineering and Chemistry  
- Ph.D., 1987, University of Utah, Salt Lake City, UT, Pharmaceutical Chemistry  
- Alexander von Humboldt Postdoctoral Fellowship, 1988-89, Mainz, Germany  

**Research Interests:**  
**Delivery of biologics, combination medical devices, implant infection, diagnostics**  
Dr. Grainger’s research focuses on several current challenges at the interface between biomedical materials and medicine. The overall themes are:  
1. improving implanted medical device performance  
2. drug delivery of new therapeutic proteins, nucleic acids and live vaccines  
3. nanomaterials interactions with and biodistributions in human tissues  
4. low-infection biomaterials and implanted devices, and  
5. innovating diagnostic devices based on DNA and protein biomarker capture.  

Additionally, Grainger’s research exploits advanced applications of surface analytical methods to understand the physics and chemistry of biomedical interfaces, including difficult surface patterns and nanomaterials.  

Millions of implanted medical devices come with a number of intrinsic risks and performance problems. Common issues include blood coagulation, inflammation, immune acceptance, fibrosis, and infection. New combination medical devices incorporate on-board drug delivery systems designed to address these problems. Drug released from devices include anti-fibrotics/inflammatories (e.g., dexamethasone), anticoagulants (e.g., heparin, warfarin), antimicrobials (e.g., minocycline, rifampicin, chlorhexidine, silver salts), and tissue growth promoters and healing therapeutics (e.g., recombinant growth factors). These require dosing and formulation parameters specific to each drug and device challenge. Other biopharmaceutical drug classes (therapeutic DNAs, RNAi technology, peptide drugs, recombinant proteins, and cell-based therapies) might better be delivered locally and directly from controlled release devices and in formulations from the surface of medical devices as implants (combination medical devices). Nanotechnologies are used to enhance device drug formulation and delivery.
James N. Herron
Associate Professor, Department of Pharmaceutics and Pharmaceutical Chemistry, University of Utah; Adjunct Associate Professor, Department of Bioengineering, University of Utah; Executive Associate Dean for Professional Education, College of Pharmacy, University of Utah

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Education & Training:
- B.S. degree, Biology (minoring in Chemistry), University of Illinois, Urbana-Champaign
- M.S. and Ph.D. Microbiology, University of Illinois, Urbana-Champaign
- Postdoctoral training, University of Utah, structure biology and optical biosensor technology

Research Interests: Dr. Herron is interested in translational research – specifically, translating innovative near-patient diagnostics technologies from the laboratory into the clinic. Presently, his research is focused in three areas: 1) optical biosensor applications in biodefense, diagnostics, companion diagnostics, environmental and food testing, and personalized medicine; 2) high-throughput homogeneous fluorescence assays for use in biodefense, diagnostics, and quality control and assurance; and 3) dynamic light scattering as a means of detecting intravenous (IV) drug incompatibilities, when co-administered through the same IV line. He has published 113 full-length research articles and 107 abstracts. He also edited a book entitled "Physical Methods to Characterize Pharmaceutical Proteins."

Dr. Herron has 32 US and 41 foreign patents, and has co-founded three different point-of-care diagnostics companies to commercialize biosensor technology developed in his laboratory. He has also consulted for 3M Corporation, Abbott Laboratories, Agri-Analysis, ARUP Laboratories, Echelon Biosciences, Johnson & Johnson, Kansas Technology Enterprise Corporation, and mBIO Diagnostics. He also chaired the translational development subcommittee of the Rocky Mountain Regional Center of Excellence in Biodefense and Emerging Infectious Disease (RMRCE), a NIH-sponsored center that supports basic and translational research in biodefense and infectious disease, with focus on developing countermeasures for both.
Sung Wan Kim  
Distinguished Professor of Pharmaceutics & Pharmaceutical Chemistry,  
Distinguished Professor of Bioengineering

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Education and Training:
- B.S., 1963, in Chemistry from Seoul National University, Korea
- M.S., 1965, in Physical Chemistry from Seoul National University, Korea
- Ph.D., 1969 in Chemistry from University of Utah

Research Interests: Professor Sung Wan Kim was Director of the Center for Controlled Chemical Delivery at the University of Utah from 1985-2006. He is a pioneer in drug delivery research and has engaged in his research since 1974 in the areas of hydrogels, biodegradable drug conjugates, self-regulating drug delivery and stimuli sensitive polymers. He also worked extensively in medical polymers, especially blood compatible polymers. Dr. Kim's present research includes design of novel polymers for the delivery of protein drugs, cells and genes.

Dr. Kim has been elected to three U.S. national academies: National Academy of Medicine (1999), National Academy of Engineering (2003) and National Academy of Inventors (2014). Dr. Kim has received other numerous awards; among them are the Terumo Global Science Prize (2014), Research Achievement Award-Pharmaceutical Sciences World Congress (2004), Rosenblatt Prize (2003), Ho-Am Prize (2003), AACP Volwiler Award (2002), American Association of Pharmaceutical Scientists (AAPS) Dale Wurster Award (1998), Controlled Release Society (CRS) Founders Award (1995), and the Clemson Basic Biomaterials Award (1987). These awards are the highest scientific awards from their respective societies. He is the Founder and served as Co-Chairman of the International Symposium on Recent Advances in Drug Delivery, Salt Lake City, 1983-2005.

In 2006, Dr. Kim received an honorary doctorate degree from the University of Twente. From 2004 to present, Dr. Kim is a Hanyang Distinguished Professor at Hanyang University.

Dr. Kim to date has published over 500 papers and owns 35 U.S. Patents. He has trained over 150 scientists.
Jindřich Henry Kopeček
Distinguished Professor of Pharmaceutics and Pharmaceutical Chemistry, Distinguished Professor of Bioengineering

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Website: http://www.pharmacy.utah.edu/pharmaceutics/groups/kopecek/

Education & Training:
- M.S., 1961, Institute of Chemical Technology, Czechoslovakia, Macromolecular Chemistry
- Ph.D., 1965, Institute of Macromolecular Chemistry, Czechoslovakia, Macromolecular Chemistry
- Postdoctoral Fellow, 1967-1968, National Research Council of Canada, Ottawa
- D.Sc., 1990, Czechoslovak Academy of Sciences, Chemistry

Research Interests:
Research in Kopeček’s laboratory focuses on three areas: a) Macromolecular therapeutics with emphasis on development of polymeric drug carriers and novel therapeutic strategies; b) Design of smart biomaterials that self-assemble from hybrid copolymers composed of synthetic polymers and complementary biological domains; c) Application of biomaterials biorecognition principles to biological systems – design of drug-free macromolecular therapeutics.

Macromolecular therapeutics: Recent research focuses on the design of backbone degradable, long-circulating polymer carrier – drug conjugates for the treatment of ovarian, prostate and pancreatic cancers. These second-generation conjugates have longer intravascular half-life, higher accumulation in tumor tissue and substantially enhanced therapeutic efficacy.

Smart biomaterials: The research centers on the design of polymer – peptide/protein/oligonucleotide hybrid biomaterials, where self-assembly is mediated by biorecognition of complementary domains. These materials are being evaluated as biomineralization matrices for bone tissue engineering and as 3D cell culture scaffolds.

Drug-free macromolecular therapeutics: The biorecognition of complementary motifs identified in biomaterials studies can be applied to a living system and mediate a biological process. Formation of antiparallel coiled-coil heterodimers or hybridization of oligonucleotides on B-cell surfaces results in crosslinking of CD20 receptors and apoptosis of Raji B cells. This concept was validated in vitro, in vivo and on cells isolated from patients and is being developed as a novel therapeutic approach for the treatment of non-Hodgkin’s lymphoma and rheumatoid arthritis.
Carol Lim  
Professor and Interim Chair of Pharmaceutics and Pharmaceutical Chemistry

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Education and Training:  
- B.S., 1987, Purdue University, W. Lafayette, IN, Pharmacy  
- Ph.D., 1996, University of California, San Francisco, CA, Pharmaceutical Chemistry  
- Post-Doc, 1999, National Institutes of Health, Bethesda, MD, NCI, PRAT Fellow

Research Interests:  
Our broad research interests are in genes, peptides, and proteins as cancer therapeutics. Understanding the molecular mechanisms of signal transduction pathways (such as the p53 tumor suppressor pathway) in cancer allow us to design novel therapeutics to disrupt cancer.  

“Super p53” for Gene Therapy: p53 is a master switch for cancer prevention and is the ultimate cancer therapeutic. Gene therapy with wild-type p53 has been limited due to its interactions with mutated p53 in cancer. Therefore, re-engineering p53 for cancer gene therapy is a main thrust of our laboratory. We achieve this by targeting p53 to the mitochondria, altering nuclear p53 with new domains, or fusing p53 to other proteins to make novel hybrid proteins. We show that directly targeting p53 to the mitochondrial outer membrane shows potent apoptotic activity (Matissek et al., Pharm Res 2014). We are also altering the tetramerization motif of p53 to allow an exogenously delivered p53 to bypass interactions with malfunctioning wild-type p53 in cancer cells (Okal et al.. Gene Therapy, 2014). This "dominant negative" effect of malfunctioning p53 is the major roadblock for p53 gene therapy. Lastly, we have created novel p53-apoptotic protein hybrids for enhanced apoptosis. Our current disease target is ovarian cancer; the prognosis for ovarian cancer patients have not improved in 40 years, with ~70% of patients succumbing to this disease. Ovarian cancer has mis-localized or mutated p53 and therefore should readily respond to this type of therapy. However, since p53 is mutated in more than 50% of all cancers, the application of this work is widespread to other types of cancers as well, including small cell lung cancer (SCLC), inflammatory breast carcinoma (IBC, an aggressive and deadly form of breast cancer), and or Hepatitis B Virus (HBV)-positive liver cancer. Our ultimate goal is to create a novel therapies that can be used against cancers that currently do not have viable treatment options.
John W. Mauger
Professor of Pharmaceutics and Pharmaceutical Chemistry

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Education and Training:
- B.S. Pharmacy, 1965, Union University Albany College of Pharmacy
- M.S., 1967, University of Rhode Island
- Ph.D., 1971, University of Rhode Island

Research Interests:
Dr. Mauger’s research is focused on developing standards for pharmaceutical dosage forms that can be used to assure safe and effective medicines. In particular, the application of sound and innovative measurement science to test the dissolution properties of solid dosage forms remains as one of the most useful tools for quality control purposes to assure that the active ingredient is released for therapeutic effect. These standards and tests are recognized for their importance to public health by the United States Pharmacopeia and the U.S. Food and Drug Administration.
Shawn C. Owen  
Assistant Professor of Pharmaceutics and Pharmaceutical Chemistry

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Website: http://www.owenlab.com

Education and Training:  
- B.S., in Chemistry; B.A. in Chinese, 2005, University of Utah  
- Ph.D., in Pharmaceutics and Pharmaceutical Chemistry, University of Utah  
- Postdoctoral Fellow, University of Toronto

Research Interests: The Owen Lab utilizes chemical biology approaches to develop novel therapies. Broadly, we are interested in biotherapeutics, including monoclonal antibody drug conjugates and recombinant growth factor hybrids, and in biomaterials as templates to guide cell-based therapies.

Biotherapeutics: Tumor-specific monoclonal antibody (mAbs) can be coupled with therapeutic and diagnostic agents to generate antibody-drug conjugates (ACDs), combining the highly desirable pharmacokinetic (PK) profile and selectivity of mAbs with the potent cytotoxicity drugs – thereby minimizing side effects while maximizing therapeutic effects. The most explored approaches in developing ADCs are to conjugate more potent drugs or to increase the amount of drug by conjugating large delivery vehicles such as liposomes and micelles. We are focusing on controlling the systemic and cellular pharmacokinetics (PK) of ACDs by creating self-amplifying antibody-drug conjugates.

Biomaterials for Cell-based Therapy: We aim to develop 3D biomimetic scaffolds that guide cell growth, differentiation, and function. In particular, we are combining bioconjugation and drug delivery techniques to provide proper cell adhesion, cell-cell interaction, and the availability of growth factors. Our efforts are focused on constructing 1) synthetic nerve conduits for the enhanced regeneration of injured peripheral nerves, and 2) tunable hydrogel scaffolds that recapitulate the in situ environment of breast cancer to allow the rapid, predictive screening of clinical responses.
Jiyuan (Jane) Yang
Research Professor of Pharmaceutics and Pharmaceutical Chemistry

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Website: http://www.pharmacy.utah.edu/pharmaceutics/groups/kopecek/index.html

Education and Training:
- B.S., 1986, Tsinghua University, Beijing, China, Chemical Engineering
- M.S., 1989, Dalian Institute of Technology, China, Polymer Materials
- Ph.D., 2001, Peking University, China, Biomedical Polymer Science
- Postdoctoral Fellow, 2002-2003, Institute Curie, Paris, France, Liquid Crystal Elastomers (Artificial Muscle)

Research Interests:
- Design and synthesis of backbone degradable macromolecular carriers of anticancer drugs including RAFT polymerization, click bioconjugate chemistry, enzymatically catalyzed degradation of bioconjugates.
- Design of hybrid biomaterials composed of synthetic polymers and peptide motifs.
- Drug-free macromolecular therapeutics based on biorecognition of complementary motifs at cell surface.
- Innovative design and production of antibody-drug conjugates for blood malignancies and solid tumors
FACULTY
IN
PHARMACOLOGY
&
Toxicology
Louis Barrows
Professor of Pharmacology and Toxicology

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Education and Training:
- B.S., 1975, California Polytechnic State University
- Ph.D., 1980, University of California, Irvine, Pharmacology.

Research Interests:

Dr. Barrow’s laboratory is dedicated to the discovery of new anti-cancer and anti-infective agents. Much of what we do can be considered natural products drug discovery. We identify new drug leads based on their novel chemical structure or mechanism of action. Extracts of macro- and microorganisms from coral reefs and tropical rain forests provide the new molecules we isolate and evaluate. Determination of the molecular actions of new molecules and determination of the precise cellular consequences of their activity is often the basis of student doctoral projects. We take bioactive organisms and molecules all the way from the source to the sequencing gel, and then into animal models of human disease.

Our recent major project has focused on linking scientific discovery with conservation and social progress in Papua New Guinea (the “PNG ICBG”). We have supported the development of a research lab in the University of Papua New Guinea (UPNG), School of Medicine and Health Sciences, and we have funded the botanical survey work of the National Herbarium in the School of Natural and Physical Sciences. This collaboration has permitted UPNG students to study here in Utah, and also for Utah students to spend time in PNG offering workshops and hands-on training. We have assisted in many UPNG Honor's and Master's students projects aimed at validating traditional phytomedicines, and identifying their active components. Our work has also funded numerous community education and conservation outreach efforts, which we have linked to the botanical survey expeditions. Our work in PNG has broadened our research interests to include the discovery of new molecules and mechanisms of anti-HIV and anti-TB activity.
Donald Blumenthal
Associate Professor of Pharmacology and Toxicology
Associate Dean for Interprofessional Education and Assessment
Adjunct Associate Professor of Biochemistry
Adjunct Associate Professor of Biomedical Informatics
Associate Editor of Goodman & Gilman's The Pharmacological Basis of Therapeutics, Online edition

Email: Don.Blumenthal@pharm.utah.edu
Website: http://www.pharmacy.utah.edu/pharmtox/

Education and Training:
• B.A., 1975, University of California, San Diego
• Ph.D., 1980, University of California, San Diego, Physiology and Pharmacology

Research Interests:
Dr. Blumenthal’s laboratory is broadly interested in the enzymes known as protein kinases and their roles in cell function and disease. Protein kinases catalyze the phosphorylation of proteins on serine, threonine, and tyrosine residues, which is the most common mechanism for the reversible covalent modification of protein structure and function. Protein kinases are the largest enzyme superfamily in eukaryotes, with more than 500 genes in the human genome. Many protein kinases are directly or indirectly involved in a variety of disease processes including cancer, diabetes, and heart disease, and there are now many drugs that target protein kinases and provide therapies for these diseases.

The protein kinases studied by my laboratory include the cAMP-dependent protein kinase (also known as protein kinase A or PKA), cGMP-dependent protein kinase (PKG), myosin light chain kinase (MLCK), phosphorylase kinase, and the platelet-derived growth factor (PDGF) receptor tyrosine kinase. These protein kinases have very different subunit structures and are regulated in very different ways, even though their catalytic domains are homologous. Our research ranges from biochemical and biophysical studies of protein kinase structure and function, to studies of protein kinase activity in different disease states.

Much of our current basic research efforts are directed towards biophysical studies of protein kinases using fluorescence, circular dichroism (CD), small-angle x-ray (SAXS) and neutron scattering (SANS), and molecular dynamics (MD). We are using these methods to better understand the large-scale dynamic properties of protein kinases and their role in protein kinase function.

We have also recently begun to study a different enzyme, human acetylcholinesterase, the enzyme that hydrolyzes the neurotransmitter acetylcholine. This enzyme is the target of nerve gas agents and several drugs that have therapeutic application in treating glaucoma and Alzheimer's disease. We are interested in developing better antidotes to inhibitors of this enzyme by studying the conformational dynamics of the protein using techniques such as SAXS, MD simulations, and neutron and X-ray diffraction.
Marco Bortolato  
Associate Professor

Email: marco.bortolato@utah.edu

Education and Training:
- M.D., 2000, University of Cagliari, Italy
- Ph.D., 2004, Pharmacology, University of Cagliari, Italy
- Specialization in Neurology 2009, University of Cagliari, Italy

Research Interests:
Our research is primarily focused on the characterization of the biological bases of neurodevelopmental disorders through the employment of behavioral tests in animal models. In particular, our main scientific interest is the identification of the mechanisms of interaction between lipid mediators (including neuroactive steroids and endocannabinoids) and key brain neurotransmitters, such as dopamine and serotonin. To this end, we employ a broad array of behavioral, biochemical and molecular biological techniques, as well as stereotactic surgery and HPLC.

The long-term goal of this research is the development of novel therapeutic agents for the treatment of pathological aggression, autism-spectrum disorder, Tourette syndrome, schizophrenia and impulse-control disorders (such as pathological gambling).

Our laboratory is currently involved in two major translational research projects. The first target of our investigations is the characterization of the molecular substrates of gene x environment interactions in impulsive aggression. The second aim of our research is the development of novel steroid- and cannabinoid-based tools for the therapy of impulse-control disorders, Tourette syndrome, autism and schizophrenia. Both projects involve multiple collaborations with several basic and clinical scientists in US, Canada, Italy, France and Germany.
William Crowley
Professor of Pharmacology and Toxicology

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Education and Training:
- B.S., 1970, University of Connecticut
- Ph.D., 1976, Rutgers University

Research Interests:
My laboratory investigates the neuroendocrine and neurochemical factors that regulate the secretion of anterior and posterior pituitary hormones. In particular, we have focused on identifying and characterizing the actions of brain neurotransmitters and peptides that participate in the regulation of the secretion of luteinizing hormone, the anterior pituitary hormone responsible for ovulation, and prolactin, the anterior pituitary hormone that controls milk secretion in lactation. Multidisciplinary approaches are used in these investigations, including in vivo microdialysis to study release of brain neurotransmitters and peptides in discrete brain areas, biochemical measurements of neurotransmitters and peptides, measurements of expression of specific messenger RNAs involved in neurotransmitter and peptide transmission, neurotransmitter and peptide receptor binding, and various approaches towards studying signal transduction mechanisms. Studies are done in whole animal and in isolated brain tissues and cell culture. Current studies are focused on the actions of neuropeptide tyrosine (neuropeptide Y), which plays a central role in controlling the release of these hormones and in regulating food intake during lactation.

A second line of investigations employs all of these methods to identify and study actions of the neurotransmitter and peptide systems that control the secretion of the neurohypophyseal hormones, oxytocin, which is important for milk release during lactation, and vasopressin, which participates in control of body fluid homeostasis. This work is now focusing on the actions of ovarian hormones on brain transmitters, particularly norepinephrine, glutamate and y-aminobutyric acid, and peptides in late pregnancy that increase the activity of the oxytocin neurosecretory system in preparation for birth and lactation.
Kristen Keefe  
Professor of Pharmacology and Toxicology  
Interim Dean of University of Utah College of Pharmacy  

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Education and Training:  
- B.S., 1984, Case Western Reserve University  
- M.S., 1989, University of Pittsburgh  
- Ph.D., 1992, University of Pittsburgh  

Research Interests:  

Dr. Keefe’s laboratory is interested in the structure and function of the basal ganglia, a group of subcortical nuclei in the brain involved in the control of movement and cognition. The importance of the basal ganglia for normal behavior is highlighted by the profound deficits observed in patients with Parkinson's disease, Huntington's disease, schizophrenia, and drug addiction -- diseases that are associated with dysfunction in the basal ganglia. Our work determines the influence of both endogenous and exogenous chemicals on the function of neurons in the basal ganglia in an attempt to better understand 1) the role that glutamate (via NMDA receptors) and monoamines (dopamine and serotonin) play in regulating the activity of basal ganglia nuclei, 2) the mechanisms by which drugs of abuse that affect the basal ganglia exert both their acute and long-lasting adverse effects, and 3) the mechanisms by which the function of the basal ganglia can be beneficially altered by drugs to better treat sequelae associated with dysfunction in these nuclei. We use numerous techniques to examine the effects of both endogenous and exogenous drugs on basal ganglia function. These techniques include: 1) In vivo microdialysis in the brain of awake animals to examine changes in the release of amino acid, monoamine, and neuropeptide neurotransmitters. 2) In situ hybridization histochemistry to measure changes in the levels of messenger RNAs in brain neurons to examine short- and long-term changes in gene expression in neurons of the basal ganglia. 3) Immunohistochemistry to examine changes in protein expression in defined basal ganglia neurons and nuclei. 4) Behavioral analyses of learning and memory processes mediated by corticostriatal circuits. Coupling these techniques, we can begin to understand how neurotransmitters and drugs acutely affect the function of basal ganglia neurons and the neuroadaptive changes that occur in response to neural injury in the basal ganglia and exposure to therapeutic and abused drugs.
Cameron S. Metcalf  
Research Assistant Professor of Pharmacology and Toxicology  
Associate Director, Anticonvulsant Drug Development Program

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Education and Training:
- B.S., 2001, University of Utah, Salt Lake City, UT, Biology and Human Development/Family Studies
- Ph.D., 2008, University of Utah, Salt Lake City, UT, Pharmacology

Research Interests:
Despite the availability of numerous antiseizure drugs (ASDs), ~30% of all epilepsy patients do not respond to currently available therapies. Therefore, my primary research interest is aid in the development of novel therapies for refractory epilepsy. I have worked to develop neuropeptide analogs that block seizures in animal models of epilepsy. In addition, these neuropeptides also reduce pain behaviors in animal models and the development of these analogs may prove to be first-in-class therapies for both epilepsy and pain. In addition, I have worked to identify and develop combinations of novel epilepsy drug candidates along with established ASDs. This work has led to the identification of drug combinations that act synergistically to reduce seizures and limit potential side effects. While much of this work has been performed in established animal models, there remains a need for novel models of epilepsy with greater face validity to various epilepsy conditions. In collaboration with colleagues in the Anticonvulsant Drug Development Program, we are seeking to establish novel seizure models that may prove beneficial in the development of new epilepsy therapies. Finally, patients with epilepsy are at greater risk for sudden unexpected death. The causes are largely unknown, but are hypothesized to be related to cardiorespiratory dysfunction following seizures. I am therefore interested in both understanding the mechanisms that contribute to SUDEP and the development of potential therapies to reduce risk.
David Moody  
Research Professor of Pharmacology and Toxicology

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Education and Training:
- B.A., 1972, University of Kansas, Chemistry
- Ph.D., 1977, University of Kansas, Experimental Pathology

Research Interests:
Our laboratory has used the power of mass spectrometry (MS) coupled to liquid or gas chromatography to measure amounts of drugs, drug metabolites and other xenobiotics in biological samples. We often use this technology to provide analytical services to other investigators, either commercially or collaboratively. When funding for research is obtained, we have used MS techniques to study in vitro drug metabolism. This includes use of animal models, human liver microsomes, cDNA-expressed drug metabolizing enzymes and human clinical studies. We have examined the role of cytochrome P450s (CYP) 2D1 in rat metabolism of amphetamine, the involvement of different in CYPs in the metabolism of l-acetylmethadol (LAAM) and methadone, and the involvement of both CYPs and glucuronosyltransferases (UGT) in the metabolism of buprenorphine. Currently we are studying in vitro inhibition of the metabolism of oxycodone, methadone and buprenorphine.
Philip Moos  
Associate Professor of Pharmacology and Toxicology

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Education and Training:
- B.S., 1989, University of Colorado, Boulder, CO. Aerospace Engineering Sciences,
- M.S., 1990, University of Colorado, Boulder, CO. Aerospace Engineering Sciences,
- Ph.D., 1994, Kansas State University, Manhattan, KS. Biology,

Research Interests:
The Moos laboratory is broadly interested in understanding cancer susceptibility and the development of resistance. Research efforts are focused on cancer genomics, mechanisms of disease, modifiers of cancer risk, and drususceptibility. Current work is primarily in three arenas: 1) tumor heterogeneity and the role genotype and phenotype in the response to therapeutics during cancer progression, 2) combining genomics and drug screens to identify novel therapeutic agents, and 3) genomic evaluation of nanoparticles for inflammatory potential or other toxic adverse effects.

The first and second area of research are collaborations with Dr. Bild and focus on tumor heterogeneity. Most tumors are thought to have monoclonal origin but by the time they are diagnosed, they are heterogeneous in terms of the subclonal structure driving their growth. We are involved in a collaboration where we are using various genomic strategies, from whole genome sequencing to single cell-RNA sequencing to elucidate the subclonal structure and pathways that dominate the subclones. We are also testing unique drugs and drug combinations to identify new potential strategies for therapeutic intervention.

The third and newer, area of research utilizes transcript profiling and apoptotic studies to evaluate particulate matter toxicity and inflammatory potential. We have found that certain metal oxide manufactured nanoparticles have significant toxicity and induce a cellular response to the stress of the nanoparticles. Nanomaterials provide many benefits and are being utilized more broadly so it is important to understand the potential toxicities, and mitigation strategies prior to use. Therefore, we collaborate with Dr. Ghandehari to understand the basis of the toxicology of materials with the potential for biomedical application. We also collaborate with Dr. Reilly to evaluate the genomic consequences of airborne pollutants that are risk factors for diseases like asthma.
Randall T. Peterson
L. S. Skaggs Presidential Endowed Chair and Dean, College of Pharmacy

Email:

Education & Training:
- B.S., in Molecular Biology, Brigham Young University
- Ph.D., in Biochemistry, Harvard University
- Postdoctoral Fellow, Massachusetts General Hospital and Harvard Medical School

Research Interests: Whereas chemical screening has traditionally focused on simple, in vitro assays, many biological phenomena are difficult to reduce to an in vitro assay. The Peterson lab is using the tools of chemical biology to investigate these complex in vivo phenomena. By conducting high-throughput screens with intact, living zebrafish, small molecules can be discovered that alter virtually any biological process.

The lab is applying this approach in three areas: 1) developmental biology, including cardiovascular development and germ cell development; 2) disease physiology, including heart failure, anemia, and neurodegenerative diseases; and 3) animal behaviors. In each of these areas, the novel small molecules discovered are providing new biological insights and/or novel therapeutic opportunities.
Christopher Reilly
Associate Professor

Email: chris.reilly@pharm.utah.edu

Education and Training:
- B.S., 1994, University of Utah. Biology, minor in Chemistry
- Ph.D., 1999, Utah State University, Toxicology

Research Interests: Dr. Reilly's laboratory has three areas of research: TRP ion channels in lung physiology and disease, mechanistic studies of drug metabolizing enzymes, and biological applications of mass spectrometry.

1. **TRP ion channels** are a family of proteins that exhibit unique functional properties and associated physiological functions. We are interested in how TRP channels regulate physiological and adverse events in the lung, with particular emphasis on the ability of these channels to elicit deleterious pulmonary inflammation and lung cell death when activated by endogenous and/or exogenous agonists; pulmonary inflammation and acute lung damage are two critical components of lung diseases such as asthma, chronic obstructive pulmonary disease (COPD) and emphysema, fibrosis, and acute lung injury/ARDS. Our research is to establish roles of different members of the TRP ion channel family in the development and progression of lung injury and diseases and we have an active research program investigating receptor targets of pneumotoxicants and potential therapeutic inhibitory chemicals, the identification of specific cellular pathways that modulate deleterious and/or beneficial responses of lung cells to TRP channel agonists, and evaluation of TRP channel-dependent pathways in adverse outcomes in experimentally-induced disease states. Currently we are funded by the National Institute of Environmental Health Sciences (NIEHS) to determine how different components of polluted air adversely affect the human respiratory system via interactions with TRP channels and by local sources to study polymorphisms in TRP channels in asthmatic sensitivity to air pollutants. We are also funded by the National Institutes of General Medical Sciences in a collaborative effort with Dr. Eric W. Schmidt (Medicinal Chemistry) to discover and characterize TRP channel modulators from natural sources.

2. **Xenobiotic metabolism** is a collective process by which chemicals that enter our body are modified. We are interested in how human cytochrome P450 enzymes transform chemicals to pharmacologically and/or toxicologically inactive vs. toxic reactive intermediates that damage cellular macromolecules, cells, and organ systems. We have two primary areas of focus: 1) enzymatic and chemical mechanisms of oxygenation vs. dehydrogenation of substrates and analysis of modified biological macromolecules (i.e., DNA and protein) by electrophiles, particularly with respect to such processes in lung tissue; and 2) the elucidation of how variations in drug metabolism mechanisms and efficiency dictate the pharmacological and/or toxicological properties of inhaled and/or systemically-delivered therapeutic drugs. Currently research in this area is supported by grants from the National Institute of General Medical Sciences (NIGMS) and Eunice Kennedy Shriver National Institute of Child Health and Human Development (NICHD).

3. **Mass spectrometry** is a versatile and powerful analytical technology that has revolutionized mechanistic pharmacology and toxicology studies. We use mass spectrometry to quantify a variety of substances in diverse matrices, to establish structures and metabolic origins of drug metabolites in P450 reactions, to discover unknown bioactive substances that have measurable biological activity using metabolomics-based methodology, and to identify macromolecular targets of toxic electrophiles generated by P450s. Mass spectrometric analysis is a routine approach used by our laboratory and it is supported by a variety of research grants, sub-contracts, and collaborations.
Misty D. Smith
Research Assistant Professor of Pharmacology and Toxicology

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Website: http://www.pharmacy.utah.edu/pharmtox/

Education and Training:
- B.S., 1996, Muskingum University, OH, Biology
- Ph.D., 2001, University of South Carolina, Biomedical Sciences (Pharmacology and Physiology)

Research Interests:
Dr. Smith is a behavioral pharmacologist whom serves as a co-investigator in the NIH-sponsored Anticonvulsant Drug Development (ADD) Program in the Department of Pharmacology and Toxicology in the College of Pharmacy. Dr. Smith's current research is investigating the therapeutic potential of novel compounds, such as cannabidiol, for the treatment of epilepsy and its comorbidities and characterizing the drug interactions of cannabidiol with other concomitant therapeutics. Additional related research interests include the pharmacotherapeutic potential of neuropeptides, endocannabinoids and other novel therapeutics in the treatment of chronic pain, substance abuse and other neuropsychiatric conditions. Dr. Smith also has a joint appointment as a career-track (research) Assistant Professor in the Oral Biology, Medicine, and Pathology Section of the School of Dentistry at the University of Utah.
Shashank Tandon
Research Assistant Professor, Pharmacology and Toxicology

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Education & Training:
- B.Sc. (Hons.) (Human Biology), All India Institute of Medical Sciences, India, 2001
- M.Sc. (Physiology), All India Institute of Medical Sciences, India, 2003
- PhD (Neuroscience), National Brain Research Centre, India, 2010

Research Interest:
Dr. Tandon is interested in research relating to neurobiology of binge eating behavior and drug addiction. His current research focuses on the role of binge eating history on future feeding behavior. He is also interested in the role of the lateral habenula (LHb), a crucial area in which aversive stimuli are encoded, in regulating voluntary ethanol consumption during early and late stage of alcohol abuse.
Peter West  
Research Assistant Professor Pharmacology and Toxicology  

Email address: peter.west@utah.edu  

Education and Training:  
- B.S., 1997, Lehigh University, Biochemistry  
- Ph.D., 2003, University of Utah, Neuroscience  

Research Interests:  
Dr. West is a staff scientist in the NIH sponsored Anticonvulsant Drug Development Program where he directs studies determining the electrophysiological mechanism of action of proprietary investigational compounds. Additionally, his research is focused on the pharmacological treatment of diseases that affect cognition such as Epilepsy, Down syndrome, and Alzheimer’s disease. In order to identify novel molecular targets and test potential treatments, an understanding of the pathophysiological basis of cognitive deficit in these diseases must first be obtained and preclinical model systems must be developed. Presently, studies intended to characterize synaptic plasticity deficits in animal models of Epilepsy and Down syndrome are underway. Furthermore, these projects seek to discover and characterize novel treatments to correct these deficits (in the case of Down Syndrome) or to treat seizures and prevent epileptogenesis without affecting synaptic plasticity associated with learning and memory (in the case of Epilepsy). To achieve these goals, the lab currently uses electrophysiological, pharmacological, and immunohistochemical techniques. Of particular note, Dr. West’s laboratory uses specialized equipment which allows the experimenter to perform simultaneous recordings from multiple brain slices, thus allowing for the high-throughput screening of compounds for their effects on long-term synaptic plasticity in a manner that accounts for the day-to-day variability often observed in physiological experiments that use in-vitro brain slices.
Karen Wilcox
Professor of Pharmacology and Toxicology

Email address: kwilcox@deans.pharm.utah.edu

Education and Training:
- B.A., 1981, Allegheny College
- Ph.D., 1993, University of Pennsylvania

Research Interests:
The Wilcox laboratory is interested in understanding basic mechanisms underlying epileptogenesis, seizure generation, and therapy-resistance to anticonvulsant drugs. To achieve these goals, we use electrophysiological, calcium imaging, pharmacological, behavioral, genetic, immunoblot, and immunohistochemical techniques in a variety of in vitro preparations and animal models of epilepsy. Our working hypothesis is that insight into disease-induced changes in neuronal and glial function will provide new avenues for therapeutic interventions in patients at risk for developing epilepsy or those patients who are refractory to current treatment options. To that end, I am also a Co-Investigator in the Anticonvulsant Drug Development (ADD) Program (Principal Investigator, H. Steve White, Ph.D) and direct studies determining the neuroprotection potential of proprietary investigational compounds through a contract with NINDS at the National Institutes of Health. Finally, I am actively seeking rotation students as well as dissertation student.
FACULTY IN Pharmacotherapy
Jennifer Babin
Assistant Professor (Clinical), Pharmacotherapy

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Education & Training:
- B.S., 2009, University of Alabama, Tuscaloosa, AL, Biology
- Pharm.D., 2013, Auburn University, Auburn, AL
- PGY1 Pharmacy Practice Residency, 2014, Greenville Health System, Greenville, SC
- PGY2 Internal Medicine Residency, 2015, University of Utah Health Care, Salt Lake City, UT

Research Interests:
Dr. Babin is a clinical pharmacist practicing at the University of Utah Hospital in internal medicine. Her research interests include topics relating to the care of internal medicine patients, patient education, and interprofessional education.
Joseph Biskupiak  
Research Professor  
Director, Pharmacotherapy Outcomes Research Center  

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Website: http://www.pharmacy.utah.edu/pharmacotherapy/faculty/Biskupiak.htm  

Education & Training:  
- B.S., 1979, University of Connecticut, Chemistry  
- M.B.A., 1995, Seattle University  
- Ph.D., 1985, University of Utah, Medicinal Chemistry  

Research Interests:  
Outcomes research, health services research, US health care delivery system.
Diana Brixner
Professor, Department of Pharmacotherapy,
Executive Director, Outcomes Research Center,
Director of Outcomes, Program in Personalized Health Care
President, Academy of Managed Care Pharmacy
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Education & Training:
- B.S., 1982, University of Rhode Island, Pharmacy
- Ph.D., 1987, University of Utah, Medicinal Chemistry

Research Interests:
Dr. Brixner's research is focused on identifying the value of new technologies associated with cancer treatments and using diagnostics to support treatment decisions. She conducts her research from the perspective of the payer/decision maker for the allocation of health care resources associated with pharmacotherapy. Dr. Brixner has published numerous articles in peer-reviewed journals, including the Journal of National Cancer Center Networks, Value in Health, Pharmacoepidemiology and Drug Safety, the American Journal of Managed Care and the Journal of Managed Care Pharmacy, authored three book chapters, has one issued patent, has been an invited speaker at a variety of international and U.S. based professional meetings, and has presented numerous continuing education programs. She served a two-year term on the Executive Board and as President of the International Society of Pharmacoeconomics and Outcomes Research (ISPOR). Diana is a Fellow of the Academy of Managed Care Pharmacy (AMCP), which recognizes sustained excellence in the pharmacy profession, and exceptional contributions, long-term commitment and active participation in the Academy. She currently serves as the President Elect for AMCP. Her publications are available at this link: https://www.ncbi.nlm.nih.gov/pubmed/?term=diana+brixner
Barbara Crouch
Professor (Clinical) of Pharmacotherapy; Executive Director, Utah poison Control Center

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Website: www.utahpoisoncontrol.org

Education & Training:
• B.S., 1982, Philadelphia College of Pharmacy and Science, Pharmacy
• Pharm.D., 1984, Jointly administered by the University of Texas at Austin and the University of Texas Health Science Center at San Antonio, Pharmacy
• M.S. MSPH, 1994, University of Utah, Public Health
• Clinical Toxicology Fellowship, Maryland Poison Center, University of Maryland School of Pharmacy

Research Interests:
Dr. Crouch’s research interests include providing clinical toxicology consultation and overseeing operations of statewide poison control center, and the epidemiology of poison exposures. Current projects include analyzing a statewide linked-database of poison exposures that includes data from the poison center, pre-hospital, emergency department, inpatient discharge database and death certificates, analysis of coin exposures in children, ocular exposures reported to all poison control centers. Past research projects include characterizing trends in teen OTC drug abuse in Utah and an analysis of poison exposures in older adults.
Michelle Fiander  
Assistant Professor (Research), Pharmacotherapy & DRRC (Drug Regimen & Review Center)  

Email: michelle.fiander@utah.edu  

Education & Experience:  
- MLIS (Library and Information Science) 1996, Dalhousie University (Canada)  
- MA, Literature, 1994, Dalhousie University (Canada)  
- 14+ years Evidence Synthesis, Information Specialist, Cochrane Effective Practice and Organization of Care (EPOC) Review Group; Canadian Agency for Drugs and Technologies in Health (CADTH); and private sector.  
- Research activity: 45 Cochrane Systematic Reviews (author, coauthor, and contributor); 9 peer review publications.  
- Peer reviewer—systematic review methodology, AJOG (American Journal of Obstetrics & Gynecology), Dec 2016 to present.  

Skills:  
- Expert literature searching and search strategy development.  
- Methodological guidance for systematic reviews & other evidence syntheses.  
- Protocol development—evidence synthesis.  
- Training in technologies to support systematic reviewing.  

Research and Practice Interests:  
- Best pedagogical practices for teaching systematic reviewing (and other evidence synthesis) skills.  
- Improving the application of systematic review methodologies in the field—e.g. by practicing researchers.  
- Evidence-based information retrieval approaches.  
- Leveraging technology to support systematic reviewing.
Hannah R. Fudin
Assistant Professor (Clinical) of Pharmacotherapy

Email: Hannah.fudin@pharm.utah.edu
Education & Training:
  • Pharm.D., 2013, Albany College of Pharmacy and Health Sciences, Albany, NY
  • PGY1 Pharmacy Practice Residency, 2014, Virtua, Mt. Holly, NJ/ University of the Sciences, Philadelphia College of Pharmacy, Philadelphia, PA
  • PGY2 Ambulatory Care Pharmacy Residency, 2015, Rhode Island Hospital, Providence, RI/ University of Rhode Island, Kingston, RI

Clinical Specialty: Ambulatory Care, Family Medicine
Research Interests:
Dr. Fudin’s research interests include clinical pharmacists’ role in medication safety, transitions of care and interprofessional practice experience as well as qualitative research in regards to preventative care and patient self-management.

Professional Interests: Dr Fudin’s professional interests include ambulatory care, medication safety and academia. Dr. Fudin hopes to continue to develop her skills as an ambulatory care clinical pharmacist, as an educator and as a mentor. She hopes to develop long-standing clinical programs for patients at her practice site as well as collaboratively develop, carryout, and publish innovative research.
Karen M. Gunning

Professor (Clinical)

Email: karen.gunning@pharm.utah.edu
Website: http://www.pharmacy.utah.edu/pharmacotherapy/faculty/Gunning.htm

Education & Training:
- B.S., 1995, Oregon State University, Pharmacy
- Pharm.D., 1997, University of Utah
- Residency, 1998, University of Washington

Clinical Specialty: Family Medicine

Research Interests: Dr. Gunning received her Doctor of Pharmacy from the University of Utah and completed a postgraduate residency in Family Medicine/Primary Care at the University of Washington. She is currently a Professor (Clinical) of Pharmacotherapy, Adjunct Professor of Family & Preventive Medicine, and clinical pharmacist for the University of Utah Family Medicine Residency Program. She is director of the PGY 2 Ambulatory Care Pharmacy residency at University of Utah Healthcare. She was named the teacher of the year for the College of Pharmacy in 2000, 2009 and 2013, and the specialty teacher of the year for the family medicine residency in 1999 and 2000, and received the University of Utah Distinguished Teaching Award in 2016.

She was Pharmacist of the Year for the Utah Society of Health System Pharmacists in 2007. She recently completed two terms as a member, and was the 2013 chair of the Board of Pharmacy Specialties Pharmacotherapy Specialty Council, and is now serving a three-year term on the Board of Directors for the Board of Pharmacy Specialties. Research interests include curriculum development for pharmacists and medical residents regarding changing models of care delivery, medication safety in the patient centered medical home (PCMH), the impact of pharmacists and the interdisciplinary team on costs, outcomes and efficiency in the PCMH, and the impact of ambulatory care pharmacist engagement in transitions of care.
Holly Gurgle
Assistant Professor (Clinical)
Pharmacotherapy, Clinical Pharmacist,
ARUP Family Health Clinic

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Website: http://pharmacy.utah.edu/pharmacotherapy/faculty/hgurgle.htm

Education & Training:
- B.S., in Biochemistry, 2002-2006, The University of Virginia, Charlottesville, Virginia
- PharmD, 2006-2010, Virginia Commonwealth University, Richmond, Virginia
- PGY1 Pharmacy Practice Residency, 2010-2011, University of Washington Medicine, Seattle, Washington
- PGY2 Ambulatory/Primary Care Pharmacy Residency, 2011-2012, University of Washington Medicine, Harborview Medical Center, Seattle, Washington

Clinical Specialty: Family Medicine, Primary Care

Research Interests: Dr. Gurgle is interested in the role of clinical pharmacists in patient-centered medical home; transitions of care; interprofessional practice and education; employer-based primary care and wellness; specific areas of clinical interest and expertise include cardiovascular and diabetes pharmacotherapy.
Joanne LaFleur
Associate Professor of Pharmacotherapy

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Website: http://www.pharmacy.utah.edu/pharmacotherapy/faculty/Lafleur.htm

Education & Training:
- B.S., 2001, University of Utah, Salt Lake City, UT, Pharmacy Practice
- Pharm.D, 2003, University of Utah, Salt Lake City, UT, Pharmacy Practice
- M.S.P.H., 2005, University of Utah, Salt Lake City, UT, Public Health

Research Interests:
Dr. LaFleur is Director of the Data-driven Collaborative of Informatics, Pharmacoepidemiology, and Health Economics Researchers (DeCIPHER), which does research in the area of pharmacoepidemiology, pharmacoeconomics, and biomedical informatics in the Veterans Health Administration (VHA). Her research focus is on patient adherence with pharmacotherapeutic regimens and designing clinical decision support tools for improving health outcomes. For example, one ongoing line of research, funded by the Agency for Healthcare Research and Quality (AHRQ), involves the development of a fracture risk assessment tool that will be incorporated into the design of computerized clinical decision support tools for osteoporosis in the VHA. She also has a body of research in the factors associated with different levels of patient adherence to drug regimens for chronic conditions such as human immunodeficiency virus (HIV), hepatitis C virus (HCV), and osteoporosis.
Joanita Lake  
Assistant Professor (Research)  
Pharmacotherapy, Clinical Pharmacist,  
Drug Regimen Review Center

Email: joanita.lake@pharm.utah.edu  

Education & Training:  
- B.Pharm, 2000, University of Port Elizabeth, South Africa, Pharmacy  
- MSc (Oxon), 2008, University of Oxford, U.K., Evidence-based Health Care (EBHC)

Research Interests:  
Her research interests lie primarily in the areas of evidence-based health care, drug safety, drug utilization review, prescribing practices, pharmacoepidemiology, pharmacoeconomics, and health policy. Her recent research projects include systematic reviews on opioid misuse and abuse. She is a clinical pharmacist at the Drug Regimen Review Center (DRRC).
Alisyn May
Assistant Professor of Pharmacotherapy

Email: alisyn.may@pharm.utah.edu

Education & Training:
- B.S., 2011, in Chemistry/Health Sciences, Wayne State College, Wayne, NE
- PharmD, 2013, University of Nebraska Medical Center, Omaha, NE
- PGY1 Pharmacy Practice Residency, 2013-2014, University of Utah Hospitals & Clinics, Salt Lake City, UT
- PGY2 Ambulatory Care & Family Medicine Residency, 2014-2015, University of Utah Hospitals & Clinics, Salt Lake City, UT

Clinical/Research Interests:
Dr. Hansen is a clinical faculty member who provides patient care at the ARUP Family Health Clinic. She does research in the area of ambulatory care, family medicine, and geriatrics. Dr. Hansen is interested in studying the role of a pharmacist in the primary care setting, novel ways to engage patients in their healthcare, and medication use in the geriatric population. She also has an interest in researching transitions of care.
Krystal Moorman
Assistant Professor (Clinical)

Email: krystal.moorman@pharm.utah.edu

Education & Training:
- PharmD, 2000-2004, Medical University of South Carolina
- PGY-1 residency, 2004-2005, Medical University of South Carolina
- PGY-2 residency in Drug Information Practice, 2005-2006, Medical University of South Carolina

Clinical Specialty: Community Practice

Research Interests:
Dr. Moorman is primarily interested in medication safety, medication therapy management, and community pharmacy practice and drug information.
Mark Munger  
**Professor, Pharmacotherapy; Adjunct Professor, Internal Medicine**

Email: mmunger@hsc.utah.edu

**Education and Training:**
- B.S.(Pharmacy), 1980, Oregon State University
- Pharm.D., 1984, University of Illinois at Chicago
- Clinical Pharmacology Research Fellowship, 1988, Case Western Reserve University School of Medicine

**Research Interests:**
The Munger Research Group is focusing on several key areas. We have recently completed a large prospective discrete choice experiment that provides patient, pharmacist, and payer empirical support for primary care services delivered through a community pharmacy. We are developing a national demonstration project to show a reduction in quality measures through application of disease prevention education, medication management, and chronic disease management across the United States. This research involves the collaboration of community pharmacy, American Association of Family Physicians, the University of Utah Health, PLC Diagnostics (point-of-care testing), Kantar Millward Brown, and the University of Utah Pharmacotherapy Outcomes Center. We are identifying new roles for approved drugs in CV disease. We have identified a method to reduce NSAID-induced cardiovascular and renal adverse effects. We are currently studying a new role for a drug for the acute treatment of atrial fibrillation.
Nancy Nickman
Professor of Pharmacotherapy and Adjunct Professor of Mechanical Engineering
Department of Pharmacotherapy, College of Pharmacy Clinical Coordinator,
Analytics and Outcomes Pharmacy Services, University of Utah Hospitals &
Clinics, University of Utah

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Education & Training:
- RPh License, 1982, Minnesota; 2011 Utah
- B.S., 1982, University of Montana, Pharmacy
- ASHP Accredited Administrative Residency 1982-1984, United & Children's
  Hospital
- M.S., 1984, University of Minnesota, Hospital Pharmacy
- Ph.D., 1987, University of Minnesota, Social & Administrative Pharmacy

Research Interests:
Dr. Nickman's teaching and research expertise includes patient-centered outcomes
research to improve provision and quality of patient care based on application of
industrial engineering and economic analyses. Publications and presentations include
work sampling evaluations of institutional pharmacy services for re-design of structural
and functional activities, pre-post analyses of the impact of technology on the practice of
health professionals, simulated time-and-motion evaluations coupled with microcost
analyses of issues related to medication preparation and administration, and analysis of
devices intended for medication self-administration.
Heather Nyman
Assistant Professor (Clinical) of Pharmacotherapy

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Website: http://www.pharmacy.utah.edu/pharmacotherapy/faculty/nyman.htm

Education & Training:
- B.S., 2000, Brigham Young University, Provo, UT, Chemistry.
- Pharm.D., 2004, University of North Carolina at Chapel Hill, Chapel Hill, NC
- PGY1 Pharmacy Practice Residency, 2005, University of Utah Hospitals and Clinics, Salt Lake City, UT

Research Interests:
Dr. Nyman is a clinical pharmacist practicing at the University of Utah Hospital in internal medicine. Her research interests are in the area of nephrology. Current projects include an analysis of data from the VA system to compare drug dosing when using the CKD-EPI, MDRD, and Cockcroft-Gault equations.
Patricia Orlando
Associate Professor (Clinical)

Email: patricia.orlando@pharm.utah.edu
Website: http://www.pharmacy.utah.edu/pharmacotherapy/faculty/orlando.htm

Education & Training:
- B.S., 1982, University of Montana, Pharmacy
- Pharm.D., 1985, University of Utah
- Pharmacy Practice Residency, 1985, University of Utah Hospital,
- Residency, 1986, Salt Lake VA, Geriatrics
- Fellowship, 1987, UCLA, Infectious Diseases

Clinical Specialty: Geriatric Infectious Disease Pharmacotherapy
Hanna Raber
Assistant Professor (Clinical)

Email: hanna.raber@pharm.utah.edu

Education and Training:
- Pharm.D. 2014, Drake University, Des Moines, IA
- PGY-1 and PGY-2 Ambulatory Care Residency, 2016, Saint Joseph Regional Medical Center, Mishawaka, IN

Research Interests:
Dr. Raber is a clinical faculty member who provides patient care at the University of Utah Centerville and Madsen Family Medicine Residency Clinics. Her research interests include health communication, global health, and preventative medicine.
James Ruble
Associate Professor (Clinical), Pharmacotherapy

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Website: http://www.pharmacy.utah.edu/pharmacotherapy/faculty/ruble.htm

Education & Training:
- B.S., 1989, University of Utah College of Science, Biology
- B.S., 1992, University of Utah College of Pharmacy, Pharmacy
- Pharm.D., 1994, University of Utah College of Pharmacy
- J.D., 2002, University of Utah College of Law

Research Interests:
Dr. James Ruble’s teaching, scholarship and clinical activities focus on pharmacy and healthcare law, ethical dilemmas in healthcare, pharmacy compounding, community pharmacy practice, communication and conflict. He has received numerous awards for distinguished teaching, including the College of Pharmacy Teacher of the Year (multiple), Hinckley Institute Outstanding Professor Award and the Daniels Fund-David Eccles School of Business Award for Excellence in Ethics Education. He is a member of the Hospital Ethics Committee and is Ombudsman for the University of Utah Health Sciences. He is a member of the Utah Bar and the US Patent and Trademark Office Bar. He is trained conflict resolution and mediation. He received academic degrees in science (BS Biology), pharmacy (BS Pharmacy and Doctor of Pharmacy), and law (Juris Doctor) from the University of Utah. Jim feels privileged to be an educator, clinician, and scholar, but most importantly wants to be a good humanitarian.
Linda Tyler
Chief Pharmacy Officer, University of Utah Health Care, Associate Dean, Pharmacy Practice

Administrative Director, Pharmacy Services
Associate Dean, Pharmacy Practice
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Website: http://www.pharmacy.utah.edu/pharmacotherapy/faculty/tyler.htm

Education & Training:
- B.S., 1978, University of Utah, Pharmacy
- Pharm.D., 1981, University of Utah
- Residency, 1978-1979, University of Nebraska Medical Center, Hospital Pharmacy

Research Interests:
Dr. Tyler’s interests include leadership development, strategic planning for pharmacy services, new drugs, medication use and policy development, medication safety, drug shortages, and evidence based medicine.

Other:
Dr. Tyler serves as residency program director for the Health System Pharmacy Administration Residency (2 year program with MS degree) and co-director of the MS in Health System Pharmacy Administration.
Kyle Turner
PharmD, Assistant Professor (Clinical)

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Education & Training:
- PharmD, 2010-2014, University of Utah College of Pharmacy
- Pharmaceutical Care Leadership Residency, 2014-2016, University of Minnesota College of Pharmacy

Research Interests:
Dr. Turner is a clinical pharmacist practicing in primary care at the University of Utah Westridge Clinic. His research interests include development and impact of primary care pharmacy services, interprofessional practice and education, implementation of the pharmacist’s patient care process in practice and education, continuous quality improvement, and health professional leadership development.
Katie Traylor
Assistant Professor (Clinical), Pharmacotherapy

Email: Katie.Traylor@pharm.utah.edu
Website: https://faculty.utah.edu/u6001401-Katie_L._Traylor,_PharmD/

Education & Training:
- B.S., 2006-2010, in Health Science, Lee University, Cleveland, TN
- PharmD, 2010-2014, University of North Carolina, Chapel Hill, NC
- PGY1 Ambulatory Care Residency, 2014-2015, Carolinas HealthCare System NorthEast, Concord, NC
- PGY2 Ambulatory Care / Family Medicine Residency, 2015-2016, University of Utah Health Care, Salt Lake City, UT

Research Interests:
Dr. Traylor is interested in research relating to team-based care, collaborative drug therapy management, preventive medicine, transitions of care, shared decision-making, continuous quality improvement, and health literacy. Academic interests include scholarship of teaching and learning, interprofessional education and practice, and mentoring. Specific areas of clinical interest include type 2 diabetes, geriatrics, population health, over-the-counter medication use, and underserved populations.
David Young
Professor (Clinical), PGY-2 Pharmacy Residency in Internal Medicine Director

Email: dyoung@pharm.utah.edu
Website: http://www.pharmacy.utah.edu/pharmacotherapy/faculty/young.htm

Education & Training:
- Pharm.D., 1995, Idaho State University, Pocatello, ID, Pharmacy
- Primary Care Specialty Residency, 1996, Idaho State University, Boise, ID

Research Interests:
Dr. David Young is the clinical pharmacist at the Intermountain Cystic Fibrosis Adult Center and Utah Adult Asthma Center at the University of Utah Hospitals & Clinics. Dr. Young is involved with clinical research in the area(s) of cystic fibrosis, asthma, and gastroesophageal reflux disease (GERD).
Daniel M. Witt
Professor (Clinical), Pharmacotherapy;
Assistant Dean for Clinical Affairs

Email: dan.witt@pharm.utah.edu
Website: www.pharmacy.utah.edu/pharmacotherapy/faculty/wittd.htm

Education & Training:
- A.S., 1984, Snow College, Ephraim, Utah, General Studies
- B.S., 1990, University of Utah, Salt Lake City, Utah, Pharmacy
- Pharm.D., 1992, University of Washington, Seattle, Washington

Research Interests:
Dr. Witt’s research passion is anticoagulation therapy. His main focus is on outcomes research regarding the optimal use of anticoagulation therapy in clinical practice. Dr. Witt is a founding member of the Clinical Anticoagulation Research GrOup (CARGO); an international group of pharmacists and physicians focused on answering research questions pertaining to anticoagulation therapy from the perspective of the practicing clinician. Examples of current CARGO research projects include:
- Descriptive Analysis of Anticoagulant Prescribing Patterns for Venous Thromboembolism
- Optimal Management of Patients Presenting with INRs >10 and no Bleeding Symptoms
- Clinical Significance of Potential Drug-drug Interactions with Direct Oral Anticoagulants (DOACs)
- Description of Anti-Xa Monitoring Practices in LMWH use
- Provider Perceptions of Warfarin Dosing Nomograms
- Real-World Analysis of DOAC+antiplatelet use
- Assessment of Labeled vs Off-Label DOAC Dosing
- Patient Preference for DOACs.

Dr. Witt has also conducted research establishing innovative methodologies for identifying complications of anticoagulant therapy using electronic databases, the clinical and economic value of clinical pharmacists, and methods for improving the publication rate of pharmacy resident research projects.