College Of Pharmacy

Faculty Research Publication

Revised January 2017
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FACULTY IN MEDICINAL CHEMISTRY
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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
Director of Graduate Studies, Department of Medicinal Chemistry Director; Center for High Performance Computing, University of Utah

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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.
Zhenjian Lin
Research Assistant Professor of Medicinal Chemistry

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Education and Training:
- B.S., 2000, Ocean University of China, Qingdao, China, Pharmacy
- Ph.D., 2009, Ocean University of China, Qingdao, China, Medicinal Chemistry
- Postdoc, 2009 Jul.-2012Jun. Department of Medicinal Chemistry, University of Utah, with Professor Eric W. Schmidt

Research Interests:
Marine natural products chemistry, NMR and MS for structure elucidation of novel natural products, understanding the origin, biosynthesis, and roles of natural products to the discovery of novel pharmaceuticals and the development of new synthetic biology tools that will impact human health and biotechnology.
Shuanghu Liu  
Research Assistant Professor of Medicinal Chemistry

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Education & Training:
- M.D. (Equivalent), 1986, Zhongshan Medical University, Guangzhou, China, Clinical Medicine.
- M.S., 1991, Hunan Medical University, Changsha, China, Infectious Diseases.
- Ph.D., 1995, Hunan Medical University, Changsha, China, Infectious Diseases.
- Post-doc., 2001-2007. University of Miami, FL; University of Nebraska-Lincoln, NE and University of Kentucky, KY.

Research Interests:
1. **Hepatitis C virus (HCV)**. We have developed an efficient cell culture-adapted systems of Hepatitis C virus and its recombinant viruses with reporter genes (*Renilla* luciferase and *EGFP*). These systems were used for: 1). Identifying novel targets and antiviral drugs of HCV such as the inhibitors of HCV IRES and NS5A. 2). to explore the relationship between the structure and functions of HCV. 3). to understand the molecular mechanisms of HCV infection, replication and molecular pathogenesis.

2. **Screening of anti-cancer drugs**. To screen small-molecule anticancer compounds and validate of their biological targets such as c-MYC inhibitor and Hedgehog pathway inhibitor.
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.
Glenn Prestwich  
Presidential Professor of Medicinal Chemistry

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Education and Training:
- B.S., 1970, California Institute of Technology
- Ph.D., 1974, Stanford University
- Postdoctoral Fellow, 1974-1977, Cornell University

Research Interests: The research in my laboratories is highly translational and includes prominent interactions with physicians and with companies tasked with developing new therapies. We are currently developing therapeutic applications of anti-cancer lysophospholipids, anti-inflammatory sulfated polysaccharides, and hyaluronan (HA)-derived synthetic extracellular matrices (sECMs) for 3-D cell culture and regenerative medicine. In addition, I mentor students and faculty to help them realize the promise of translational research in order to move innovative technology to the marketplace.

1. Signal Transduction Modifying Drugs. Isoform-selective agonists and antagonists of the lysophosphatidic acid (LPA) G-protein coupled receptors (GPCRs) regulate cancer cell proliferation, invasion, and angiogenesis. LPA also is a feedback inhibitor of the enzyme lysophospholipase D (lysoPLD, a.k.a., autotaxin, ATX), a central regulator of invasion and metastasis. An optimal therapeutic profile for cancer treatment would be a metabolically-stabilized, pan-LPA receptor antagonist that also inhibited lysoPLD. One dual activity analog, BrP-LPA, is a long-lived receptor-specific pan-antagonist for LPA receptors and also inhibits ATX.

2. Sulfated Polysaccharide Drugs. The semi-synthetic glycosaminoglycan ethers, or SAGEs, constitute a novel class of inflammation-modulatory therapeutic agents that have three main modes of action: (1) inhibition of cationic proteases, (2) inhibition of P- and L-selectin binding, and (3) antagonism of the receptor for advanced glycation end-products (RAGE). RAGE acts as a biological rheostat, amplifying immune and inflammatory responses in conditions that include diabetic retinopathy and nephropathy, age-related macular degeneration, cystic fibrosis, Alzheimer’s disease, metastatic cancer, and periodontal disease. Our lead SAGE dramatically reduces erythema and neutrophil infiltration in a mouse model for rosacea, shows no adverse effects at injected doses 100 times above those planned therapeutic levels, and reduces of cancer metastasis mediated by RAGE.

3. Synthetic Extracellular Matrices for Regenerative Medicine. We developed injectable and biocompatible vehicles for delivery, retention, growth, and differentiation of stem cells for clinical use in regenerative medicine. This sECM platform is based on in situ crosslinkable HA-based hydrogels. The composition and stiffness of the sECM can be customized for use with progenitor and mature cell populations. The sECM materials are marketed as products for veterinary wound care and bone repair, and as research tools for 3-D culture of stem cells, primary human cells, and orthotopic tumor xenografts. For example, orthotopic, “patient-like” breast, lung, colon, pancreatic, and ovarian tumors were created and then treated with a novel pan-lysophosphatidic acid receptor antagonist that has dual activity as a low nanomolar inhibitor of ATX.
Eric Schmidt
Associate 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: A majority of the world’s most potent and lifesaving pharmaceuticals are derived in one way or another from natural products. These small molecules are produced by a diversity of organisms, especially bacteria, fungi, and plants. Two amazing features of natural products are their efficacy in hitting disease-relevant targets and their structural diversity. It makes sense that natural products should very effectively target specific biological macromolecules. They have a long history of evolving in concert with their biological targets and are finely tuned for communication between organisms. The enormous structural diversity encompassed by natural products is less easy to explain. Hundreds of thousands of small molecules have been cataloged containing functional groups that are bizarre and architectures that are unusual. It remains an open question as to what the underlying genetic mechanisms are that lead to this chemical diversity.

In my laboratory, we apply the tools of organic synthesis, natural products chemistry, genetic engineering, and biochemistry to understand the origin and evolution of natural products. We are particularly interested in symbiotic interactions, where bacteria or fungi are living in close contact with animal hosts. Tropical reefs are incredibly rich in such associations, and tropical reef animals often contain small molecules that are drug leads for human diseases. We are using these associations in metagenomic (environmental genomic) approaches to understand pathway evolution and diversity. Along the way, we have discovered new small molecules, new genes, and new groups of enzymes. We are using these results to engineer production of small molecule libraries for the treatment of human diseases.
Robert Selliah  
Adjunct Faculty

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Education & Training:
• B.S., Special Honors in Chemistry
• Ph.D., Synthetic Organic Chemistry from University of Texas at Austin

Research Interests:
Dr. Selliah has more than 18 years of experience in technology, leadership, and management in drug discovery, medicinal chemistry, and preclinical development in the United States and the global pharmaceutical and biotech sector. He was most recently vice president of Medicinal Chemistry at SAI Advantium Pharma in India, where he led a group of over 200 scientists. Dr. Selliah is a co-inventor of two clinical development candidates—PRLX93936 (oncology, Prolexys) and AL12182 (glaucoma, Alcon)—and several preclinical candidates, and he contributed to the discovery and development of Travatan®, a marketed prostaglandin drug for glaucoma. He currently serves as a consultant in drug discovery, medicinal chemistry, and project management to early-stage biotech companies in the U.S.
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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.
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You Han Bae  
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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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Website: https://faculty.utah.edu/u0784541-Mingnan_Chen/research/index.html

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:
- Associate in Science, Summa Cum Laude, 2003, Snow College – College of Science, Ephraim, UT
- B.S., Summa Cum Laude, 2006, Southern Utah University – Department of Chemistry, Cedar City, UT
- Doctor of Philosophy, 2011, University of Utah – Department of Pharmaceutics and Pharmaceutical Chemistry, Salt Lake City, UT

Research Interests:
I hope to apply the knowledge gained through my experience at Promega Corporation to translational research in pharmaceutics. More specifically, I will use protein engineering approaches to study and improve biologics with the goal of creating new protein-based therapeutics and delivery platforms.
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, Member of Center for Scientific Review College of Reviewers at the NIH, and serves on boards of several drug delivery journals and organizations. He has published over 150 articles, and given over 200 invited talks. He received his BS in Pharmacy (1989) and PhD in Pharmaceutics and Pharmaceutical Chemistry (1996) from the University of Utah.
David W. Grainger  
Distinguished Professor and Chair, Department of Pharmaceutics and Pharmaceutical Chemistry

Email: david.grainger@utah.edu  
Website: http://www.bioen.utah.edu/faculty/DWG/

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

Email: james.herron@utah.edu

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

Email Address: SW.Kim@pharm.utah.edu

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.
Yoshikazu Kumashiro
Research Associate Professor, Department of Pharmaceutics & Pharmaceutical Chemistry

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Education and Training:
- B. Eng., 1999, from Waseda University
- Ph.D., Materials Science from JAIST supervised by Dr. Nobuhiko Yui

Research interests: Development of biomaterials (synthetic polymers, biodegradable polymers) and their hydrogels, Tissue engineering and regenerative medicine, Surface modification and characterization

Special techniques: Polymer syntheses (radical, anion, ring-opening polymerizations, etc.) Surface characterizations (scanning probe microscopes, XPS, etc.) Cell cultures, Small animal experiments (the isolation of rat hepatocyte)
Young Sook “Grace” Lee
Research Assistant Professor, Department of Pharmaceutics & Pharmaceutical Chemistry

Email: mdysgrace.lee@utah.edu

Education and Training:
- B.S., M.D., 1992-1998, Ewha Womans University, College of Medicine, Seoul
- M.S., 2000-2002, Ewha Womans University, College of Medicine, Seoul
- PhD., 2004-2006, Ewha Womans University, College of Medicine, Seoul
Carol Lim  
Professor and Interim Chair of Pharmaceutics and Pharmaceutical Chemistry

Email: carol.lim@pharm.utah.edu  
Website: http://limlab.org

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:

**Disruption of Bcr-Abl for Treatment of Chronic Myeloid Leukemia (CML):** Bcr-Abl, the causative agent of CML, is an aberrant tyrosine kinase that forms tetramers through a dimerization coiled-coil (CC) motif. If tetramerization of Bcr-Abl can be blocked, Bcr-Abl no longer acts as an oncoprotein. We have achieved targeting of Bcr-Abl via a mutant CC that binds tightly to endogenous Bcr-Abl, and induces apoptosis in leukemia cells (Dixon et al., J. Biol. Chem., 2011). Importantly, this mutant CC has been shown to be active against a drug-resistant form of Bcr-Abl with a compound mutation, which currently no targeted drug is effective against (Miller et al., Mol. Pharm., 2013), and is effective against CML cells from patients (Woessner et al., Leukemia, 2015). A peptide version with a leukemia specific cell penetrating peptides was found to kill CML cells as well (Bruno et al., Mol. Pharm., 2015)

**Super p53 for Gene Therapy:** Targeting the tumor suppressor p53 to the mitochondria and nucleus can be used for cancer therapy. p53 is a master switch for cancer prevention and is the ultimate cancer therapeutic target. We show that directly targeting p53 to the mitochondrial outer membrane shows potent apoptotic activity. 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. Our targets include women's cancers including inflammatory breast carcinoma (IBC), an aggressive and deadly form of breast cancer, and ovarian cancer (with ~70% of patients succumbing to this disease). IBC and ovarian cancer both have 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.
John W. Mauger
Professor of Pharmaceutics and Pharmaceutical Chemistry

Email: john.mauger@hsc.utah.edu
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.
Sivaprasad Sukavaneshvar  
Research Assistant Professor, Department of Pharmaceutics & Pharmaceutical Chemistry  
Email: spsukavaneshvar@gmail.com  
Education and Training:  
- B.Eng, 1994, Chemical Engineering, Indian Institute of Technology, Roorkee, India  
- Ph.D., 1999, Chemical Engineering, Brigham Young University (BYU), Provo, UT  
Research Interests: Design and hemocompatibility assessment of blood-contacting materials and devices. Diagnostic instruments and sensors for individualizing pharmacological therapy. Autologous technologies for tissue regeneration.
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
Mario Alburges  
Research Associate Professor, Director of Diversity for the College of Pharmacy

Email: mario.alburges@utah.edu

Education and Training:
- B.S., 1976, University of Zulia, Venezuela, Chemistry
- M.S., 1979, University of Zulia, Venezuela, Toxicology
- Ph.D., 1988, University of Utah, Pharmacology

Research Interests:
Because abuse of psychostimulants such as cocaine and methamphetamine has escalated in recent years, the understanding of the molecular mechanism(s) of action of these drugs on the central nervous system is essential in the development of therapies to treat drug dependence.

In our laboratory, we study the biochemical mechanisms and neurotoxicity of drugs of abuse on brain monoamine (dopamine, serotonin, norepinephrine), and neuropeptides (neurotensin, substance P, enkephalins, dynorphin, neuropeptide Y) systems. We are also interested in understanding the molecular mechanisms underlying the neurotransmitter receptor mobilization (intracellular trafficking) caused by methamphetamine and related drugs.
Louis Barrows  
Professor of Pharmacology and Toxicology  

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

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.
Andrea Bild  
Associate Professor of Pharmacology and Toxicology  

Email: Andreab@genetics.utah.edu  
Education and Training:  
• B.S., 1996, University of Florida, Microbiology  
• Ph.D., 2001, University of Colorado, Pharmacology  

Research Interests:  
Understanding the biological and clinical diversity of cancer is an opportune area for the application of genomic approaches. Molecular-profiling studies, particularly DNA microarray analyses, have the potential to describe the complexity of cancer phenotypes, and provide an opportunity to link these phenotypes to clinically relevant information, such as therapeutic strategies. My lab focuses on the signal transduction pathways that contribute to the oncogenic processes such as tumor initiation or metastasis with the ultimate goal of identifying novel therapeutic strategies. Our laboratory is particularly interested in breast cancer and smoking-related lung cancer.
Donald Blumenthal  
Associate Professor of Pharmacology and Toxicology  
Associate Dean for Interprofessional Education and Assessment

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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 mechanisms of signal transduction. Signal transduction proteins and signaling molecules such as cyclic AMP and calcium ion play important roles in cellular physiology and are the cause of many diseases when they become dysregulated. Our current research efforts are directed towards structural studies of cellular signaling proteins and complexes of signaling proteins that include protein kinase A, calcineurin, EPACs, and acetylcholinesterase. The goal of these studies is to better understand how the organization, architecture, and dynamics of these cellular signaling proteins contributes to their functional properties. These studies will be used to understand the molecular basis of diseases that result from mutations, and how new and existing drugs might be used to mitigate the effects of various diseases and toxic chemicals. Our structural studies use an integrative biophysical and biochemical approach that includes traditional biochemical characterization, synthetic peptide model systems and peptide libraries, and biophysical methods such as fluorescence, small-angle x-ray and neutron scattering, as well as computational methods to integrate data from our laboratory with data from other structural methods such as x-ray crystallography and molecular dynamics simulations. Our recent studies have shown that single-site mutations in critical regions of a signaling protein can have a profound effect on the protein's structure, dynamics, biochemical properties, and its interactions with other signaling proteins. These are the first steps in understanding the molecular basis of many human diseases.
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 and Chair of Pharmacology and Toxicology

Email address: William.Crowley@deans.pharm.utah.edu  

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

Research Interests:  
Dr. Crowley’s laboratory investigates the neuroendocrine and neurochemical factors that regulate the secretion of anterior and posterior pituitary hormones that are involved in control of reproduction and energy balance. 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. Our current work is investigating the neuroendocrine basis for disruptions in reproduction and energy balance that occur in association with epilepsy.
Kristen Keefe  
Professor of Pharmacology and Toxicology  
Interim Dean of University of Utah College of Pharmacy

Email address: K.Keefe@utah.edu

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 their 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.
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 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

Email address: philip.moos@pharm.utah.edu

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 with an emphasis toward prevention. Research efforts are focused on cancer genomics, mechanisms of disease, and modifiers of cancer risk, with a particular emphasis on the role of inflammation in cancer risk.

Current work is primarily in three arenas: 1) elucidation of the role of select selenoproteins in cellular redox control and carcinogenesis, 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 area of research focuses on the selenoenzyme thioredoxin reductase. This enzyme has multiple roles in cellular redox regulation and viability, making it a potential target in cancer therapeutic strategies. However, our work and others have demonstrated that, as a sole target, inhibition rarely results in loss of viability. Instead, inhibition of thioredoxin reductase potentiates other therapeutics and therefore may be a useful target for new combination therapies for some cancer phenotypes.

The second area has been initiated in collaboration Dr. Bild. We have focused our efforts on identifying new agents for cancers without targeted therapies. To date, we have utilized a broad range of lung and breast cancer cells with known genetic and genomic character to screen unique chemical libraries for new potential therapeutics. 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’s group to understand the basis of the toxicology of materials with the potential for biomedical application.
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.
Roy M. Smeal
Research Assistant Professor of Pharmacology and Toxicology

Email address: roy.smeal@m.cc.utah.edu
Education and Training:
- B.S., 1997, Texas A&M University, College Station, TX. Electrical Engineering,
- Ph.D., 2004, University of Utah, Salt Lake City, UT. Bioengineering,
Research Interests:
Dr. Smeal is interested in utilizing animal models of epilepsy to help understand the function of affected brain regions both in normal and pathological conditions. Currently he is studying two different animal models: a chemically-induced rat model of epilepsy and a novel virus-induced mouse model of epilepsy, focusing on hippocampal function. In vitro electrophysiological, imaging, and pharmacological techniques are used to discover the synaptic and neuron-intrinsic changes that occur in the disease models. These changes, once correlated with the pathological state, can be used to infer about normal neural function and how this function might change in the pathological state. This experimental strategy has the dual benefit of utilizing animal models for the basic scientific endeavor of understanding normal brain function, while simultaneously advancing the goal of identifying potential drug targets to treat these diseases.
Misty D. Smith
Research Assistant Professor of Pharmacology and Toxicology

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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 and a senior scientist in the NIH-sponsored Anticonvulsant Drug Development (ADD) Program. In hopes of gaining a better understanding of the epilepsy, its comorbidities and their underlying mechanisms, Dr. Smith’s research utilizes a battery of acute and chronic preclinical seizure models, as well as, several non-epilepsy, in vivo behavioral models to characterize the therapeutic potential of investigation compounds for the treatment of epilepsy and its comorbidities. Furthermore, Dr. Smith uses isobolographic techniques to characterize the pharmacological nature of the interactions between adjunctive therapies to better understand potential combination drug therapies. The identification of novel compounds with broad or unique spectrums of therapeutic activity may help to better clarify the etiology of the epilepsy and its comorbidities and shed light on the most effective targets for their treatment. Additional related research interests include the role of neuropeptides and the role of cannabinoids, such as cannabidiol, in the treatment of epilepsy and its comorbidities.
John Veranth
Research Associate Professor of Pharmacology and Toxicology

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Website: http://www.cc.utah.edu/%7Ejmv2090/veranth_lab.htm

Education and Training:
- B.S., 1971 Massachusetts Institute of Technology, Cambridge, MA, Mechanical Engineering
- M.S., 1974 Massachusetts Institute of Technology, Cambridge, MA, Mechanical Engineering
- Ph.D., 1998 University of Utah, Chemical and Fuels Engineering

Research Interests:
Dr. Veranth’s interests center on building collaborative research programs that address the health effects of fine particles from combustion and other anthropogenic sources. This is an exciting area on the interface between combustion science, aerosol science, chemical engineering transport phenomena analysis, and the life sciences. The effect of ambient particles on sensitive populations is a complex issue of immediate social and economic concern where progress requires integrating the efforts of specialists in engineering, meteorology, biochemistry, and medicine. His current projects involve experimental and computational simulation studies of combustion aerosols, field studies of wind-blown dust in arid climates, and cell culture and whole animal studies of responses to transition metals in inorganic particles.
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 the basic mechanisms underlying epileptogenesis, seizure generation, and therapy-resistance to anticonvulsant drugs. To achieve these goals, we use electrophysiological, calcium imaging, pharmacological, behavioral, genetic, 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 functions 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, Karen Wilcox is also a Co-Investigator in the Anticonvulsant Drug Development (ADD) Program (Principal Investigator, H. Steve White, Ph.D) which determines the neuroprotection potential of proprietary investigational compounds through a contract with NINDS at the National Institutes of Health.
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

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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 identify 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, Pharmacoeconomics 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 involve communication and the poison control center and the epidemiology of poisoning. She has used statewide and national data resources to describe trends in poisoning. In the area of communication, her research interests include exploring the role of communication in adherence to poison center recommendations, developing communication training and communication assessment tools for poison control centers. She is also involved with a project to explore the feasibility of electronic information exchange between poison control centers and emergency departments as well as a project to explore salient issues related to the possibility of poison centers receiving inquiries via text messaging.
Hannah R. Fudin  
Assistant Professor (Clinical) of Pharmacotherapy

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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
Full Professor (Clinical)

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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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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.
Alisyn Hansen  
Assistant Professor of Pharmacotherapy  

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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.
Joanne LaFleur
Associate Professor of Pharmacotherapy

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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.
Carrie McAdam-Marx  
Associate Professor, Pharmacotherapy

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Education & Training:  
- B.S., 1988, University of Kansas, Lawrence KS, Pharmacy  
- M.S., 1991, University of Minnesota, Minneapolis, MN, Hospital Pharmacy  
- Ph.D., 2009, University of the Sciences, Philadelphia, PA, Health Policy  
- MSCI, 2013, University of Utah, Salt Lake City, UT, Clinical Investigation

Research Interests:  
Dr. McAdam Marx uses translational comparative effectiveness research and pharmacoeconomic techniques to evaluate the impact of collaborative drug therapy management in patients with type 2 diabetes. Specifically, she evaluates how pharmacist-led medication management, disease education, medication counseling, when delivered as part of a patient-centered primary care team, improves patient outcomes. She has been awarded grants from the University of Utah, the Pharmaceutical Research Manufacturers Association (PhRMA) Foundation, and the American Association of Colleges of Pharmacy (AACP) to perform this research. Her effectiveness research is evolving to include implementation studies to identify the feasibility and sustainability of collaborative drug therapy management programs in the primary care setting. She also conducts retrospective CER studies in diabetes pharmacotherapy to support patient and population level decision-making.
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.
1. First we are using translational research to study silver nanoparticles for treatment in chronic sinusitis. This discovery work is in collaboration with Dr. Grainger’s laboratory.
2. 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 CV endpoints from prevention and chronic disease management across the United States.
3. We are actively studying medication adherence across a number of different disease state venues.
4. We are identifying new roles for approved drugs in CV disease.
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

Email: nancy.nickman@pharm.utah.edu
Education & Training:
  • RPh License, 1982, Minnesota; 2011 Utah
  • B.S., 1982, University of Montana, Pharmacy
  • ASHP Accredited Administrative Residency 1982-1984, United
  • 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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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)

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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
PharmD, BCPS

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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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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:
Jim is interested in the interface of clinical care, public policy, and ethical reasoning.
Laura Shane-McWhorter
Pharm.D, BCPS, FASC, FAADE, CDE, BC-ADM, Professor (Clinical)

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Website: http://www.pharmacy.utah.edu/pharmacotherapy/faculty/Shane-McWhorter.htm

Education & Training:
- B.A., 1968, University of Texas at Austin, Psychology/Chemistry
- M.S., 1970, East Texas State University, Biology/Chemistry
- B.S., 1986, University of Utah, Pharmacy
- Pharm.D., 1988, University of Utah
- Residency, 1989, Salt Lake VA, Geriatrics

Research Interests:
Dr. Laura Shane-McWhorter is a clinical faculty member working with underserved patients at federally-qualified Community Health Centers (CHCs). The patients she works with have diabetes and many of its co-morbidities. She is a Certified Diabetes Educator and is Board Certified in Advanced Diabetes Management and helps to provide diabetes education and care and pharmacotherapy consults to providers at the CHCs. She worked as the Remote Care Coordinator on a telemonitoring project that tracked glucose and blood pressure in persons with uncontrolled diabetes and/or hypertension. Clinical education was a part of this project and patients experienced improvement in clinical outcomes and understanding of their disease state. She is also working with a Bioinformatics Team to assess interactions between dietary supplements and cardiology medications.
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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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

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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

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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  

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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 translational research regarding the optimal use of anticoagulation therapy in clinical practice. Dr. Witt is a founding member of the Warfarin Related Research Projects and Other Endeavors (WARPED) Consortium; an international group of pharmacists and physicians focused on answering research questions pertaining to warfarin therapy from the perspective of the practicing clinician. Examples of WARPED Consortium research projects include: Should warfarin therapy be resumed following gastrointestinal tract bleeding? What is the risk of thromboembolism associated with transiently low INR measurements during warfarin therapy? What is the risk of warfarin-associated bleeding following interruption of therapy for colonoscopy with polypectomy? Does nonadherence with INR monitoring increase the risk for bleeding and/or thromboembolism? Does warfarin therapy increase the risk for fatal intracranial hemorrhage? Dr. Witt has also conducted research establishing the clinical and economic value of clinical pharmacists as well as methods for improving the publication rate of pharmacy resident research projects.