UBRP Mentors for Summer 2022

Name	Email Address	Primary Department	Research Keywords	Research Description	Website
Richard Ablin	ablinrj@arizona.edu	Pathology	Cancer, Immunobiology	Development, diagnosis, progression, treatment cancer (particularly prostate)	https://medicine.arizona.edu/person/richard-j-ablin-phd-dsc
Mary Alt	malt@arizona.edu	Speech, Language, and Hearing Sciences	language disorder, intervention, statistical learning, bilingual, learning	I study how people learn words and the concepts associated with them. This includes people with and without language disorders, people of different ages (although I do have a specialty in young children), and people from different linguistic backgrounds (bilingual). I am interested in translating principles of learning and understanding of cognitive principles (e.g., memory) from fields like cognitive science into applied treatments for those with disorders and into general education design to improve learning and achievement.	https://sites.google.com/email.arizona.edu/l4lab/home
Jessica Andrews-Hanna	jandrewshanna@email.arizona.edu	Psychology	memory, thought, cognition, neuroscience, depression, Alzheimer's disease	The research conducted in the Neuroscience of Emotion and Thought (NET) Lab, directed by Dr. Jessica Andrews-Hanna, is centered on understanding the mysteries of our inner mental lives – the thoughts, memories, feelings and emotions that make us unique as individuals. An ultimate goal of our lab is to help individuals harness the beneficial aspects of internally-guided cognition and live happier, healthier lives.	http://www.netlabgroup.com/
Julie Armin	jarmin@arizona.edu	Family and Community Medicine	cancer disparities, health behavior, health systems	My research program is broadly focused on addressing cancer disparities among historically marginalized populations. I conduct community-informed and based research with Latinx communities and people with disabilities.	https://www.fcm.arizona.edu/profile/julie-s-armin-phd
A. Elizabeth (Betsy) Arnold	arnold@ag.arizona.edu	School of Plant Sciences	Fungi, microbial ecology, evolutionary biology, biodiversity, agriculture, genetics	We are a diverse group of researchers and educators with interests in the ecology, evolution, and potential applications of symbioses. Our special focus is on the fungal portion of plant microbiomes, with particular interest in foliar endophytic fungi and the soilborne fungi that interact with seeds -- but our interests also include mycorrhizal fungi, insect-associated fungi, and fungal-bacterial interactions. Our field sites range from the Arctic to tropical rainforests, and our skills encompass traditional microbiology, field ecology, phylogenetics, and genomics. We are increasingly interested in the applications of fungal symbionts of plants in smart agriculture. Our home is in the School of Plant Sciences, UA College of Agriculture and Life Sciences -- but we have collaborators and connections across UA's interdisciplinary campus community and beyond.	http://www.arnoldlab.net/
Alex Badyaev	abadyaev@arizona.edu	Ecology and Evolutionary Biology	evolutionary ecology, development, behavior, life history, genetics, biochemistry	In our integrative research group, we study evolution and development of biological diversity on many levels of organization -- from molecular genetics, physiological and developmental mechanisms, to behavioral and ecological dimensions. We work primarily on birds and mammals and benefit tremendously from long-term field study sites we have established in diverse ecosystems of southern Arizona and across western North America.	http://www.u.arizona.edu/~abadyaev/
E. Fiona Bailey	ebailey@arizona.edu	Physiology	cardiovascular, autonomic, respiratory, clinical trial	The Arizona Respiratory Neurophysiology laboratory (ARNL) research focus is respiratory control and specifically, how breathing may be used to regulate blood pressure. Beginning in 2013, we have spearheaded research using a form of respiratory exercise training known as Inspiratory Muscle Training (IMT) demonstrating its potential to lower blood pressure and improve cardiovascular health in older adults with hypertension and obstructive sleep apnea. Our work is supported by NIH/National Institute on Aging.	https://baileylaboratory.wixsite.com/my-site-2
David Baltrus	baltrus@email.arizona.edu	School of Plant Sciences	Evolution, Bacteria, Genetics, Genomics, Host-Microbe	The Baltrus lab investigates the genetic and genomic basis of interactions between bacteria and other organisms. We are interested in how the pathways underlying these interactions evolve over time and how these interactions are shaped by genetic and environmental contexts.	http://www.baltruslab.com/
Christopher Banek	cbanek@arizona.edu	Physiology	Physiology, neuroscience, surgery, nephrology, medicine	We are an integrative physiology laboratory, studying the nexus between the heart, brain, and kidneys in the regulation of blood pressure. Our lab is primarily focused on elucidating the effects of renal denervation (RDNx), a method that interrupts nerve signaling to and from the kidney, on chronic blood pressure and kidney function in models of cardiovascular and kidney disease. Further study and refinement of RDNx can lead to the next generation of high blood pressure and kidney disease treatment, beyond or complementary to conventional drug or lifestyle intervention.	https://physiology.arizona.edu/lab-page/banek-lab
Carol Barnes	carol@nsma.arizona.edu	Psychology	behavior, aging, memory	The Barnes Lab research program involves behavioral, electrophysiological and molecular biological approaches to the study of young and aged rodents and non-human primates. This work provides a basis for understanding the basic mechanisms of normal aging in the brain and sets a background against which it is possible to assess the effects of pathological changes such as Alzheimer's disease.	https://psychology.arizona.edu/users/carol-barnes
Jennifer Barton	barton@email.arizona.edu	Biomedical Engineering	imaging, cancer detection, fluorescence, endoscopes, optical	I work on developing novel optical imaging techniques for early detection of cancer. This often involves developing miniature endoscopes to access the tissue of interest. Projects in the lab involve optical design, mechanical design, instrumentation, and software development. We work with human specimens, in vivo human and animal studies.	http://bmeoptics.engr.arizona.edu/

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Paloma Beamer	pbeamer@email.arizona.edu	Environmental Health Sciences	exposure science, environmental justice, children's health, health disparities	Dr. Beamer uses field sampling, GIS, computer modeling and laboratory techniques in her research. She has led multiple studies to collect of multi-media exposure samples for metals, pesticides and VOCs with minority and rural populations. She has also developed an exposure and dose simulation model for children's exposures to pesticides, a model that quantifies the transport of outdoor contaminants to the home environment, and a model focused on transfer of viruses via hand contacts. Dr. Beamer is also an expert in the collection and quantification of key exposure factors aimed at improving risk assessment and is funded by EPA to gather data on children's dust and soil ingestion. She is also funded by NIH for a to conduct a clinical trial to assess the effectiveness of a promotoras intervention at reducing exposures in small businesses like auto repair shops or beauty salons. During the COVID-19 pandemic that project has been expanded to include a "tele-promotora" program and to understand how work practices and risk perceptions have changed during the pandemic. Her lab is participating in a binational birth cohort to assess the role of environmental microbiome in drinking water and house dust on development of childhood respiratory diseases.	https://www.publichealth.arizona.edu/directory/paloma-beamer
Mark Beilstein	mbeilstein@arizona.edu	School of Plant Sciences	evolution, phylogeny, cell signaling	My lab is interested in the evolution of mechanisms responsible for cell-cell communication in plants. We use species in the plant family Brassicaceae to decipher the cell signaling system that allows successful fertilization. We routinely genetically modify plants, including the use of CRISPR-Cas systems to mutate or differentially regulate genes of interest.	https://cals.arizona.edu/spls/content/mark
Martha Bhattacharya	marthab1@arizona.edu	Neuroscience	neurodegeneration, autophagy, cell biology, genetics, behavior	Understanding early cellular events common to many neurodegenerative diseases through the lens of genetics. We use cell culture, mice, and Drosophila and do imaging and biochemical assays.	https://marthabhattacharya.lab.arizona.edu/
Joey Blankinship	jblankinship@arizona.edu	Environmental Science	soil ecology, plant-soil interactions, desert agriculture, ecological restoration, carbon sequestration, dust prediction and mitigation	My team's current research tackles grand environmental and agricultural challenges in arid and semi-arid regions of the world that are linked to soil health, including dust mitigation, ecological restoration, soil carbon sequestration, and improving the efficiency of water and fertilizer use in croplands.	https://profiles.arizona.edu/person/jblankinship
Timothy Bolger	tbolger@email.arizona.edu	Molecular and Cellular Biology	RNA, translation, yeast, genetics, biochemistry, cancer	Stress is a part of life, even on the cellular level. To survive and adapt to stresses such as nutrient deprivation or temperature shock, cells have to alter gene expression, especially protein translation, the most energy-intensive process in cells. Changes in the translational stress response have been implicated in multiple human pathologies, including cancer and aging. In the Bolger lab, we study translation regulation with a major emphasis on how it is altered during different stresses. Specifically, we have focused on the DEAD-box RNA helicase family, which is critical in many steps of gene expression. Current projects in the lab are uncovering the mechanisms underlying the function and regulation of Ded1, a helicase that plays important roles in translation, as well as the role of mutations in the Ded1 ortholog in medulloblastoma, a pediatric brain cancer.	http://mcb2.arizona.edu/tbolger/Lab_site/Bolger_Lab_Home.html
Heidi Brown	heidibrown@arizona.edu	Epidemiology and Biostatistics	epidemiology, data analysis, risk mapping	My research interests are the intersection of environment, hosts (human and other animal) and disease. I use data analysis tools to identify environmentally driven risk of disease. While my interests are primarily in vector borne and zoonotic disease, I also work on infectious causes of cancers and climate related diseases (such as heat related illness). I use mapping techniques to visualize the analyses I complete.	https://brownlab.arizona.edu/
Judith Brown	jbrown@ag.arizona.edu	School of Plant Sciences	emerging plant virus diseases, insect vector-pathogen interactions biology, molecular pathology, next generation sequencing/discovery, phylogenomics, RNA interference	We work on emerging plant viruses transmitted by insect vectors in annual and perennial agricultural crops such as cotton, citrus, cacao, tomato, beans, among others. We use cutting edge molecular and omics tools for detection, characterization, and 'discovery' of new viral pathogens and fastidious bacteria. We also study insect vector-pathogen interactions using RNA interference (dsRNA) to knock down insect genes essential for facilitating the transmission pathway, both to illuminate the transmission pathway itself, and for potential mitigation either resulting in mortality or reduced transmission. Recently we initiated a project to study seedborne viruses in legumes, with an emphasis on common bean and tepary bean, the latter which is native to the southern US and Mexico, and has been cultivated as a source of superior protein and nutrition by the indigenous peoples of north and central America for hundreds of years. We are interested on the potential interactions between biotic stress resulting from virus infection and drought tolerance in tepary bean.	https://cals.arizona.edu/spls/content/judith
Michael Brown	mfbrown@u.arizona.edu	Chemistry and Biochemistry	biomembranes, membrane proteins. GPCRs, rhodopsin, vision	The molecular basis of visual excitation is investigated by studies of rhodopsin in a membrane lipid environment. A combination of biochemical techniques together with spectrophotometry is used to study how the membrane lipids and water govern the activation of the visual photoreceptor and its interactions with downstream effector proteins.	https://cbc.arizona.edu/faculty/michael-brown
Ross Buchan	rbuchan@email.arizona.edu	Molecular and Cellular Biology	RNA, Protein, Genetics, Stress, Biomolecular Condensates	My lab studies how eukaryotic cells respond to changing environments such as stress, by inducing the assembly of mRNA-protein cytoplasmic foci called stress granules and P-bodies. These liquid-like organelles are implicated in regulating mRNA function, cell signaling and other cellular processes, and aid in cell survival under stress. However, persistent or aberrant assembly of stress granules in particular is linked to neurodegenerative diseases and cancer. Recently, our lab has also become interested in a novel mechanism by which cells degrade a protein called TDP-43, whose mislocalization and accumulation is thought to be pathogenic in amyotrophic lateral sclerosis and other neurodegenerative diseases. We use yeast and human cell line model systems, and frequently use genetic, biochemical and microscopy methods.	http://mcb2.arizona.edu/buchan/

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Haijiang Cai	haijiangcai@arizona.edu	Neuroscience	Neuroscience, Neural circuits, animal behavior, anorexia, optogenetics, electrophysiology	We are studying the neural circuits of animal behaviors in health and disease, with a focus on understanding how the neural circuits regulate eating and emotional behaviors such as fear, anxiety, and depression. We use multidisciplinary approaches including transgenic mice, optogenetics, chemogenetics, in vivo calcium imaging, behavioral assays, brain slice electrophysiology, virus and non-virus based neuronal tracing, stereotaxic injection and immunohistology,	https://neurosci.arizona.edu/person/haijiang-cai-phd
Andrew Capaldi	capaldi@email.arizona.edu	Molecular and Cellular Biology	Cell Signaling, Cell growth control, systems biology	We are interested in how cells regulate their growth and metabolism in response to environmental cues, such as nutrients, stresses and hormones. This works centers around studying the signaling through the Target of Rapamycin kinase Complex I (TORC1) and cAMP dependent protein kinase (PKA) pathways. We are especially interested in determining how signals are transmitted to these kinases, how they complexes process that information and then act on downstream proteins to alter the cell function. This work requires the use of Genetics, Systems Biology and Biochemical approaches.	http://mcb2.arizona.edu/capaldilab/
Paul Carini	paulcarini@arizona.edu	Environmental Science	microbiology, microbial physiology, genomics, genetics, soil, marine	We apply system biology approaches of environmental bacteria to understand how microbes in soil, marine, and host associated environments function. We are particularly interested in understanding the genetic mechanisms of how microbes persist in nutrient sparse environments.	https://carinilab.com/
Yves Carriere	ycarrier@ag.arizona.edu	Entomology	insect, ecology	We work on management of resistance to transgenic Bt crops and development of integrated pest management for insect pests.	https://www.cals.arizona.edu/ento/content/yves-carri%C3%A8re
Eugene Chang	echang@arizona.edu	Otolaryngology	Molecular biology of the airway	Our lab focuses on the molecular response of airway epithelial cells to pathogens responsible for chronic sinusitis	https://changlab.medicine.arizona.edu/
Nathan Cherrington	cherrington@pharmacy.arizona.edu	Pharmacology and Toxicology	Drug Transport, Drug Metabolism, Adverse Drug Reactions	Current research interests include the molecular mechanisms of liver toxicity and regulation of drug metabolizing enzymes and transporters. Major emphasis has been placed on the role and regulation of these enzymes and transporters during fatty liver disease and cholestasis. Additionally, we are interested in the potential use of endogenous drug transporters to “piggyback” drug therapies across the blood-testis barrier. Our two major research projects include: •Altered Drug Metabolism and Disposition in NAFLD •Xenobiotic Transporters at the Blood-Testis Barrier	https://www.pharmacy.arizona.edu/directory/profile/nathan-cherrington-phd-ats
Ying-hui Chou	yinghuichou@email.arizona.edu	Psychology	transcranial magnetic stimulation (TMS), magnetic resonance imaging (MRI), Alzheimer's disease, mild cognitive impairment, cognitive aging	My research has focused primarily on the cognitive and clinical neuroscience of aging and neurodegenerative disorders. Within this framework, my laboratory is particularly interested in integrating magnetic resonance imaging (MRI) and transcranial magnetic stimulation (TMS) techniques to 1) develop MRI-guided therapeutic TMS protocols and 2) explore TMS-derived and image-based biomarkers for early diagnosis and prediction of therapeutic outcomes for individuals with neurodegenerative disorders. I am the Director of Brain Imaging and TMS Laboratory and leading an NIH-funded R01 clinical trial to test MRI-guided hippocampal TMS on memory function in patients with mild cognitive impairment. I teach undergraduate and graduate courses such as cognitive neuroscience, brain rehabilitation, and brain connectivity in the Department of Psychology.	https://yinghuichou.wixsite.com/tmslab
Jared Churko	jchurko@arizona.edu	Cellular and Molecular Medicine	Stem cells, genetic engineering, bioinformatics, tissue engineering	Our lab generates iPSCs from patients with cardiovascular disease. We correct the underlying mutation using Crispr/Cas9 and model heart diseases using bioengineering approaches. Finally, we use various omics modalities to interrogate the disease molecular mechanism.	https://heartresearch.us/
Brett Colson	bcolson@arizona.edu	Cellular and Molecular Medicine	Cardiovascular physiology, biophysics, molecular biology, structure-function, drug screening, genetic disease, muscle, fluorescence	The Colson lab aims to decipher the structural basis for cardiac and skeletal muscle contraction at the molecular level in healthy physiology and disease. We study human proteins of muscle cells using biophysical methods such as fluorescence. Our studies include key variables such as Ca2+ and ATP in contraction, phosphorylation during stress, and mutations that cause genetic disease. We aim to understand how contraction works at the molecular level, what goes awry in disease, and identify new therapies to treat cardiac and skeletal muscle diseases.	https://cmm.arizona.edu/profile/brett-colson-phd-0
Sally Dickinson	sdickinson@uacc.arizona.edu	Pharmacology	Cancer, skin, UV light, prevention, TLR4, PD-L1	My lab is interested in studying how UV light causes stress signaling in skin cells, and how this signaling can be blocked or harnessed in order to prevent skin cancer. We are a translational lab that uses cell culture and mouse models to try to find new targets for skin cancer prevention and help move new agents into human clinical trials. Our current main focuses are the innate immune receptor TLR4 and the immune checkpoint inhibitor PD-L1, both of which are upregulated in skin cancer, and both of which we have shown to respond to UV in the skin and are targetable by small molecule pharmacological agents.	https://cancercenter.arizona.edu/person/sally-e-dickinson-phd
Frank Duca	faduca@email.arizona.edu	Animal and Comparative Biomedical Sciences	obesity, diabetes, gut microbiome, gut microbiota, intestine, metabolic disease	The Duca lab examines the role of the gastrointestinal tract in the development of metabolic disease. Our research focuses on how the gut can sense ingested nutrients and signal to the brain to regulate energy and glucose homeostasis. We are interested in how different diets, like those high in fat or sugar or fiber can impact these gut-brain signaling pathways. Additionally, we are interested in how the gut microbiome contributes to the development of obesity and diabetes, and how specific bacteria or metabolites produced by bacteria can influence energy and glucose homeostasis at the level of the intestine, liver, and brain.	https://profiles.arizona.edu/person/faduca
Renee Duckworth	rad3@arizona.edu	Ecology and Evolutionary Biology	integrative biology, evolution, ecology, behavior	Current projects in my lab include 1) eco-evolutionary feedbacks between behavioral change and population density, 2) investigating proximate epigenetic basis of maternal effects on dispersal strategies 3) investigating neuroendocrine mechanisms and developmental constraints on personality traits 4) comparative studies across vertebrates on evolution of traits that affect species diversification.	http://www.u.arizona.edu/~rad3/
Jamie Edgin	jedgin@email.arizona.edu	Psychology	development, disability, sleep, memory, autism, Down syndrome	I study sleep, memory, and dreams in sleep disorders, particularly developmental and learning disabilities (Down syndrome, autism, and ADHD). Current studies include the relationship between sleep and creativity and exercise, memory, and sleep.	https://mddlab.faculty.arizona.edu/

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Torsten Falk	tfalk@arizona.edu	Neurology	Translational research, Parkinson's disease, rodents	Our research focuses on cellular and rodent models to test 1) novel pharmacological treatments for L-DOPA-induced dyskinesias, a major side effect of Parkinson's disease (PD) treatment, 2) novel neuroprotective (growth factor mediated) gene therapy approaches to treat PD, and 3) development of glycopeptides for the treatment of PD.	https://profiles.arizona.edu/person/tfalk
Bentley Fane	bfane@email.arizona.edu	School of Plant Sciences	virology, genetics, biochemistry	The assembly of viruses inside infected cells involves numerous protein-protein interactions. These interactions are often orchestrated by scaffolding proteins. Analogous to scaffoldings used in building construction, these proteins ensure the integrity and efficiency of progeny formation but are not found in the final product. After the capsid is assembled, the viral genome must be condensed to concentrations approaching 500 mg/ml to fit inside it. Once the virus is assembled, it must transport its genetic material to the next cell to be infected. The broad objective of our research program is to elucidate the molecular mechanisms involved in scaffolding-mediated assembly, single-stranded DNA packaging, and the transportation of the viral genome through a specialized DNA-translocating conduit when infecting the next cell.	https://immunobiology.arizona.edu/profile/bentley-fane-phd
Jean-Marc Fellous	Fellous@arizona.edu	Psychology	Neuroscience, brain, memory, emotion	In vivo behaving neuroscience in rats. Interests are in complex spatial navigation, decision making, emotions. We use experimental and computational techniques.	http://amygdala.psychdept.arizona.edu/lab.html
Ralph Fregosi	fregosi@u.arizona.edu	Physiology	neurophysiology; respiratory physiology; nicotine; brain development; motor neurons; synaptic transmission	We study how the motor neurons that control the muscles of breathing develop, and how perinatal exposure to neurotoxins alters their normal development. The neurotoxin currently under study is nicotine. Our experimental focus is on alterations in the motor neuron biophysical properties, synaptic transmission, neurotransmitter receptor expression and gene expression. Mainstay techniques include whole cell patch clamp electrophysiology, measures of breathing in awake animals, extracellular recording of motor nerves, electromyography, immunocytochemistry, pharmacology and RNA sequencing.	https://physiological-sciences.arizona.edu/people-0/faculty-members/training-faculty
Francine Gachupin	fcgachupin@email.arizona.edu	Family and Community Medicine	American Indian, behavior intervention, obesity, diabetes, dyad	The American Indian Youth Wellness Camp focuses on youth aged 10-15 years old and their primary parent/caregiver towards a healthy lifestyle. The six month intervention focuses on physical activity, nutrition, mental wellness, all within a cultural context. Assessments are completed at baseline, 3 months and 6 months to assess changes. Due to COVID-19, the intervention is delivered as 'Camp in a Box.'	https://www.fcm.arizona.edu/outreach/american-indian-youth-wellness-initiative
Rachel Gallery	rgallery@arizona.edu	School of Natural Resources and the Environment	Aridlands, Ecology, Fungi, Microbes, Natural Resources, Soil, Watershed	Plant-microbe interactions and feedbacks are important, but cryptic components of how ecosystems function and respond to change. Microbes play a significant role structuring plant communities through positive and negative interactions, and the diversity of soil microbiota controls the processes governing biogeochemical cycling in soils. As we consider the threat of species loss and how plant communities will continue to shift under rapidly altered temperature and precipitation regimes, understanding these feedbacks emerges as a critical focus for plant community ecology, ecosystem science, and conservation ecology. Working across a range of ecosystems from lowland Neotropical and high elevation conifer forests to semi-arid grasslands and tropical alpine wetlands, our research group combines ecological experiments, microbiological techniques, and contemporary genetic and metagenomic tools to develop hypotheses to test the effects of plant-microbe interactions on plant community richness and species abundance, understand how environmental shifts will alter these interactions, and accurately predict the subsequent impacts on ecosystem function.	http://rachelgallery.arizona.edu
Carol Gregorio	gregorio@arizona.edu	Cellular and Molecular Medicine	cell biology, cardiovascular science, heart disease	Our goal is to identify the molecular components and pathways that are responsible for the contraction (beating) of the heart. We take the approach of studying human mutations that result in heart and skeletal muscle disease - and then work backwards to identify the mechanisms that are responsible for disease phenotypes.	https://mcrp.med.arizona.edu/research_gregorio_overview.html
Matt Grilli	Mdgrilli@arizona.edu	Psychology	Memory, aging	We study cognitive and brain aging, amnesia, and the relationship between memory and identity. We use cognitive, neuropsychological, and neuroimaging (MRI) methods.	https://mdgrilli.faculty.arizona.edu/
Ryan Gutenkunst	rgutenk@arizona.edu	Molecular and Cellular Biology	population genetics, computational biology, genetics, evolution	We study the function and evolution of the complex molecular networks that comprise life. To do so, we integrate computational population genomics, bioinformatics, and molecular evolution. We also prepare group members for fulfilling professional lives. Our group is interdisciplinary and collaborative, with an atmosphere that promotes creativity.	http://gutengroup.mcb.arizona.edu/

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Michael Hammer	mfh@email.arizona.edu	Neurology	epilepsy, transcriptome, mouse model, rare disease registry	Currently I am deeply committed to translational research in epilepsy and brain disorders, making use of more than 25 years of experience innovating in human genetics, clinical genomics, transcriptomics, and systems biology approaches. A turning point in my research career began with my team's discovery of new gene implicated in pediatric epilepsy. In one of the first applications of whole genome sequencing for rare variant identification, my research team discovered the de novo SCN8A mutation that caused my daughter's epilepsy. We subsequently established mouse models with the pathogenic variant discovered in my daughter, and in 2018 an induced pluripotent cell line was established from my daughter's 22-year-old cord blood sample in the laboratory of Dr. Lalitha Madhavan. This cell line now forms the basis of translational research making use of both the mouse and the human models. A common theme across much of the mouse and human work is a systems biology approach that links transcriptomic alterations to physiological processes that play a role in different stages of disease development, and the use of pathway enrichment analyses to identify disease modifying physiological pathways. This work points to the importance of mitochondrial ROS, peripheral cytoskeletal remodeling, and the role of blood-brain-barrier disruption in the pathophysiology of neurologic disease. I am also passionate about finding alternative therapies targeting key cellular pathways that are altered in epileptogenesis and testing them in these models. To fully describe the human disease spectrum, I established an online registry to collect data from the now >500 families around the world known to have of SCN8A epilepsy and related disorders. I have also worked and published on modifier gene variants affecting outcome in childhood epilepsy, and changes in brain gene expression in an SCN8A mouse model.	https://www.hammerlabaz.com/
Nancy Horton	nhorton@email.arizona.edu	Molecular and Cellular Biology	structural biology, evolution, biochemistry, enzyme regulation, protein science, mechanisms of disease	The Horton Lab uses a combination of biochemical and biophysical methods to investigate various topics of interest including mechanisms of autoimmune disease, host-viral interactions, and enzyme regulation. Methods include x-ray crystallography, analytical ultracentrifugation, rapid enzyme kinetics methods, fluorescence, thermodynamics, molecular modeling, and cryo-electron microscopy.	https://sites.google.com/view/horton-lab/home
Natalia Ignatenko	nai@email.arizona.edu	Cellular and Molecular Medicine	colorectal cancer, proteases, polyamines	My research is focused on the molecular aspects of colon carcinogenesis downstream of the major cancer-causing genes, mutant APC tumor suppressor gene, and K-RAS oncogene.	https://cmm.arizona.edu/profile/natalia-ignatenko-phd
John Jewett	jjewett@email.arizona.edu	Chemistry and Biochemistry	Bioorganic chemistry	We develop new reactions and probes to interrogate challenging biological environments, from viruses to mosquitos.	https://sites.google.com/site/jcjewettlab
Dongkyun Kang	dkkang@arizona.edu	Optical Sciences	optical microscopy, point-of-care diagnosis, cancer diagnosis, low-resource setting research	The Translational Optical Imaging lab develops low-cost optical imaging devices for medical applications in low-resource settings. Our low-cost microscopy devices have been used for imaging skin and cervix in Uganda. Currently, our research is focused on eye imaging, anal cancer diagnosis, and melanoma diagnosis.	https://wp.optics.arizona.edu/dkang/
Emmanuel Katsanis	katsanis@peds.arizona.edu	Pediatrics	hematopoietic cell transplantation, graft versus leukemia, tumor immunology, transplant immunology, cancer vaccines	My research areas are cancer immunology-immunotherapy and hematopoietic stem cell transplantation. I have a particular interest in haploidentical hematopoietic cell transplantation, cell therapies, and immumodulatory agents. Current work in my laboratory is focused on pre- and post-transplant immune modulation by selective chemotherapeutic agents and their effects on immune reconstitution, viral reactivation, graft-versus-host disease and graft-versus-tumor effects and in development of cancer vaccines.	https://cancercenter.arizona.edu/person/emmanuel-katsanis-md
Aneta Kielar	akielar@email.arizona.edu	Speech, Language, and Hearing Sciences	cognitive neuroscience, neuroimaging, dementia, neurogenic language disorders, neuromodulation	My research program is centered on investigating the neurobiology of healthy language system, and changes in cognitive and language processing associated with stroke and neurological disorders. My interests include incorporating cognitive measures and multimodal neuroimaging methods, with a goal to understand the relationship between language and other aspects of cognition, as well as the neural dynamics related to brain damage, resilience, and recovery. My research efforts are directed towards identifying factors which affect language comprehension and production, and how these change with development and are influenced by aging, stroke, brain injury, and neurodegenerative disorders, including Primary Progressive Aphasia (PPA) and Alzheimer's disease (AD). I study language processing at the multiple levels, using behavioral experiments and both structural (DWI, lesion-symptom mapping, voxel-based morphometry) and functional neuroimaging (fMRI, EEG, MEG). In addition, I am interested in neuroplasticity and application of noninvasive brain stimulation techniques to enhance treatment of aphasia and dementia. The long-term goal of my research is to understand the cognitive and neural processes that support recovery of cognitive and language functions after stroke.	https://akielar.faculty.arizona.edu/content/3
Minkyu Kim	minkyukim@arizona.edu	Materials Science and Engineering	Biopolymer, Protein Design, Biomolecular Engineering, Self-assembly, Biomaterials	The overarching goal of the Kim research group is to develop functional biopolymer materials for targeted applications in healthcare, environmental safety, and national defense. The Kim research group is currently developing (a) mechanically responsive soft materials that capture performances of living materials (e.g. reversible deformability red blood cells, and strength and toughness of muscle), (b) biopolymer materials to mitigate various microbial infections and promote wound healing, and (c) biopolymer coating on metallic implant for enhanced interactions with skin and soft tissue.	https://kim.lab.arizona.edu/

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Michael Kuhns	mkuhns@email.arizona.edu	Immunobiology	Immunology, immunotherapy, T cell activation, cancer, autoimmunity	My lab is engaged in both basic research and biomimetic immune engineering. Our basic research is broadly focused on increasing our understanding of how T cell fate decisions are made (e.g. development, activation, differentiation, effector functions), while our biomimetic engineering projects draw upon our knowledge of the multi-subunit receptor complexes that drive these fate decisions to develop novel immunotherapeutic reagents that can influence T cell responses to vaccines or tumors, prevent transplant rejection, or attenuate autoimmunity.	https://immunobiology.arizona.edu/research/kuhns-lab
Paul Langlais	langlais@deptofmed.arizona.edu	Endocrinology	Protein signal transduction, Type 2 diabetes, Insulin-stimulated glucose transport, Microtubule and actin dynamics, Vesicle trafficking, Cell Biology	In the Langlais Lab, we figure out how insulin stimulates glucose transport into muscle and fat, a mechanism that is dysfunctional in type 2 diabetes. Specifically, we first discover new proteins involved in this process, and second, using cell biology techniques combined with quantitative proteomics approaches, we characterize the exact roles of these proteins in insulin action. Lately, we have become obsessed with figuring out how proteins control microtubules and actin within the context of insulin signaling. Both of these cytoskeletal elements are crucial for proper insulin-stimulated glucose transport, but, little is known how they are controlled and how they cooperate. So, we explore the unknown, with the hope being to eventually help people get better. Our mantra is simple: you can't fix it till you know how it works.	https://langlaislab.medicine.arizona.edu/
Daniel Latt	dlatt@arizona.edu	Orthopedic Surgery	Orthopedic Biomechanics, Flatfoot, Gait, Functional Imaging, Ultrasound, Outcomes	My lab focuses on studying degenerative disease of the ligaments and tendons of the foot using a number of biomechanical techniques including: human movement analysis, strain based ultrasound imaging, exvivo (cadaveric) modelling, patient reported outcomes, and computational modelling.	www.linkedin.com/in/danlatt
Kevin Lin	klin@math.arizona.edu	Mathematics	Nonlinear dynamics & chaos, data driven modeling, computational neuroscience	I use (and sometimes develop) mathematical and computational tools to study the dynamics of complex physical and biological systems. Increasing, my work involves data-informed and data-driven modeling. I am especially interested in computational neuroscience, i.e., the study of information processing in the brain.	https://www.math.arizona.edu/~klin
Jianqin Lu	lu6@arizona.edu	Pharmacology and Toxicology	Drug delivery, nanomedicine, cancer immunotherapy	The Lu research laboratory strives to develop innovative, safe, and efficacious therapeutics at the interface of drug delivery, synthetic chemistry, pharmaceutics, nanotechnology, and tumor immunology to address the pressing unmet needs in current cancer and other diseases therapy and prevention, particularly in the emerging field of combination immunochemotherapy.	https://jianqinlu.wixsite.com/jianqinlu
Lalitha Madhavan	lmadhavan@email.arizona.edu	Neurology	Neuroscience, stem cells, neurodegeneration	Mechanisms of Aging - particularly stem cell aging. Mechanisms underlying Parkinson's disease using rodent models and human induced pluripotent stem cells.	https://madhavanlab.medicine.arizona.edu/
Michael Marty	mtmarty@arizona.edu	Chemistry and Biochemistry	Biochemistry, lipid membranes, analytical chemistry, mass spectrometry	Research in the Marty Lab centers on developing new technologies to study interactions at biological membranes, with a special focus on combining lipoprotein nanodiscs and native mass spectrometry. One aspect of his research focuses on characterizing membrane protein-protein and membrane protein-lipid interactions. Membrane proteins are important drug targets, and the Marty lab seeks to understand how lipids influence membrane proteins important in a range of diseases.	https://marty.lab.arizona.edu/
Joanna Masel	masel@email.arizona.edu	Ecology & Evolutionary Biology	evolutionary theory, protein evolution, COVID-19 risk analysis	I run a "dry lab" doing a mixture of mathematical, simulation, and bioinformatic work. We study a range of topics including the interplay between relative and absolute forms of competition, the load posed by deleterious mutations, the birth of new proteins and their subsequent long-term evolutionary trajectories, the evolution of error rates in molecular processes, and optimizing test and quarantine regimes for COVID-19.	http://www.eebweb.arizona.edu/faculty/masel/people/joanna/
Brian McKay	bsmckay@eyes.arizona.edu	Ophthalmology and Vision Science	retina, blindness, RPE, pigment, age-related macular degeneration, AMD	Age-related macular degeneration (AMD) is the leading cause of irreversible blindness. AMD occurs when the retinal support tissue, the retinal pigment epithelium (RPE), fails and is lost with aging. We discovered that a specific receptor on the RPE controls the support function of the RPE, and have developed strategies to augment RPE function in support of the retina. In the McKay lab we study the RPE cells to identify strategies to bolster RPE function and survival. Our models include primary cell isolates and protein chemistry methods.	https://eyes.arizona.edu/research/mckay-lab
Laura Miller	lauram9@math.arizona.edu	Mathematics	biomechanics, mathematical biology, marine biology	The focus of my research program is to mathematical models to reveal the developmental and evolutionary significance of fluid dynamic forces in biological systems. In particular, my research group has focused on how organisms have evolved to increase fluid transport and locomotion efficiency, the way fluid forces constrain biological design, and the influence of fluid scaling effects during animal development. Some of our work has focused on developing mathematical models and experiments to describe the pumping mechanics of embryonic and tubular hearts, fluid transport through biological filtering layers, and the aerodynamics of flight in the smallest insects. To study these problems, we have used a three-pronged approach that consists of measurements of morphology and kinematics in actual animals, the use of physical models to measure forces and flow velocities, and numerical simulations to understand the fluid dynamics of systems that are difficult to approach experimentally.	https://sites.google.com/site/swimflypump/home?authuser=0
Oliver Monti	monti@arizona.edu	Chemistry and Biochemistry	Renewable energy, solar cells, novel low-power electronics, single molecule electronics	In LabMonti, we create the future of electronics: We make circuits from single molecules, at the absolute limit of what can be imagined; we find better ways to harvest sunlight to produce power, and we invent new ways to store and process information that have a sustainable energy use footprint for a green future.	https://sites.google.com/view/labmontiquantum
Jon Njardarson	njardars@arizona.edu	Chemistry and Biochemistry	organic synthesis - new materials for optical imaging - ALS - Parkinson's	Students in my laboratory are trained to become expert synthetic organic chemists capable of building/making ANY organic architecture. Our collaborative efforts focus on using synthetic mastery to make molecules for making new materials and on the drug discovery front towards ALS and Parkinson's as examples.	https://njardarson.lab.arizona.edu/

Name	Email Address	Primary Department	Research Keywords	Research Description	Website
Ravi Palanivelu	rpalaniv@email.arizona.edu	School of Plant Sciences	development, genomics, genetics, cell biology,	Our lab is using plant reproduction to understand the genetic mechanisms that mediate cell-cell interactions in plants. Two specific projects that build on these efforts include: 1. Generating heat tolerant tomato varieties using contemporary genomic approaches, and 2. Overcoming reproductive hybridization barriers in Brassicaceae model plants so that we can generate tools to break species barrier and generate novel hybrids.	https://ag.arizona.edu/research/ravilab/
Jeanne Pemberton	pembertn@email.arizona.edu	Chemistry and Biochemistry	biosurfactants and related glycolipids; carbohydrate-based drug delivery materials	Glycolipids represent a wide range of molecules containing carbohydrates that can be used for many functional purposes. The Pemberton laboratory makes advanced functional materials from glycolipids and characterizes their properties using a wide array of instrumental techniques (NMR spectroscopy, optical spectroscopies, mass spectrometry, chromatography, light scattering, electron microscopy, thermal methods, rheometry, etc.)	https://cbc.arizona.edu/faculty/jeanne-e-pemberton
Elena Plante	eplante@arizona.edu	Speech, Language, and Hearing Sciences	language, behavior, learning, developmental language disorder	The work of the lab centers on the identification and behavioral treatment of children and adults who have a developmental language disorder. This disorder affects the ability of individuals to acquire and use language for listening, speaking, reading, and writing. These language deficits are not due to sensory, motor, or cognitive deficits. The lab develops new methods to accurately identify these individuals so that they can receive services. It also examines how these individuals learn and how cognitive systems interact to support or limit learning. This basic information is translated to treatment studies designed to improve learning.	https://plante.lab.arizona.edu/
Robin Polt	polt@u.arizona.edu	Chemistry and Biochemistry	glycopeptides, synthesis, drug design	Much of our work revolves around converting peptide neurotransmitters and hormones into brain penetrant glycopeptide drugs. Beginning students synthesize glycoside starting materials and then assemble them into glycopeptide drug candidates as they progress. Students also use MOE (Molecular Operating System) to design structures "in silico."	https://bio5.org/people/robin-polt
Frank Porreca	frankp@email.arizona.edu	Pharmacology	pain, migraine, headache	My laboratory studies brain circuits that mediate acute and chronic pain and migraine. We study opioid receptor sensitive circuits in areas of the brain including the amygdala and the cortex. Our studies also explore sexually dimorphic mechanisms that can promote pain more readily in females.	https://pharmacology.arizona.edu/person/frank-porreca-phd
Linda Restifo	llr@arizona.edu	Neurology	genetics, brain, development, disease, neurodevelopmental, biomechanics, technology, fruit fly	2022 project: Stretch-triggered axon elongation. This is a great project for a bioengineering-oriented student with some knowledge of basic genetics and an interest in neuroscience. The technical goal is to use biological adhesives (e.g., barnacle glue) to develop a stretching protocol for the central nervous system (CNS) of the fruit fly. The biological goal is to determine whether the CNS is stretch-sensitive at key points during development and whether this proposed mechanism is defective in two different Drosophila mutants that fail to elongate an axon bundle that connects the brain to the spinal cord.	https://neurology.arizona.edu/linda-l-restifo-md-phd
Kelly Reynolds	reynolds@arizona.edu	Community Environment and Policy	environmental microbiology, hygiene, risk assessment, water quality	Dr. Reynolds is Professor and Chair of the Department of Community, Environment and Policy at the Zuckerman College of Public Health, and Director of the Environment, Exposure Science and Risk Assessment Center at the University of Arizona. She has over 34 years of experience as an environmental microbiologist and infectious disease researcher, specializing in water quality, food safety, and human health risk assessment. During her academic career, Dr. Reynolds has served as a principal investigator on numerous projects and published over 400 journal articles, book chapters, and professional reports. Her work has been featured in hundreds of popular media outlets, including the New York Times, Wall Street Journal, BuzzFeed, and Huffington Post. Dr. Reynolds specializes in integrating academic teams with industry and community stakeholders for a multidisciplinary approach toward research, communication, and management efforts in infection prevention.	https://esrac.arizona.edu/home
Art Riegel	ariegel@email.arizona.edu	Pharmacology	Behavior, addiction, neuroscience, pharmacology, brain, mental illness, imaging	Our laboratory investigates the cellular mechanisms in the brain responsive to addictive drugs (i.e., cocaine and opiates) and diseases such as chronic pain. We use various rodent models to study drug self-administration behaviors, immunohistochemistry to study brain receptor localization, and various genetic or electrophysiological strategies to study disease-related shifts in neuronal firing. Our goal is to determine why and how such diseases diminish “normal” brain function so that new medications can be designed to “re-tune” activity and diminish the negative behavioral symptoms associated with these diseases.	https://riegellab.arizona.edu/
Michael Riehle	mriehle@ag.arizona.edu	Entomology	mosquitoes, vector biology, arbovirus, malaria, fitness, transgenic, insulin, CRISPR, cas9, physiology, insect	I am interested in mosquito physiology and the interactions between mosquitoes and human pathogens such as malaria parasites, dengue virus and Zika virus. My lab is currently exploring how various signaling pathways, such as JNK and the insulin/insulin growth factor 1 signaling pathways, affect aging, reproduction, metabolism, development and immunity in mosquitoes. We are also looking to harness these signaling cascade as novel control strategies for mosquito-borne disease using cutting edge genetic manipulation strategies, including most recently CRISPR/cas9. I am interested in mosquito physiology and the interactions between mosquitoes and human pathogens such as malaria parasites, dengue virus and Zika virus. My lab is currently exploring how various signaling pathways, such as JNK and the insulin/insulin growth factor 1 signaling pathways, affect aging, reproduction, metabolism, development and immunity in mosquitoes. We are also looking to harness these signaling cascade as novel control strategies for mosquito-borne disease using cutting edge genetic manipulation strategies, including most recently CRISPR/cas9.	https://www.riehlelab.org/

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Todd Schlenke	schlenke@email.arizona.edu	Entomology	immunity virulence behavior genetics evolution Drosophila	Our lab studies host-parasite interactions using the fruit fly, Drosophila melanogaster, as our model host. One common parasite of flies are parasitoid wasps, which lay their eggs inside fly larvae. Flies fight off wasp infection using thousands of blood cells to attack the wasp egg, similar to human granulomas. Flies also have behavioral defenses to avoid infection or to cure themselves once infected. We study the genetics and cell biology of immunological and behavioral defenses.	https://cals.arizona.edu/research/schlenke/
Timothy Secomb	seocmb@u.arizona.edu	Physiology	mathematical modeling, circulatory system, physiology	We use theoretical and computational approaches to study the circulatory system, including blood flow and mass transport, structural adaptation of blood vessels, regulation of blood flow, mechanics of the heart, and neurovascular coupling in the brain.	https://physiology.arizona.edu/people/secomb
Catharine Smith	clsmith1@email.arizona.edu	Pharmacology and Toxicology	epigenetics, molecular endocrinology, cancer	Glucocorticoid signaling regulates the immune system, lung function, and metabolism, among other things, and is essential for life. Lysine/histone deacetylases are important regulators of the epigenome and targets of drugs used in treatment of cancer and neurological disorders. The Smith lab studies mechanisms by which the glucocorticoid receptor regulates transcription and discovered that lysine deacetylases facilitate rather then impair glucocorticoid-activated transcription. Our current focus is to understand the mechanism by which this occurs and identify the essential acetylated target proteins.	https://www.pharmacy.arizona.edu/directory/profile/catharine-smith-phd
John Streicher	jstreicher@arizona.edu	Medical Pharmacology	Opioids, Cannabinoids, Pain, Signal Transduction, Drug Discovery, Drug Development	The Streicher Lab is interested in the signal transduction cascades that link receptor systems like the opioid, cannabinoid, dopamine, and related receptors to downstream changes in brain states like pain, reward, and neurodegeneration. We investigate novel signal transduction regulators, and determine their molecular mechanisms using tools like CRISPR and immunohistochemistry. We then use these mechanisms to design novel drug discovery and development programs to make new and improved human medicines for conditions like pain and neurodegeneration.	https://medicine.arizona.edu/person/john-m-streicher-phd
George Sutphin	sutphin@arizona.edu	Molecular and Cellular Biology	aging, genetics, cancer, metabolism, cellular stress, machine learning, robotics	The goal of our research is to understand the mechanisms that drive biological aging and use this understanding to develop new therapeutic interventions to extend healthy lifespan and age-associated disease. We use roundworms (C. elegans), mice, and cultured cells as model systems. Current areas of focus are on the role of tryptophan-kynurenine metabolism in aging, immune function, and cancer, understanding the interaction between cellular stress response pathways during aging, and methods development for high-throughput healthspan and lifespan analysis in roundworms.	https://sutphinlab.org
Jennifer Teske	teskeja@email.arizona.edu	School of Nutritional Sciences and Wellness	sleep, metabolism, metabolic dysfunction	We use animal models to understanding how poor sleep contributes to metabolic dysfunction with emphasis on neural mechanisms.	https://nutrition.cals.arizona.edu/person/jennifer-teske-phd
Gregory Thatcher	grjthatcher@arizona.edu	Pharmacology and Toxicology	therapeutics, bioassay, disease models, biochemistry, medicinal chemistry	Disease-agnostic drug discovery from COVID and cancer to Alzheimer's and dementia demands bioassays that model aspects of the disease and/or specific therapeutic targets that may be associated with the disease state. Designing and validating these biochemical, cell, and tissue models is the essential first step in being able to design and optimize small molecule therapeutic agents. Designing, trouble-shooting, and using these assays for drug screening and optimization provides a rigorous training in biochemical, bioanalytical, and biological methodology and critical thinking.	https://thatcherresearchgroup.com/
Jana U'Ren	juren@email.arizona.edu	Biosystems Engineering	symbiosis, fungi, genome evolution, microbial ecology	The U'Ren lab uses a combination of traditional culture-based microbiology, functional assays, and genomic/metagenomic tools to study the ecology and evolution of endophytic fungi. Specifically, we are interested in characterizing the biotic and abiotic factors that shape the assembly of endophyte communities in natural and agricultural ecosystems, how endophyte community structure and diversity impact ecosystem function and plant health, and the evolutionary dynamics of fungal symbiont evolution.	https://www.uren.arizona.edu/
Todd Vanderah	vanderah@email.arizona.edu	Pharmacology	Pain, Addiction, cannabinoids, opioids	I work in the field of chronic pain and addiction. Our research is discovering new molecular targets to reduce chronic pain while not resulting in the rewarding behaviors that can lead to addiction.	https://pharmacology.arizona.edu/person/todd-vanderah-phd
Donata Vercelli	donata@arizona.edu	Cellular and Molecular Medicine	Asthma, allergies, immune response, environment	Dr. Vercelli's research seeks to elucidate the impact of environment, genes and development on the pathogenesis of complex diseases. To this end, her laboratory has developed powerful mouse and human models of asthma-protective environmental exposures, particularly those associated with traditional farming.	https://scholar.google.com/citations?hl=en&user=kokKO0AAAAAJ
Jean Wilson	jeanw@arizona.edu	Cellular and Molecular Medicine	Cell Biology, signaling, membrane trafficking	We have two major projects. In the first we are studying how endocytic and autophagic machinery interact in inflammatory bowel disease. In our second project, we are examining how cytomegalovirus impacts host cell trafficking for its own replication.	https://cmm.arizona.edu/profile/jean-wilson-phd
Russ Witte	rwitte@arizona.edu	Medical Imaging	brain, heart, ultrasound, optical, photoacoustic, imaging, EEG, electrophysiology, modeling, biomedical engineering, optical sciences, simulation, acoustoelectric	My experimental and neural imaging lab (EUNIL) develops cutting-edge noninvasive imaging modalities that combine ultrasound, light and/or electricity (scalable from mouse to humans). These hybrid techniques exploit novel contrast mechanisms to visualize mechanical, electrical and optical properties of tissue. As an example, acoustoelectric imaging exploits and interaction between an ultrasound wave and tissue resistivity to detect and map physiologic currents in the heart and brain at higher spatial resolution than conventional methods (e.g., ECG, EEG). The techniques can also be combined with therapy systems (e.g., neuromodulation) to optimize treatment paradigms. The methods and instrumentation developed in EUNIL have a wide range of neural (and non-neural) applications--from helping diagnose and treat epilepsy to neuroprotection following a traumatic brain injury.	http://www.u.arizona.edu/~rwitte

Name	Email Address	Primary Department	Research Keywords	Research Description	Website
Georg Wondrak	wondrak@arizona.edu	Pharmacology and Toxicology	cancer, oxidative stress, skin photodamage, melanoma, redox drugs	My research examines the pathological role of oxidative stress in solar photodamage and skin cancer (melanoma and nonmelanoma) aiming at the design of novel molecular strategies for redox-directed prevention and therapeutic intervention, investigations with potential relevance to other malignancies with insufficient treatment options including prostatic and pancreatic carcinoma. Based on my international professional training and proven track record in skin solar ultraviolet radiation/photodamage-related biochemical and pharmacological investigations, my research team at the College of Pharmacy and The University of Arizona Cancer Center is well positioned to pursue translational biomolecular investigations that test preventive and therapeutic efficacy of pharmacological modulation of cellular stress response pathways impacting skin photo-damage and photo-carcinogenesis through redox regulatory molecular targets [such as TLR4 (Toll-like receptor 4), NRF2 (Nuclear factor erythroid 2–related factor 2), and GLO1 (Glyoxalase 1)]. Our NCI-funded melanoma-directed research tests feasibility of repurposing clinical redox antimalarials (including artemisinin-endoperoxides) for therapeutic intervention in advanced murine disease models. We are also testing the redox-based cancer-directed activity of diverse small molecule agents modulating the cellular stress response [including hypochlorous acid (HOCl) and deuterium oxide (D2O) causing oxidative and isotopic (heavy atom) disruption].	https://www.pharmacy.arizona.edu/directory/profile/georg-wondrak-phd
Hua Xu	hxu@email.arizona.edu	Pediatrics	gene regulation, inflammation, ion transporter, organoid culture	Na+/H+ exchangers (NHEs) are a family of membrane proteins that transport one sodium ion into cells by exchanging one proton out of cells. These proteins have critical roles in many physiological and pathological processes. They are involved in electroneutral NaCl transport, acid-base regulation, intracellular pH homeostasis, and cell volume regulation. Their activity also facilitates cellular adhesion, migration, and proliferation. Each member of the NHE family has its unique tissue distribution, cellular localization, inhibitor sensitivities, and physiological regulation. Since cloning the newest NHE family member NHE8, my research focuses more on the role of NHE8 in the gastrointestinal tract, the liver, colon cancer, the eye and male reproductive function.	https://peds.arizona.edu/faculty/hua-xu
Ramin Yadegari	yadegari@arizona.edu	School of Plant Sciences	development, plants, endosperm, seed, transcription, gene networks, maize, sorghum	Our research is focused on understanding the transcriptional regulatory processes that underlie endosperm development in maize (corn). Endosperm is the nutritive structure of the seed and supports embryogenesis and seedling development in flowering plants. We employ molecular and computational approaches to identify the gene networks regulated by key transcription factors driving endosperm cell proliferation and differentiation. Currently, our studies are focused on the role of gene networks driving the development of an endosperm transfer cell that has evolved to transport sugars and metabolites from the maternal plant into the developing maize kernel.	http://raminyadegari.org
Guang Yao	guangyao@arizona.edu	Molecular and Cellular Biology	Systems biology, genetics, cancer, aging, regeneration	We study gene network "switches" that control the dormancy and growth of normal and cancer cells. Currently, our particular focus is on the distinction and connection between two dormant cellular states, quiescence (reversible) and senescence (irreversible), both being regulated by an Rb-E2F-Cdk gene network switch and its interacting pathways (e.g., cell metabolism and circadian rhythm). We aim to develop an integrated understanding of different cell dormancy states and their implications in anti-cancer, anti-aging, and regenerative medicine.	http://www.u.arizona.edu/~guangyao/
Jeong-Yeol Yoon	jyyoon@arizona.edu	Biomedical Engineering	biosensor, organ-on-a-chip, machine learning, medical diagnostics, environmental monitoring	Smartphone- and machine learning-based biosensors and organ-on-a-chip for medical diagnostics, drug testing, and environmental monitoring.	https://biosensors.abe.arizona.edu
Frederic Zenhausern	fzenhaus@arizona.edu	Basic Medical Sciences	molecular and cellular assays; organ-on-chips; radiobiology; space medicine; diagnostics;	The Center's research projects are sponsored by industry and most of federal agencies (e.g. NIH, DoD, NASA...) highlighting the interdisciplinary and translational nature of the work. Some current areas of technology development comprise organ-on-chip and microfluidic devices for drug discoveries, point-of-care medical devices, bioassay development for broad applications in cancer biology, radiobiology, microbiome, molecular diagnostics, global health, space medicine and new drug compounds and delivery systems for personalized medicine. The developments in other fields of engineering comprise technologies for DNA data storage, drone delivery systems, AR/VR avatar platform, quantum sensing and so on.	https://phoenixmed.arizona.edu/anbm
Ningning Zhao	zhaonn@email.arizona.edu	Nutritional Sciences and Wellness	Minerals, Nutrition, Neurodegeneration, Iron deficiency, Iron overload, Manganese Metabolism	The work in our Lab is focused on advancing molecular mechanisms for the function and regulation of plasma membrane metal transporters. These transporters play fundamental roles in regulating cellular metabolism and cellular function. Mutations and malfunctioning of these transporters are directly pertinent to the initiation and the progression of an increasing number of human diseases, including iron deficiency, hemochromatosis, cancer, and childhood on-set neurodegeneration. We identify and characterize the genes and factors that are involved in determining the structure and function of these metal transporters. We also examine the intracellular trafficking and degradation of these proteins. In our research, we combine cell-line and mouse models, and employ a variety of biochemical and molecular biology techniques. We also utilize the cutting-edge genome engineering technologies, including Adeno-Associated Virus-mediated genomic modification and CRISPR/Cas9-mediated genome editing. We hope that our research will advance the understanding of disease mechanisms, identify therapeutic target genes, and improve the life quality of patients.	https://nutrition.cals.arizona.edu/person/ningning-zhao-phd