Annual Report - Academic Year 2020 - 2021

Department of Biochemistry and Molecular Biology

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Annual Report 2020 -2021

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Introduction

Mission Statement

The Department of Biochemistry and Molecular Biology at LSUHSC is dedicated to two central goals. First, we investigate the fundamental molecular mechanisms that enable cells and organisms to grow, reproduce, and interact with their environment. The knowledge gained from our studies will deepen our understanding of biology, generate novel reagents and products, and, most importantly, improve human health. Our research is focused on solving major problems in human disease, primarily cancer, diabetes, neurodegenerative and genitourinary diseases. Second, we train the next generation of scientists, which includes graduate students, medical students, postdoctoral fellows, and undergraduates. Our faculty members have research programs in cancer biology, cell signaling, regulation of gene expression, and neuroscience. Our students are challenged to address fundamental mechanistic questions in these areas. Graduates from our PhD program will have developed the skills to identify important research problems, plan appropriate experimental approaches, communicate their research results and their significance both orally and in written form, and publish their results in high impact journals. One measure of our success is that graduates from our program have obtained postdoctoral positions in prominent labs, faculty positions, leadership positions in academia, and jobs in industry. To date, over 100 students have earned PhD degrees from our department.

The following report covers the activities of Departmental members in each of these three areas for the period from July 1, 2020 - June 30, 2021.

Departmental Personnel

Faculty

Tenure Track

Arrigo De Benedetti, B.S., 1979, Bar Ilan University, Israel; Ph.D., 1985, State University of New York at Albany; Professor of Biochemistry and Molecular Biology

Eric A. First, B.S., 1979, University of Wisconsin; Ph.D., 1987, University of California at San Diego; Associate Professor of Biochemistry and Molecular Biology

David S. Gross, B.A., 1974, Northwestern University; Ph.D., 1981, University of Colorado; Professor of Biochemistry and Molecular Biology

Shile Huang, B.S., 1984, Anhui Agricultural University, China; M.S., 1987, Nanjing Agricultural University, China; Ph.D., 1997, University of Salzburg, Austria; Associate Professor of Biochemistry and Molecular Biology

Nancy Leidenheimer, B.S., 1981, Longwood College; Ph.D., 1989, Kent State University; Professor of Biochemistry and Molecular Biology

Brent C. Reed, B.S., 1968, University of Utah; Ph.D., 1976, University of Utah; Associate Professor of Biochemistry and Molecular Biology

Lucy C. Robinson, B.A., 1983, University of Maryland; Ph.D., 1989, University of Pennsylvania; Associate Professor of Biochemistry and Molecular Biology

Kelly G. Tatchell, B.A., 1974, University of Montana; Ph.D., 1978, Oregon State University; Professor of Biochemistry and Molecular Biology

Stephan N. Witt, B.F.A., 1979, Tufts University; B.S., 1981, Union College; Ph.D., 1988, California Institute of Technology; Professor and Chairman of Biochemistry and Molecular Biology

Xiuping Yu, B.S., 1991, Nankai University, China; Ph.D., 2000, Medical University, China; Assistant Professor of Biochemistry and Molecular Biology

Research Track

Sergey Slepenkov, M.S., 1972, St. Petersburg State University, Russia; Ph.D., 1980, St. Petersburg State University; Research Assistant Professor of Biochemistry and Molecular Biology

Gulshan Sunavala-Dossabhoy, B.D.S., 1988, University of Bombay, India; M.S., 1995, New York College of Dentistry; Ph.D., 2000, University of Texas Health Science Center; Research Associate Professor of Biochemistry and Molecular Biology

Adjunct Faculty

Sushil K. Jain, M.S., 1972, Institute of Medical Education and Research, India; Ph.D., 1976, Institute of Medical Education and Research; Professor of Pediatrics; Professor of Molecular and Cellular Physiology; Professor of Biochemistry and Molecular Biology

Gratis Faculty

Steven A. Conrad, M.D. 1978, Louisiana State University Health Sciences Center Shreveport, Ph.D., 1985, Case Western Reserve University, MBA, 2001, Louisiana State University Shreveport; Professor of Medicine, Emergency Medicine, Pediatrics, Surgery, Anesthesiology, and Biochemistry and Molecular Biology

Cherie-Ann O. Nathan, M.D, 1981, University of Bombay; Jack W Pou Endowed Professor and Chairman Department of Otolaryngology/Head and Neck Surgery; Director of Head & Neck Surgical Oncology and Cancer Research FWCC Shreveport; Chief of Service: Otolaryngology/HNS University Health; Associate Member of the Graduate Faculty in the Dept. of Biochemistry & Molecular Biology

Mary Lowery-Nordberg, B.S., 1980, Texas A&M University; Ph.D., 1987, The University of Texas Medical Branch; Fellowship, Clinical Cytogenetics/Medical Genetics, 1995, University of Utah Medical School; Professor of Biochemistry

Robert E. Rhoads, B.A., 1966, Rice University; Ph.D., 1971, George Washington University; Professor of Biochemistry and Molecular Biology

Postdoctoral Fellows

Zhu Huang
Rajyalakshmi Meduri
Reynaldo Moreno
Rajesh Parsanathan
Yingli Shi
Vibha Singh
Santhanasabapathy Rajasekaran

Graduate Students

Mohammed Alam
Shawn Allen
Nirjhar Aloy
Siyuan Cheng
Ishita Ghosh
Md Imtiaz Khalil
Erika Knott
Lin Li
Christopher Madere
Suman Mohajan
Vickky Pandit
Linda Rubio
Sahar Shekoohi

Technical Staff

Janice Chalmers-Priest
Alonzo Smally

Research Associates

Shu Yang
Nithya Gajendran

Office Staff

Vivinlee McCranie

Research

Faculty Research Interests

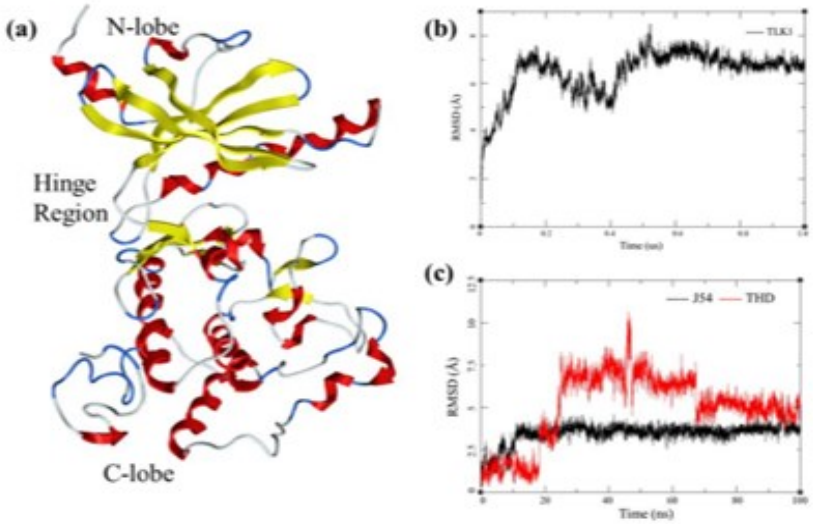
Arrigo De Benedetti

Major Research Interests: Prostate Cancer therapy based on the DNA Damage Response (DDR).

Standard therapy for advanced Prostate Cancer (PCa) consists of anti-androgens, which provide respite from disease progression, but ultimately fail resulting in the incurable phase of the disease: mCRPC. Targeting PCa cells before their progression to mCRPC would greatly improve the outcome. Combination therapy targeting the DNA Damage Response (DDR) has been limited by general toxicity, and a goal of clinical trials is how to target the DDR more specifically. We now show that androgen deprivation therapy (ADT) of LNCaP cells results in increased expression of TLK1B, a key kinase upstream of NEK1 and ATR and mediating the DDR that typically results in a temporary cell cycle arrest of androgen responsive PCa cells. Following DNA damage, addition of the TLK specific inhibitor, thioridazine (THD), impairs ATR and Chk1 activation, suggesting the existence of a TLK1>NEK1>ATR>Chk1, DDR pathway, while its abrogation leads to apoptosis. Treatment with THD suppressed the outgrowth of androgen-independent (AI) colonies of LNCaP cells cultured with bicalutamide. Moreover, THD significantly inhibited the growth of several PCa cells *in vitro* (including androgen independent lines). Administration of THD or bicalutamide was not effective in inhibiting long-term tumor growth of LNCaP xenografts. In contrast, combination therapy remarkably inhibited tumor growth via bypass of the DDR. Moreover, xenografts of LNCaP cells overexpressing a NEK1-T141A mutant were suppressed with bicalutamide alone. Collectively, these results strongly suggest that targeting the TLK1/NEK1 axis (with THD or J54) might be a novel therapy for PCa in combination with standard of care (ADT), likely also because of our novel discovery that Nek1 is a key mediator of the Hippo/YAP pathway.

Moreover, TLK1 is a key activator of a pathway regulated by MK5, which we are discovering is critical for PCa migration and metastasis. In addition to this project, we have another project dealing with the function of TLK1 in HDR based on its regulation of Rad54, and another studying cell motility/invasion/metastasis based on TLK1 interaction with MK5.

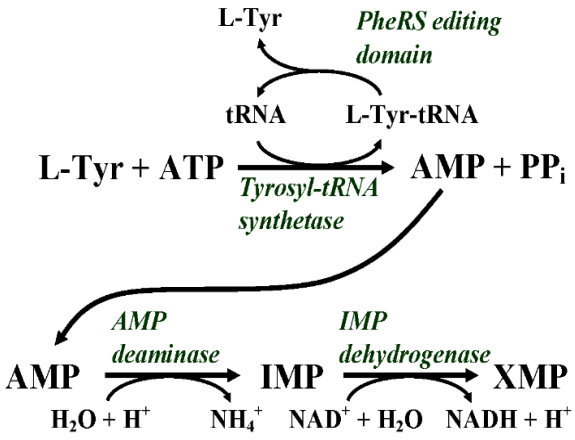
TLK1 CTD (kinase domain) with Molecular dynamics simulation of docked inhibitor THD (red trace) vs J54 (black trace – new inhibitor)



Eric A. First

Major Research Interests: Aminoacylation of tRNA; expansion of the genetic code; Charcot-Marie-Tooth disorder; high throughput enzyme kinetics; novel chemotherapy agents.

Aminoacyl-tRNA synthetases catalyze the attachment of amino acids to their cognate tRNAs. This reaction occurs by a two-step mechanism in which the amino acid is first activated and then transferred to the 3'-end of the cognate tRNA. Misacylation of tRNA with the wrong amino acid occurs less than one time for every 10,000 rounds of catalysis that the enzyme performs. Our current research focuses on three areas related to aminoacyl-tRNA synthetases. First, we are developing methods to expand the genetic code to include *D*-amino acids. Current efforts are aimed at engineering orthogonal tyrosyl-tRNA synthetase variants that are specific for either *D*- or *L*-tyrosine. This research led to the development of a tyrosyl-tRNA synthetase variant that catalyzes the aminoacylation of tRNA by D-tyrosine more efficiently than it does for L-tyrosine. In addition, during the course of this research, several continuous spectrophotometric assays were developed, including assays for monitoring the kinetics of tRNA aminoacylation by tyrosyl-tRNA synthetase and post-transfer editing by phenylalanyl-tRNA synthetase. Second, we are testing the hypothesis that the post-transfer editing site in aminoacyl-tRNA synthetase can be used as a target for developing novel chemotherapy agents. Malignant cells are under high levels of proteotoxic stress making them susceptible to drugs that increase the amount of misfolded proteins. Inhibiting post-transfer editing will increase the rate of tRNA misacylation, resulting in the wrong amino acid being incorporated during protein synthesis. This will produce misfolded proteins, increasing the proteotoxic stress in malignant cells. To test this hypothesis, we screened the NIH Clinical Collection for inhibitors of post-transfer editing by human phenylalanyl-tRNA synthetase. Two compounds identified from this screen are being tested for their ability to inhibit growth in several cancer cell lines. Third, we are investigating the role that the tyrosyl-tRNA synthetase plays in Charcot-Marie-Tooth disorder. Charcot-Marie-Tooth disorder (CMT) is the most common inherited peripheral neuropathy, affecting 150,000 individuals in the U.S. Patients experience degeneration of their peripheral nerve cells, leading to atrophy of the muscles controlling their hands, feet, forearms, and lower legs. Ultimately, this leads to loss of the ability to perform routine tasks such as holding a pencil or turning a doorknob. Mutations in at least six aminoacyl-tRNA synthetase give rise to Charcot-Marie-Tooth disorder. In particular, five different mutations in the gene encoding human tyrosyl-tRNA synthetase are responsible for a form of CMT known as Dominant Intermediate Charcot-Marie-Tooth disorder (DI-CMTC). To help elucidate the connection between aminoacyl-tRNA synthetase and Charcot-Marie-Tooth disorder, we are developing an animal model for DI-CMTC.



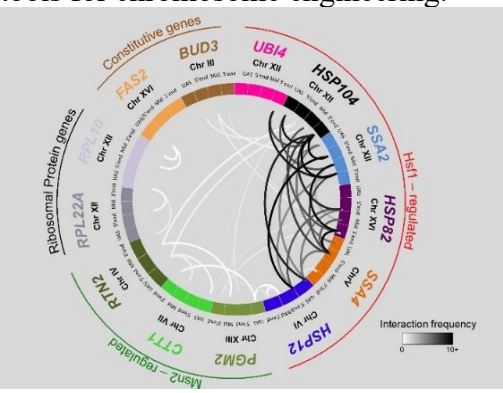
Reaction scheme for the phenylalanyl-tRNA synthetase post-transfer editing assay. To monitor post-transfer editing by the phenylalanyl-tRNA synthetase editing domain, L-Tyr-tRNA is generated *in situ* by tyrosyl-tRNA synthetase. The formation of L-Tyr-tRNA is accompanied by the release of AMP. The production of AMP is coupled to the formation of NADH via AMP deaminase and IMP dehydrogenase. The rate-limiting step in this assay is hydrolysis of L-Tyr-tRNA by the phenylalanyl-tRNA synthetase editing domain, regenerating the tRNA substrate. Since neither the tRNA nor L-tyrosine substrates are consumed in the reaction, the extent of the reaction is limited only by the concentration of ATP, which is over 1000-fold higher than the tRNA concentration in the assay. AMP, IMP, XMP, PPi, and L-Tyr represent adenosine 5'-monophosphate, inosine 5'-monophosphate, xanthine 5'-monophosphate, inorganic pyrophosphate, and L-tyrosine, respectively.

David S. Gross

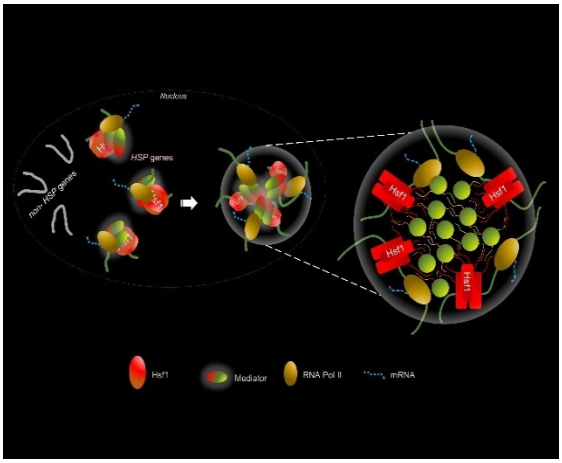
Major Research Interests: Regulation of gene expression; chromosome conformation of genes and their 3D nuclear organization; transcriptional response to heat shock.

Our research is focused on fundamental mechanisms of gene regulation, in particular the role that chromatin (the DNA-protein complex comprising chromosomes), nuclear RNAs and three-dimensional genome architecture play in regulating transcription. Precise control of gene expression is paramount to proper cell differentiation and normal organismal development. Misregulation of gene expression, caused either by mutation or pharmacologic perturbation, can lead to human diseases, including developmental disorders, cancer, and neurodegeneration.

Recent work in our lab using the model organism *S. cerevisiae* (budding yeast) has revealed that genes regulated by the transcription factor Heat Shock Factor 1 (Hsf1) undergo dramatic local restructuring and global repositioning upon their activation. These *Heat Shock Protein* (*HSP*) genes encode protein-folding chaperones and are transcribed at an extremely high level when cells are exposed to thermal, chemical, or oxidative stress. Accompanying their activation, *HSP* genes engage in intense physical interactions across and between chromosomes and coalesce into discrete intranuclear foci. This global restructuring is distinctive to the ~50 genes under the regulation of Hsf1. Other transcriptionally active genes fail to form detectable interactions among themselves or with *HSP* genes. Our data suggest that Hsf1, likely in combination with other factors (currently under investigation), drives its target loci into a phase-separated state whose assembly is highly dynamic and critically required for cell survival under conditions of thermal stress. Regions within Hsf1 responsible for the coalescence of *HSP* genes may represent tools for chromosome engineering.



Circos diagram illustrating intergenic interactions detected in acutely heat-shocked cells using the chromosome conformation capture (3C) technique. As illustrated, Hsf1-regulated genes specifically interact with one another under such conditions; they show no detectable interaction with any other gene family. Concomitantly, their transcription is greatly induced.



Yeast *HSP* genes (*green*) are occupied by unusually high densities of activator (*Hsf1, red rectangles*), RNA Pol II (*yellow oval*) and other transcriptional and post-transcriptional factors such as Mediator (*multicolored oval*) and exhibit strong inter-chromosomal interactions upon their induction. Recent evidence suggests that these factors and genes coalescence into discrete intranuclear condensates.

Shile Huang

Major Research Interests: Cell signaling and tumorigenesis

The laboratory is primarily interested in understanding the role of mTOR signaling in tumorigenesis and metastasis, as well as neurodegenerative disorders. mTOR functions as two complexes (mTORC1 and mTORC2), and regulates cell growth, proliferation, survival, and motility. We are focusing on elucidating how mTOR mediates cell motility. Besides, the laboratory is investigating the molecular mechanisms of anticancer action of small molecules, such as artemisinin and ciclopirox olamine. Artemisinin is a natural product isolated from the plant *Artemisia annua*, whereas ciclopirox olamine is an off-patent synthetic fungicide. Of note, artesunate (a water-soluble artemisinin derivative) and ciclopirox olamine are undergoing early clinical trials as novel anticancer agents. However, how they execute the anticancer action remains unclear. We are studying the underlying molecular mechanisms. Furthermore, the laboratory is also interested in exploring novel interventions to combat neurodegenerative diseases. In particular, we are determining the mechanisms of neuroprotection of new and 'repurposed' drugs against heavy metal cadmium-induced neuronal cell death.

Figure 1

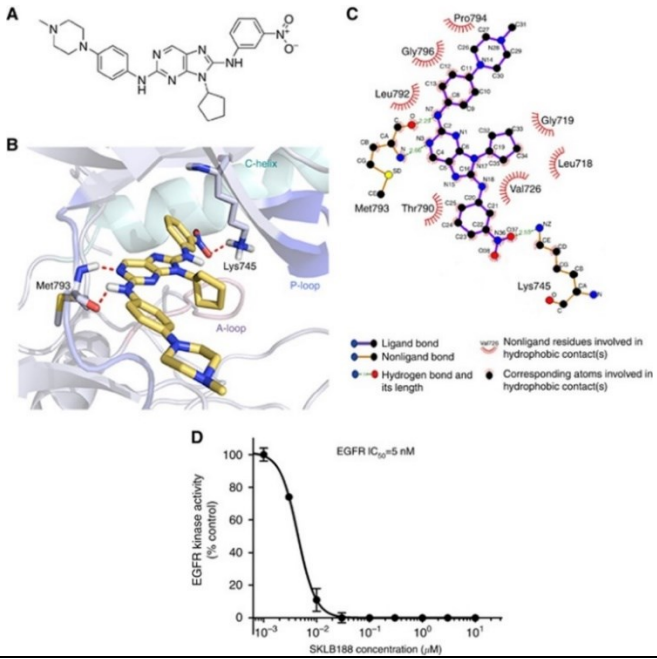


Figure 2

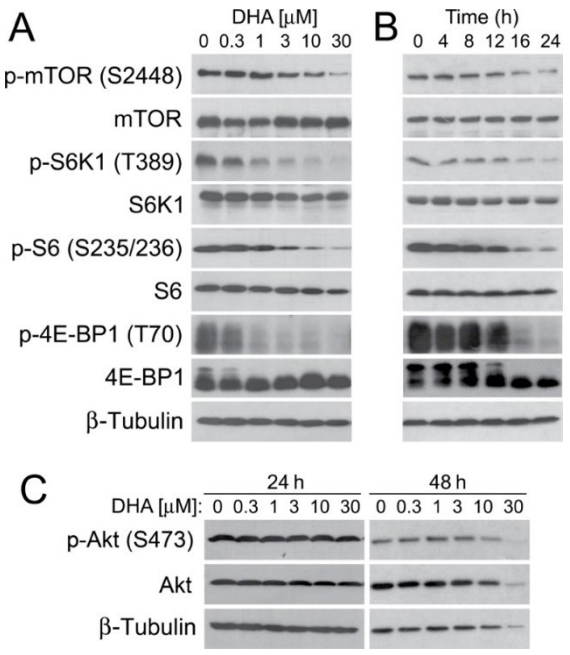


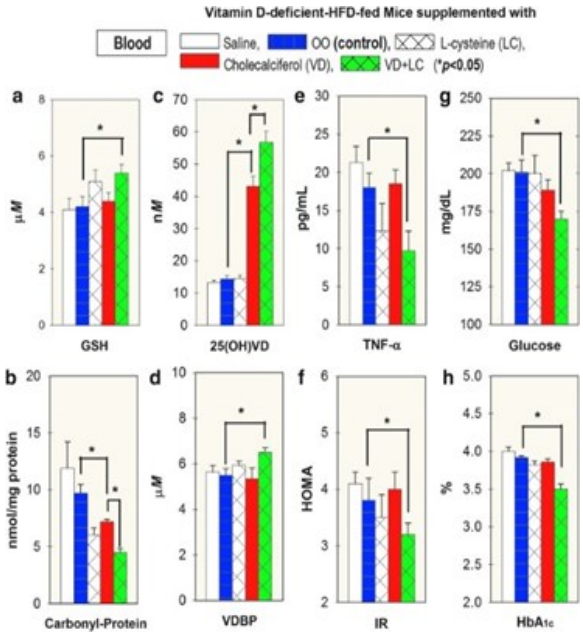
Figure 1. SKLB188 is predicted to bind the EGFR kinase domain and inhibits EGFR activity in vitro. (A) Chemical structure of SKLB188. **(B)** SKLB188 is docked into the EGFR kinase domain, showing interactions between SKLB-188 and EGFR. **(C)** A two-dimensional interaction map of SKLB188 and EGFR. **(D)** A dose-response curve showing that SKLB188 (0–10 μM) inhibits the activity of recombinant human EGFR dose dependently by an in vitro kinase assay.

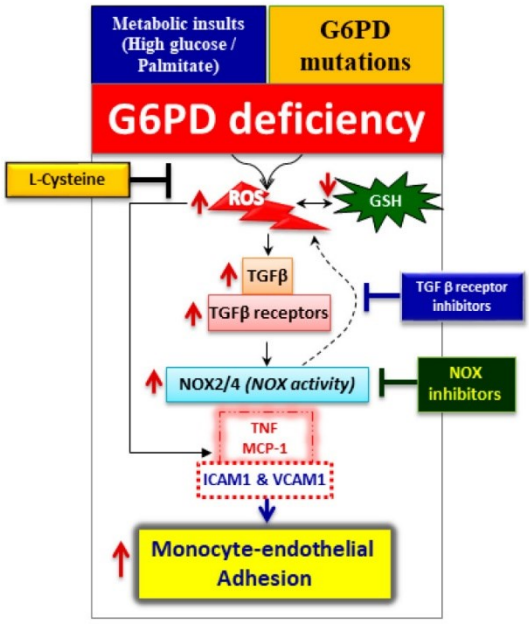
Figure 2. DHA inhibits mTORC1-mediated phosphorylation of S6K1 and 4E-BP1 but does not affect mTORC2-mediated phosphorylation of Akt. (A and **B)** Rh30 cells were treated with DHA for 24 h at indicated concentrations **(A)**, at 3 μM for indicated time **(B)**, followed by Western blotting with indicated antibodies. **(C)** Rh30 cells were treated with DHA for indicated time at indicated concentrations, followed by Western blotting with indicated antibodies.

Sushil K. Jain

Major Research Interests: Nutrition and free radicals; cellular damage in health and disease

Our research interests focus on investigating the role of oxidative stress and micronutrition in the pathophysiology of obesity, insulin resistance, and diabetes. We are studying how micronutrients (L-cysteine and Vitamin D) and hydrogen sulfide regulate insulin signaling pathways of glucose metabolism and insulin resistance in type 2 diabetes. We have characterized that the widespread glucose-6-phosphate dehydrogenase-deficiency could play a critical role in the higher incidence and severity of CVD in the African-American population. Our team has recently discovered that the deficiency of 25(OH)VD is linked with deficiency of major antioxidant glutathione, and that combined supplementation of vitamin D and glutathione precursor is a novel and successful approach to treat VD deficiency in the minority populations. Our research publications have over 17000 citations with an H index of 68.





A**: Effect of supplementation with VD+LC (*green bar*) *versus* VD alone (*red bar*) on blood levels of GSH (a), carbonyl protein (b), 25 (OH)VD (c), VDBP (d), TNF-α (e), HOMA-IR (f), fasting glucose (g), and HbA_{1c} (h) in mice maintained on a VD-deficient HFD for 16 weeks.** Mice were gavaged with saline, OO, LC, VD, or VD+LC during last 8 weeks. VD was dissolved in OO and one group was also gavaged with OO (vehicle) alone. This shows a significantly greater increase in GSH and 25(OH)VD, and lower TNF-α, IR, glucose, and HbA_{1c} levels in combined VD+LC compared with those supplemented with VD alone.

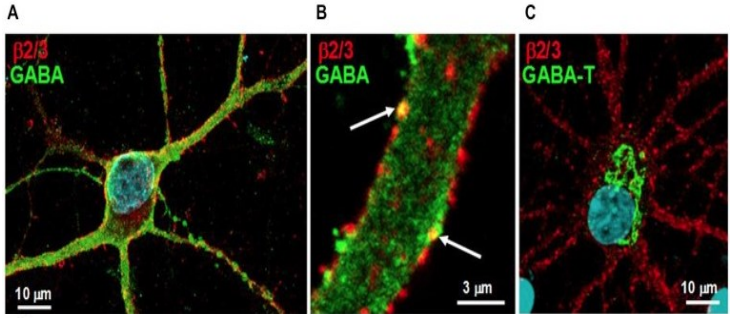
B: **Schematic illustration of the proposed molecular mechanism of glucose-6-phosphate dehydrogenase (G6PD) deficiency in human aortic endothelium and monocytes.** Metabolic insults (treatment with high glucose or palmitate) or G6PD gene mutations can cause G6PD deficiency. This generates excess oxidative stress, induces cytokines (TNF and MCP-1), upregulates cell adhesion molecules (ICAM-1 and VCAM-1), and favors monocyte-endothelial cell adhesion. Supplementation with L-cysteine (a GSH precursor) or ablation of the TGF-β signaling complex and NOX by inhibitors abolishes excess oxidative stress and inhibits monocyte-endothelial adhesion in G6PD-deficient cells.

Nancy Leidenheimer

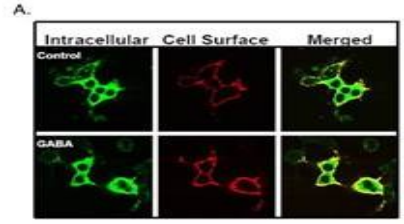
Major Research Interests: $GABA_A$ receptor trafficking and regulation by post-translational mechanisms. Role of the GABA system in cancer progression.

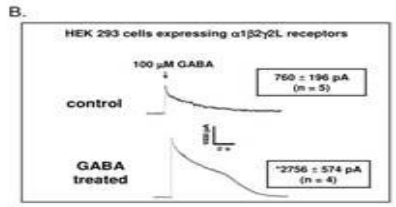
The neurotransmitter γ-aminobutyric acid (GABA) is the main inhibitory neurotransmitter in the central nervous system. Approximately 30% of synapses in the brain contain $GABA_A$ receptors, a subtype of GABA receptor that mediates fast inhibitory neurotransmission throughout the brain. Upon binding GABA, an integral chloride channel within the receptor is gated, allowing chloride influx and leading to membrane hyperpolarization. The $GABA_A$ receptor is associated with a variety of psychiatric (anxiety, schizophrenia) and neurological (epilepsy, insomnia) disorders. Importantly, it is the target of therapeutic agents including benzodiazepines, barbiturates, and anesthetics. Our lab focuses on the ability of GABA to act as a "cognate ligand chaperone" of nascent GABAA receptors undergoing biogenesis in the ER.

My career has been spent studying the GABAergic system (encoded by 29 genes) in neurons/model systems, including the manipulation of the enzymes, transporters and receptors that comprise this complex system. In the last few years, I have brought my neuroscience expertise to explore the potential role of the GABAergic system in cancer biology. In this context, we have investigated both the role of the GABA shunt and GABA receptors in cancer progression using bioinformatics data mining and cell growth phenotype assays. Part of this work has been published and another manuscript is in preparation. Additionally, I continue a funded collaboration with Li Li, Ph.D. M.D. at The Ochsner Clinical Foundation in New Orleans to examine the role of GABRP, a gene encoding the subunit protein of the $GABA_A$ receptor, in colon cancer.



Neurons expressing surface $GABA_A$ receptors contain both the neurotransmitter GABA and its degradative enzyme GABA transaminase. **(A)** Living low-density neuronal cultures were immunolabeled for surface $GABA_A$ receptors using an anti-β2/3 subunit antibody, fixed, permeabilized and immunolabeled for the neurotransmitter GABA. Surface receptors (red) are distributed throughout both the soma and processes, whereas GABA immunoreactivity (green) is observed throughout the neuron but most prominently in the processes. **(B)** An enlarged image of a neuronal process immunolabeled as described in **(A)**. Note the punctate distribution of the receptor, the diffuse cytoplasmic staining of GABA and the colocalization of GABA with some surface receptor puncta (arrows). **(C)** Neuronal cultures were immunolabeled for surface $GABA_A$ receptors using an anti-β2/3 subunit antibody, fixed, permeabilized and immunolabeled for GABA transaminase (GABA-T) (green). Note that GABA transaminase immunoreactivity is localized to the cell soma.

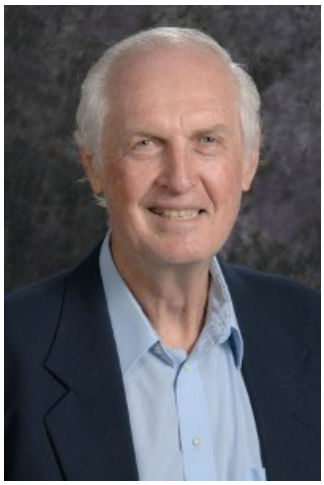




GABA treatment promotes surface expression of $GABA_A$ receptors composed of α1β2γ2L subunits

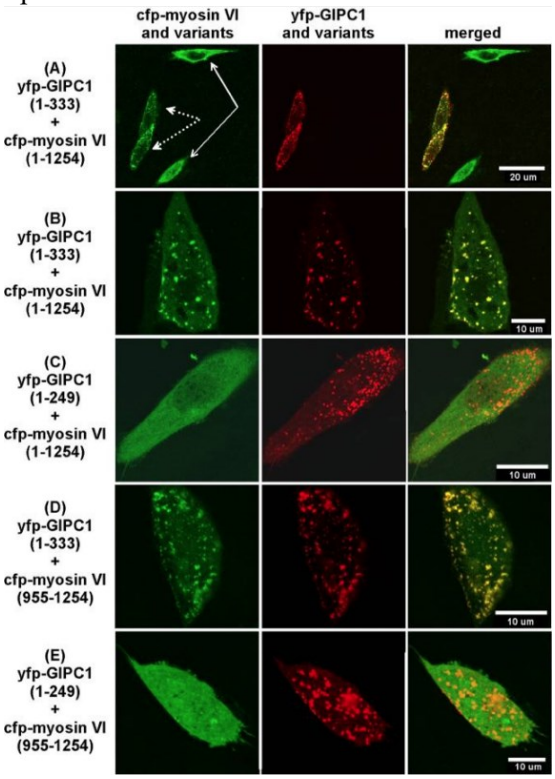
A) HEK 293 cells were transfected with α1, β2, and $\gamma 2L^{V5}$ subunit cDNAs and incubated throughout the transfection and expression period in the absence or presence of 100 µM GABA. Forty-two hrs post-transfection, cell surface and intracellular $GABA_A$ receptor populations were labeled by indirect immunofluorescence using an anti-V5 antibody and imaged by confocal microscopy (images representative of 20 independent experiments each performed in triplicate). **B)** The whole-cell patch-clamp technique was used to measure GABA-gated chloride currents. Following a 42 hr GABA incubation period, GABA-containing medium was removed from culture dishes and replaced with GABA-free medium for at least two hrs prior to electrophysiological recording to avoid receptor desensitization from prolonged GABA treatment. GABA-gated chloride current peak amplitudes were measured in response to GABA (100 µM) applied with a solenoid-controlled superfusion system. Asterisk indicates that GABA-gated chloride current peak amplitudes were significantly different between cells incubated in GABA for 42 hrs. vs. control (*, $p \leq 0.01$, unpaired t-test).

Brent C. Reed



Major Research Interests: Functions of GLUT1CBP (GIPC), a myosin VI adapter protein.

We have identified an adapter protein, GLUT1CBP (now termed GIPC), which contains both a PDZ domain that binds to the C-terminal four amino acid residues of GLUT1 and a C-terminal domain that interacts with the tail domain of myosin VI. The movement of GIPC is microtubule-independent, actin-dependent, and occurs coordinately as a complex with myosin VI in a direction consistent with myosin VI-coupled movement. The large number of proteins identified by our laboratory and others that interact with the PDZ domain of GIPC implicate GIPC as an important adapter protein that links diverse cargos, bound by the PDZ domain, to cellular movement and targeting via the atypical motor protein myosin VI. This would suggest that one potential cellular function for GIPC is to provide an important protein/vesicle targeting and/or anchoring role for proteins that bind to its PDZ domain. Thus, our current efforts are focused upon examining the function of GIPC in regulating the distribution and movement of GLUT1 and other interacting proteins within the cell. Several of the newly identified interacting proteins participate in important pathways that regulate cell adhesion, cell division, motility, tight junction integrity, and the availability of sugar as an energy source for the cell. In particular, we have identified b-catenin as a new interacting partner, and have linked the b-catenin bound proteins E-cadherin in prostate cancer cells, and PECAM1 in endothelial cells to GIPC dependent redistribution. Recently, we have noted that loss of GIPC partially impairs androgen stimulated androgen receptor nuclear translocation and transcription of androgen regulated genes. Therefore, our laboratory is interested in understanding the regulatory functions that GIPC might exert in these pathways that could alter diverse disease process, e.g., tumor progression in cancer and disrupted blood-brain-barrier function after stroke.



Lucy C. Robinson

Major Research Interests: Control of cell growth and division; protein phosphorylation; cellular morphogenesis; yeast genetics and cell biology

Reversible protein phosphorylation is a major post-translational regulatory mechanism. Diverse protein kinases and phosphoprotein phosphatases influence cell growth and division, differentiation, and environmental responses in all cells. Activities of protein kinases often are linked in cascades due to regulation of protein kinase activities by reversible phosphorylation, resulting in response systems that are sensitive to multiple input signals and can adjust levels of response to varying levels of signal. My laboratory has focused on the biological activities, targets, and regulation of a yeast protein kinase (Yck = yeast casein kinase 1; CK1) that is ideally suited to participate in phosphorylation cascades, since its recognition site can be created by a phosphorylation event. More than eight mammalian CK1 enzymes exist. We have identified several pathways that require Yck activity and have evidence that Yck2 activity is negatively regulated by phosphorylation. Currently, however, lab effort is on collaborative projects- one with the Tatchell laboratory to study the maturation and remodeling of phosphoprotein phosphatase type 1 in yeast, and the other on a NASA project with the Harrison laboratory to develop a yeast system to assess the effects of microgravity and space radiation on cellular survival of oxidative stresses.

Sergey Slepenkov

Major Research Interests: Assembly of protein synthesis initiation factor complexes; protein folding; alpha-synuclein aggregation.

Dr. Slepenkov's major research interests include understanding the regulation and functions of the protein synthesis initiation factor eIF4E (cap-binding protein), dysregulation of protein synthesis in tumors, and search for effective anti-cancer molecules. Our study indicates that small molecule alkaloid tetrandrine targets mRNA translation and inhibits proliferation of prostate cancer cells by interrupting signal transduction through PI3K-Akt-mTOR and PERK/p-eIF2α pathways. We have received evidence that PI3K is a molecular target for tetrandrine. Also, recently we began to study the mechanism and kinetics of the formation of alpha-synuclein fibrils, the main pathogenic components of Lewis bodies formed in Parkinson's disease.

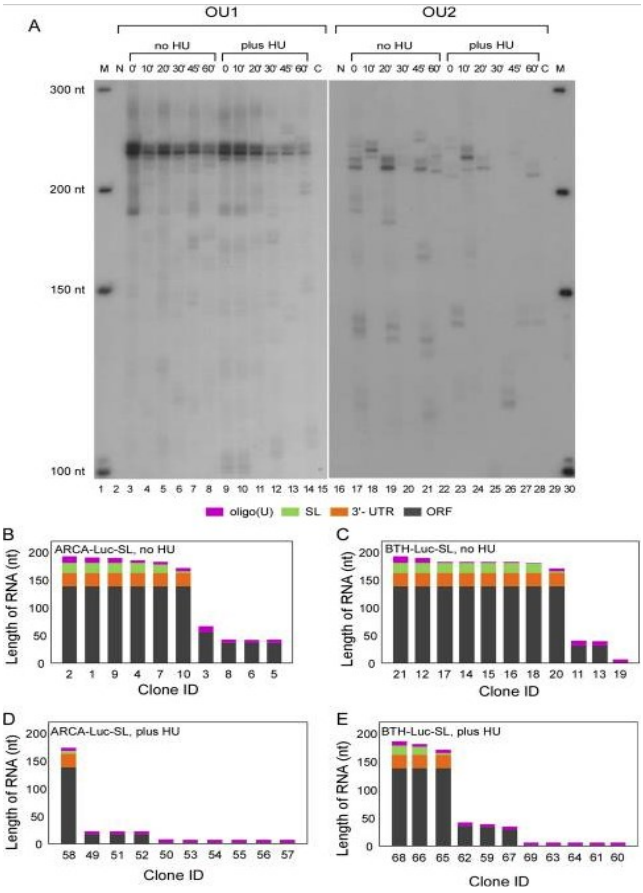
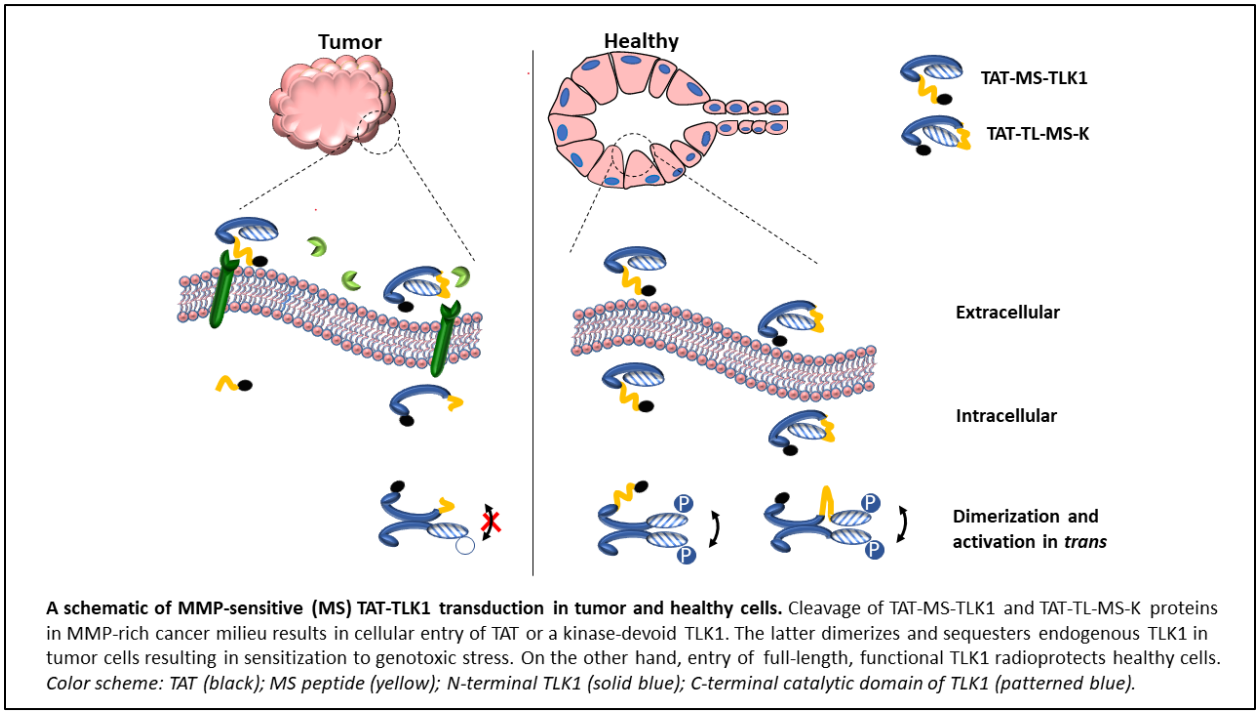


Figure 1. eIF4G(557–646) increases binding of eIF4E to m7GTP-Sepharose, but only if the eIF4E is purified from inclusion bodies of E. coli lysates. A, emission spectra of eIF4E purified from the soluble fraction. The degree of quenching of intrinsic Trp fluorescence at a saturating m7GTP concentration (1 μM) is shown. B, same as A except that eIF4E was purified from inclusion bodies. C, retention on m7GTP-Sepharose of eIF4E purified from the soluble fraction or from inclusion bodies. eIF4E (4 μM) purified as described under "Experimental Procedures" was incubated with m7GTP-Sepharose in the absence or presence of 4 μM eIF4G(557–646) for 2 h at 4 °C with constant rotation. The relative amount of eIF4E bound to the resin was estimated by densitometry after separation on 12% SDS-PAGE and silver-staining (43). Data obtained from three independent experiments are shown at the bottom

Gulshan Sunavala-Dossabhoy

Major Research Interests: Saliva and salivary gland function.

The main research thrust of the laboratory is to engineer therapeutics that alleviate complications of cancer therapies without the complications of normal tissue toxicity. Nearly all patients that undergo radiation for head-and-neck cancer and a substantial number of patients that undergo conditioning therapy prior to bone marrow transplantation suffer from the adverse effects of radiation namely, salivary hypofunction and oral mucositis. Rapidly proliferating normal epithelial cells of the oral cavity and fluid-producing cells of the salivary glands are acutely sensitive to radiation. Off target effects of regional cancer therapy result in poor salivary flow and painful oral ulcerations. The sequelae of rampant caries, oral infections, and difficulty in swallowing significantly impacts a patient's quality of life and the prospect of completing cancer treatment. Conventional palliative approaches are inadequate, and our work is to develop novel gene and protein therapies with minimal toxicity towards achieving a clinically translatable and sustainable solution. Previous work has shown that expression of a normal cellular variant of Tousled-like kinase 1 (TLK1) averts radiation-induced cell death in vitro. Importantly, gene transfer or direct protein delivery to salivary glands in vivo ameliorates radiation injury to salivary gland. Pertinent to clinical application, lasting gene expression suppresses a decline in salivary function despite repeated exposure to radiation. TLK1 facilitates DNA double-strand break repair, and our lab uncovered its role in homologous recombinational repair. Our aim, now, is to examine the contribution of TLK1 to cell survival and tissue regeneration and to develop TLK1 as a smart dual-purpose therapeutic that selectively preserves healthy cells while rendering tumor cells sensitive to cancer therapy.

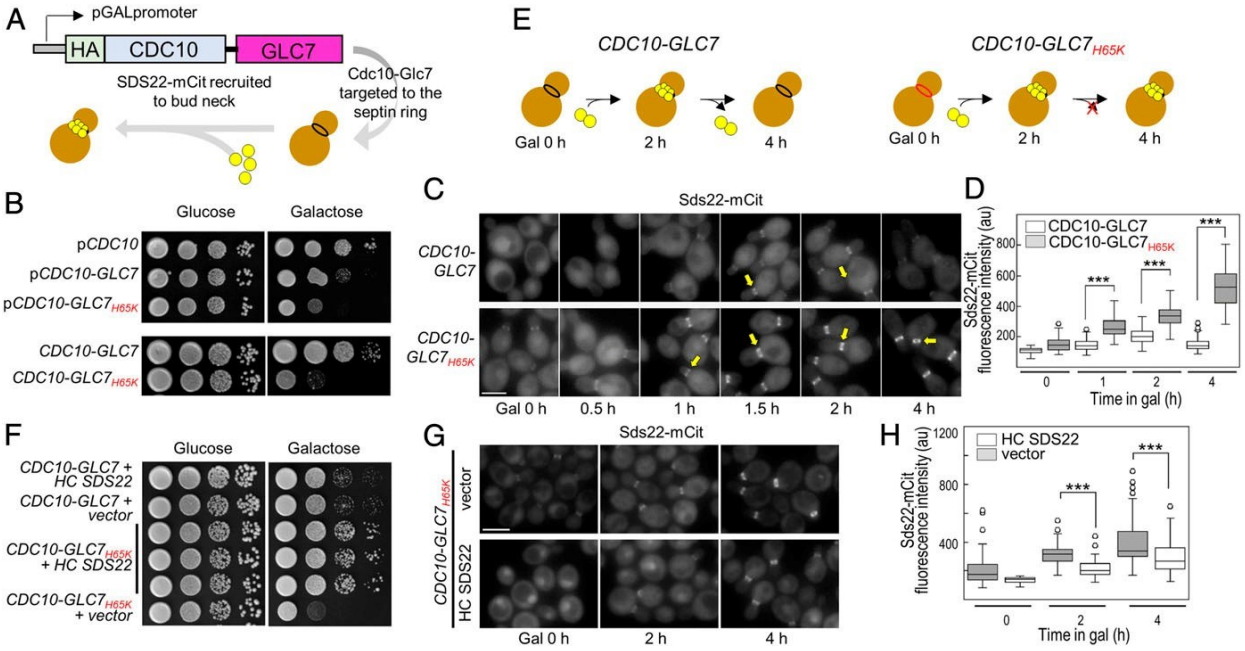


A schematic of MMP-sensitive (MS) TAT-TLK1 transduction in tumor and healthy cells. Cleavage of TAT-MS-TLK1 and TAT-TL-MS-K proteins in MMP-rich cancer milieu results in cellular entry of TAT or a kinase-devoid TLK1. The latter dimerizes and sequesters endogenous TLK1 in tumor cells resulting in sensitization to genotoxic stress. On the other hand, entry of full-length, functional TLK1 radioprotects healthy cells. *Color scheme: TAT (black); MS peptide (yellow); N-terminal TLK1 (solid blue); C-terminal catalytic domain of TLK1 (patterned blue).*

Kelly G. Tatchell

Major Research Interests: Type 1 protein phosphatase (PP1) in the yeast *Saccharomyces cerevisiae*

A primary interest in our laboratory is the type 1 protein phosphatase (PP1) in the yeast *Saccharomyces cerevisiae*. This evolutionarily conserved enzyme dephosphorylates phosphoserine and phosphothreonine residues on many proteins *in vitro* and has recently been shown to have a key regulatory role in physiological responses ranging from insulin-dependent activation of glycogen synthesis to the regulation of ion channels in the brain. The specificity of PP1 is determined by auxiliary subunits that regulate the activity of the phosphatase and target the enzyme to specific subcellular compartments. We are using a combination of genetic and biochemical strategies to identify these regulatory subunits. Our recent focus has been the PP1 activity that opposes the Aurora B protein kinase. This Aurora B protein kinase is essential for proper segregation of chromosomes at mitosis. We have found that cells lacking Aurora B kinase activity rapidly die from aneuploidy. We have recently completed a genetic screen to identify mutations that compensate for a reduction in Aurora B activity. Characterization of these mutants reveal novel mutations in the PP1 phosphatase activity that opposes Aurora B, mutations in microtubule-binding components of the kinetochore, mutations in a subunit of the Cdc48/p97 chaperone-like ATPase, and a mutation in a component of the Target of Rapamycin Complex 1 (TORC1). Our most recent suppressor mutant was identified by whole genome sequencing as a mutations in the gene encoding the E1 ubiquitin-activating enzyme, *UBA1*. This *uba1* mutant exhibits reduced levels of protein ubiquitylation and could act to suppress the Aurora B mutation by increasing Aurora B activity or by reducing the activity of PP1.



Stephan N. Witt

Major Research Interests: Alpha-Synuclein and Parkinson's disease; alpha-synuclein and melanoma; vesicle trafficking; molecular bases of disease.

We use several organisms (yeast, mice and human cells) to study the mechanism of toxicity of the human Parkinson disease-associated protein α-synuclein (α-syn). α-Syn is an intrinsically unfolded protein of unknown function that is the main protein component of Lewy bodies, which are proteinaceous cytoplasmic inclusions in dopamine-producing neurons in individuals who suffer from PD. High expression levels of α-syn or posttranslational modifications of the protein are thought to convert α-syn from a non-toxic protein into a toxic one. There is increasing evidence that the toxic conformation of α-syn is a prion: it acts as a template or seed that converts non-infectious α-syn monomers into infectious oligomers. Examples of ongoing projects include: (i) α-syn regulates Snx3-retromer recycling of cell surface iron import/export proteins; (ii) disruption of organelle-organelle contacts by α-syn; (iii) mechanism by which α-syn inhibits autophagy (see figure below); and (iv) viral parkinsonism.

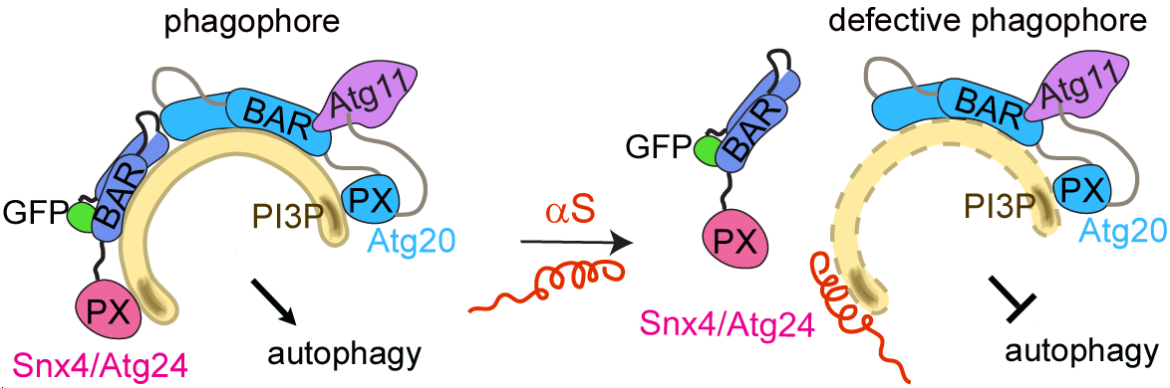
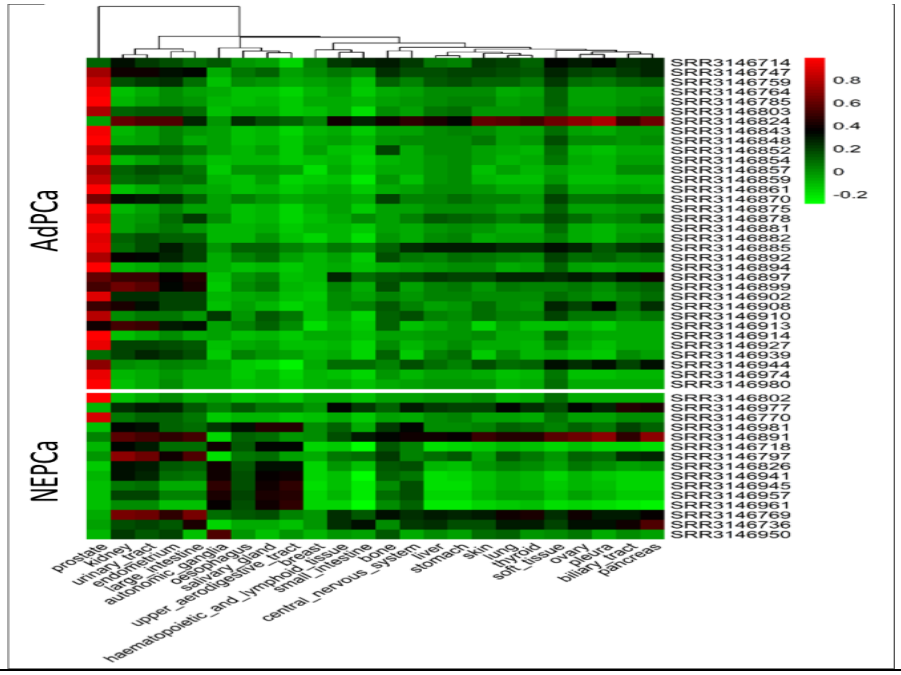


Illustration is our proposed model for how the Parkinson's disease-associated protein, alpha-synuclein, inhibits autophagy. We found that alpha-synuclein inhibits the binding of sorting nexin 4 (Snx4) to phagophores in *S. cerevisiae*. We propose that alpha-synuclein likely inhibits autophagy in yeast and human cells by blocking the binding of Snx4 to phagophores.

Xiuping Yu

Major Research Interests: To identify the mechanisms that drive castrate-resistant PCa and neuroendocrine PCa progression, specifically, to study the epigenetic alterations in advanced PCa and the roles of Wnt/beta-Catenin as well as Notch signaling pathway in PCa progression.

Androgen deprivation therapy has been the gold standard for treating advanced stage prostate cancer (PCa) since the 1960s. Initially, the PCa patients respond to hormone ablation very positively. However, over time these tumors almost always become resistant to androgen ablation therapy, and tumors begin to grow again. The development of new ways of providing androgen ablation has shown significant improvement for treating PCa patients who have failed hormonal therapy; however, these new anti-androgen therapy eventually fail. My major research interest is to study the mechanisms that promote castrate-resistant prostate cancer and the development of NEPCa. In the past year, we found that the expression of HOXB13, a homeobox protein that is primarily expressed in prostate, is lost in NEPCa. We have previously shown that Wnt/beta-Catenin signaling is involved in promoting PCa progression. We newly collected data supporting that the Wnt/beta-Catenin signaling is active in neuroendocrine PCa. We are now studying how this pathway is activated in advanced PCa. We found that loss of YAP1 activates Wnt/beta-Catenin signaling in PCa cells. We are presently studying the mechanisms that silence YAP1 expression and the downstream events of YAP1 loss. Based on our findings, we developed a model that describes the spectrum of epigenetic alterations during NE differentiation, which provides a guide to the field on the classification of NEPCa tumors. We are also investigating the role of stromal/epithelial interaction in the activation of Wnt signaling as well as the involvement of Notch signaling in NEPCa progression.



The loss of prostate specific HOX code in NEPCa tumors. Using the HOX genes' expression profile in 1019 cancer cell lines collected by CCLE, we established HOX codes for tissues from 24 different anatomic sites. We applied these HOX codes to a prostate cancer cohort that contains both prostate adenocarcinoma (AdPCa) and neuroendocrine prostate cancer (NEPCa) samples. We found that majority of the AdPCa tumors display high correlation with prostate specific HOX code, whereas majority of the NEPCa samples display low correlation. The loss of prostate specific HOX code in NEPCa suggests the loss of prostate tissue identity in these tumors.

Funded Grants, Contracts and Fellowships

Arrigo De Benedetti

AGENCY	PROJECT TITLE	ROLE	ANNUAL DIRECT COSTS	DATES OF ENTIRE PROJECT
DoD (PC160398)	Targeting the TLK1-NEK1 axis in PC	Principal Investigator	$199,031	15 Aug 17 – 15 Aug 20
FWCC Bridge Award	TLK1-MK5 Signaling Axis in Prostate Cancer Cell Motility and Invasion	Principal Investigator	$100,000	01 July 21 – 30 June 22

Eric A. First

AGENCY	PROJECT TITLE	ROLE	ANNUAL DIRECT COSTS	DATES OF ENTIRE PROJECT
Stiles Fund-LSUHS Center for Brain Health	Establishing a mouse model for Dominant Intermediate Charcot-Marie-Tooth Disorder (DI-CMTC)	Principal Investigator	$25,000	01 Jan. 20 – 30 June 21
FWCC Eastern Star	Developing novel cancer Therapeutics that target post-transfer editing in aminoacyl-tRNA synthetases	Principal Investigator	$10,000	01 July 21 – 30 June 22

David S. Gross

AGENCY	PROJECT TITLE	ROLE	ANNUAL DIRECT COSTS	DATES OF ENTIRE PROJECT
NIH R15 GM128065	Chromosomal Conformation and Nuclear Organization of Heat Shock Protein Genes	Principal Investigator	$100,000	01 May 18 – 30 April 21
NIH R15 Supplement GM128065-S1	Role of Actin in the Chromosomal Conformation and Nuclear Organization of HSP Genes	Principal Investigator	$30,000	01 May 19 – 30 April 21
NIH R01 GM138988	Genome Architecture and Gene Control in Response to Stress	Principal Investigator	$200,000	01 Aug 20 – 31 May 24

Shile Huang

AGENCY	PROJECT TITLE	ROLE	ANNUAL DIRECT COSTS	DATES OF ENTIRE PROJECT
LSUHSC-S/Ochsner-Collaborative Intramural Research Program (CIRP), LSUHSC-S	Inhibition of ATR enhances the anticancer activity of ciclopirox and immune check point blockade in renal cell carcinoma	Principal Investigator (Co-PI: Li Li, Ochsner)	$100,000	01 Jan 21 – 31 Dec 21
NIH/NIGMS	Louisiana Biomedical Research Network (LBRN)	Mentor	(10% salary)	01 May 21 – 30 Apr 24
NIH/NIGMS	Louisiana Biomedical Research Network (LBRN)	Mentor	(7% salary)	01 May 16 – 18 Aug 20

Sushil K. Jain

AGENCY	PROJECT TITLE	ROLE	ANNUAL DIRECT COSTS	DATES OF ENTIRE PROJECT
NIH/NCCIH	Optimization of blood levels of 25-hydroxyvitamin D in African Americans 1R33AT010637-01	Principal Investigator	$350,000	Sept 2020 – Aug 2023

Nancy Leidenheimer

AGENCY	PROJECT TITLE	ROLE	ANNUAL DIRECT COSTS	DATES OF ENTIRE PROJECT
LSUHSC-S	"GABAA receptor pi subunit in Colorectal cancer progression in Louisiana Patient Populations"	coPI w LiLi	$30,000	No cost ext through Sept 2021
FWCC	Role of the GABA shunt in Prostate cancer	Principal Investigator	$40,000	01 Jan 20 – 30 Jun 21

Brent C. Reed

AGENCY	PROJECT TITLE	ROLE	ANNUAL DIRECT COSTS	DATES OF ENTIRE PROJECT
Feist-Weiller Cancer Center, LSUHS	Use of GABA and GIPC as Targets for Combating Prostate Cancer Progression, HRM Group	Co-Principal Investigator	$6,000	01 July 18-30 June 19

Gulshan Sunavala-Dossabhoy

AGENCY	PROJECT TITLE	ROLE	ANNUAL DIRECT COSTS	DATES OF ENTIRE PROJECT
Biomedical Research Foundation	Developing a mechanism to restrict radioprotective TLK1 epression to normal salivary cells and not head and neck cancer cells	Principal Investigator	$10,000	01 July 19 – 30 Dec 20

Stephan N. Witt

AGENCY	PROJECT TITLE	ROLE	ANNUAL DIRECT COSTS	DATES OF ENTIRE PROJECT
NIH/NIGMS	The role of alpha-synuclein in Snx3-retromer mediated recycling of membrane proteins	Principal Investigator	$100,000	1 Dec 18-30 Nov 21

Xiuping Yu

AGENCY	PROJECT TITLE	ROLE	ANNUAL DIRECT COSTS	DATES OF ENTIRE PROJECT
NIH	Androgen Deprivation Activates Wnt/Beta-Catenin Signaling in Prostate Cancer	Principal Investigator	$250,000	01 July 18 – 30 June 23
DOD	The TLK1/NEK1 axis in prostate cancer	Co-Principal Investigator	(10% effort and salary)	15 Aug 17 – 14 Aug 20

Publications
Research Articles Published in Refereed Journals

Arrigo De Benedetti

Khalil, MD.I., Ghosh, I., Singh, V., Chen, J., Haining, Z., and De Benedetti, A. (2020) NEK1 phosphorylation of YAP promotes its stabilization and transcriptional output. MDP1-Cancers 12(12)3666 https://doi.org/10.3390/cancers12123666

Singh, V., Bhoir, S., Chikhale, R.V., Hussain, J., Dwyer, D., Bryce, R.A., Kirubakaran, S., and De Benedetti, A. (2020) Generation of Phenothiazine with Potent anti-TLK1 Activity for Prostate Cancer Therapy . iScience.I:https://doi.org/10.1016/j.isci.2020.101474

Shile Huang

Luo J[#], Odaka Y[#], Huang Z[#], Cheng B, Liu W, Li L, Shang C, Zhang C, Wu, Y, Luo Y, Yang S, Houghton PJ, Guo X*, Huang S* (2021) Dihydroartemisinin Inhibits mTORC1 Signaling by Activating the AMPK Pathway in Rhabdomyosarcoma Tumor Cells. *Cells. 10*:1363. PMID: 34205996; PMCID: PMC8226784.

Chen Y, Hu J, Liu S, Chen B, Zhao Z, Liao Y, Xiao M, Li Y, Ouyang J, Rai KR, Zhang L, Liu W, Huang S, Chen JL (2021) RDUR, a lncRNA, promotes innate antiviral response and provides feedback control of NF-κB activation. *Front Immunol*. 12:672165. PMID: 34054851; PMCID: PMC8160526.

Xu C, Chen S, Xu M, Chen X, Wang X, Zhang H, Dong X, Zhang R, Chen X, Gao W, Huang S*, Chen L*. (2021) Cadmium Impairs Autophagy Leading to Apoptosis by Ca^{2+}-Dependent Activation of JNK Signaling Pathway in Neuronal Cells. *Neurochem Res*. 46:2033-2045. PMID: 34021889

Chen X, Ma J, Yao Y, Zhu, J, Zhou Z, Zhao R, Dong X, Gao W, Zhang S, Huang S*, Chen L* (2021) Metformin prevents BAFF activation of Erk1/2 from B-cell proliferation and survival by impeding mTOR-PTEN/Akt signaling pathway. *Int Immunopharmacol*. 96:107771. PMID: 34004440

Ni W, Hui F, Zheng X, Xu F, Wu Y, Li X, Wang A, Huang S, Chen W, Wang S, Lu Y (2021) Cryptotanshinone Inhibits ERα-dependent and -independent BCRP Oligomer Formation to Reverse Multidrug Resistance in Breast Cancer. *Front Oncol*. 11:624811. PMID: 33968724; PMCID: PMC8100513

Shekoohi S, Rajasekaran S, Patel D, Yang S, Liu W, Huang S, Yu X, Witt SN (2021) Knocking out alpha-synuclein in melanoma cells dysregulates cellular iron metabolism and suppresses tumor growth. *Sci Rep.* 11:5267. PMID: 33664298; PMCID: PMC7933179

Luo J, Zhang Y, Wang Y, Liu Q, Li S, He H, Luo Y, Huang S*, Guo X* (2021) Artesunate and dihydroartemisinin inhibit rabies virus replication. *Virol Sin.* 4:1-9. PMID: 33661488; PMCID: PMC7930525

Liu S, Liao Y, Chen B, Chen Y, Yu Z, Wei H, Zhang L, Huang S, Rothman PB, Gao GF, Chen JL (2021) Critical role of Syk-dependent STAT1 activation in innate antiviral immunity. *Cell Rep*. 34:108627. PMID: 33472080

Wang Q, Pan W, Wang S, Pan C, Ning H, Huang S, Chiu SH, Chen JL (2021) Protein tyrosine phosphatase SHP2 suppresses host innate immunity against influenza A virus through regulating EGFR-mediated signaling. *J Virol*. 95:e02001-20. PMID: 33361428

Luo J, Zhang Y, Wang Y, Liu Q, Chen L, Zhang B, Luo Y, Huang S, Guo X (2020) Rhabdovirus Infection Is Dependent on Serine/Threonine Kinase AP2-Associated Kinase 1. *Life (Basel).* 10:170. PMID: 32872567; PMCID: PMC7554979

Sushil K. Jain

Jain SK, Parsanathan R. Can Vitamin D and L-Cysteine Co-Supplementation Reduce 25(OH)-Vitamin D Deficiency and the Mortality Associated with COVID-19 in African Americans? J Am Coll Nutr. 2020 Nov-Dec;39(8):694-699. PMID: 32659175.

Jain SK, Parsanathan R, Levine SN, Bocchini JA, Holick MF, Vanchiere JA. The potential link between inherited G6PD deficiency, oxidative stress, and vitamin D deficiency and the racial inequities in mortality associated with COVID-19. Free Radic Biol Med. 2020 Dec;161:84-91. PMID: 33038530.

Parsanathan R, Jain SK. Glucose-6-Phosphate Dehydrogenase Deficiency Activates Endothelial Cell and Leukocyte Adhesion Mediated via the TGFβ/NADPH Oxidases/ROS Signaling Pathway. Int J Mol Sci. 2020 Oct 10;21(20):7474. PMID: 33050491.

Parsanathan R, Achari AE, Manna P, Jain SK. l-Cysteine and Vitamin D Co-Supplementation Alleviates Markers of Musculoskeletal Disorders in Vitamin D-Deficient High-Fat Diet-Fed Mice. Nutrients. 2020 Nov 6;12(11):3406. PMID: 33171932.

Jain SK, Micinski D, Parsanathan R. l-Cysteine Stimulates the Effect of Vitamin D on Inhibition of Oxidative Stress, IL-8, and MCP-1 Secretion in High Glucose Treated Monocytes. J Am Coll Nutr. 2021 May-Jun;40(4):327-332. PMID: 33596158.

Nancy Leidenheimer

Erika L Knott , Nancy J Leidenheimer, A Targeted Bioinformatics Assessment of Adrenocortical Carcinoma Reveals Prognostic Implications of GABA System Gene Expression. Int J Mol Sci, 2020 Nov 11;21(22):8485. doi: 10.3390/ijms21228485.

Lucy C. Robinson

Schnell HM, Jochem M, Yagmur, Micoogullari C, Riggs L, Ivanov P, Welsch H, Ravindran R, Anderson P, Robinson LC, Tatchell K, Hanna J. (2021) Reg1 and Snf1 Regulate Stress-Induced Relocalization of Protein Phosphatase-1 to Cytoplasmic Granules. FEBS J. 2021 Mar 7. doi: 10.1111/febs.15802. Online ahead of print. PMID: 33682330

Gulshan Sunavala-Dossabhoy

Sunavala-Dossabhoy G, Spielman AI. Restructuring dental education in a post-COVID-19 era. Oral Diseases. 2020; doi: 10.1111/odi.13580.

Sunavala-Dossabhoy G. Renin-Angiotensin II-Aldosterone axis in SARS-CoV-2-associated xerostomia. Oral Diseases. 2020; 10.1111/odi.13594. doi: 10.1111/odi.13594.

Sunavala-Dossabhoy G, Spielman AI. Pandemics and education: a historical perspective. J Dent Educ 2021; 85: 741– 746. doi: 10.1002/jdd.12615.

Stephan N. Witt

Shekoohi S, Rajasekaran S, Patel D, Yang S, Liu W, Huang S, Yu X, Witt SN. Knocking out alpha-synuclein in melanoma cells dysregulates cellular iron metabolism and suppresses tumor growth. Sci Rep. 2021 Mar 4;11(1):5267. PMID:33664298

Xiuping Yu

Abdullah CS, Aishwarya R, Alam S, Morshed M, Remex NS, Nitu S, Kolluru GK, Traylor J, Miriyala S, Panchatcharam M, Hartman B, King J, Bhuiyan MAN, Chandran S, Woolard MD, Yu X, Goeders NE, Dominic P, Arnold CL, Stokes K, Kevil CG, Orr AW, Bhuiyan MS. Methamphetamine induces cardiomyopathy by Sigmar1 inhibition-dependent impairment of mitochondrial dynamics and function. Commun Biol. 2020 Nov; 3(1): 682. PMID: 33203971.

Kohrt SE, Awadallah WN, Phillips RA, Case TC, Jin R, Nanda JS, Yu X, Clark PE, Yi Y, Matusik RJ, Anderson PD, Grabowska MM. Identification of genes required for enzalutamide resistance in castration-resistant prostate cancer cells in vitro. Mol Cancer Ther. 2020 Dec; [Epub ahead of print] PMID: 33298586.

Cheng S, Prieto-Dominguez N, Yang S, Connelly ZM, StPierre S, Rushing B, Watkins A, Shi L, Lakey M, Baiamonte LB, Fazili T, Lurie A, Corey E, Shi R, Yeh Y, Yu X. The Expression of YAP1 Is Increased in High-Grade Prostatic Adenocarcinoma but Is Reduced in Neuroendocrine Prostate Cancer. Prostate Cancer Prostatic Dis. 2020 Dec;23(4):661-669. PMID: 32313141.

Connelly ZM, Jin R, Zhang J, Yang S, Cheng S, Shi M, Cates JM, Shi R, DeGraff DJ, Nelson PS, Liu Y, Morrissey C, Corey E, Yu X. FOXA2 promotes prostate cancer growth in the bone. Am J Transl Res. 2020 Dec;12(9): 5619-5629. PMID: 33042443.

Cheng S, Yang S, Shi Y, Shi R, Yeh Y, Yu X. Neuroendocrine prostate cancer has distinctive, non-prostatic HOX code that is represented by the loss of HOXB13 expression. Sci Rep. 2021 Feb 2;11(1):2778. PMID: 33531604

Shekoohi S, Rajasekaran S, Patel D, Yang S, Liu W, Huang S, Yu X, Witt S. Knocking out alpha-synuclein in melanoma cells dysregulates cellular iron metabolism and suppresses tumor growth. Sci Rep. 2021 Mar 4;11(1):5267. PMID: 33664298

Cheng S, Yu X. The spectrum of neuroendocrine differentiation in prostate cancer Prostate Cancer Prostatic Dis 2021 May 18. doi: 10.1038/s41391-021-00386-5.Online ahead of print

Books, Book Chapters, and Review Articles

David S. Gross

Kainth A.S., Chowdhary S., Pincus, D. and *Gross D.S*. 2021. Primordial Super-Enhancers: Heat Shock-Induced Chromatin Organization. *(Invited Opinion Article) Trends Cell Biol.* **31:** published online May 2021.

Shile Huang

Li L, Huang S* (2021) SARS-CoV-2 M^{pro} inhibitors with antiviral activity in a transgenic mouse model. *Signal Transduct Target Ther*. 6:138. PMID: 33790219

Klionsky DJ, et al. (2021). Guidelines for the use and interpretation of assays for monitoring autophagy (4th edition). *Autophagy*. 2021 Feb 8:1-382. Online ahead of print. PMID: 33634751

Huang Z, Huang S* (2021) Reposition of the Fungicide Ciclopirox for Cancer Treatment. *Recent Pat Anticancer Drug Discov*. 2021 Feb 10. Online ahead of print. PMID: 33573561

Sohretoglu D*,* Arroo R, Sari S, Huang *S (2021)* Flavonoids as Inducers of Apoptosis and Autophagy in Breast Cancer. In "*Discovery and Development of Anti-Breast Cancer Agents from Natural Products*" (Ed. Goutam Brahmachari), Elsevier, Amsterdam, Netherlands. Chapter 7, pp.147-196. https://doi.org/10.1016/B978-0-12-821277-6.00007-6.

Huang S (2020) "mTOR Signaling in Metabolism and Cancer", ISBN 978-3-03943-553-1 (Hbk), ISBN 978-3-03943-554-8 (PDF), https://doi.org/10.3390/books978-3-03943-554-8**,** MDPI, Basel, Switzerland.

Huang S (2020) mTOR Signaling in Metabolism and Cancer. *Cells*. 9:2278. PMID: 33065976

Presentations
Meetings Attended and Papers Presented

Arrigo De Benedetti

Imtiaz Khalil, Ishita Ghosh, Vibha Singh, Jing Chen, Z. Haining, and Arrigo De Benedetti (2020) *NEK1 phosphorylation of YAP promotes its stabilization and transcriptional output.* – AACR 2021

Ishita Ghosh, Youngho Kwon, Jing Chen, Platon Selemenakis, Claudia Wiese, Patrick Sung, and Arrigo De Benedetti . TLK1 *phosphorylates RAD54 to promote homology driven DSB repair* – AACR 2021

Eric A. First

The virtual annual meeting of American Society for Biochemistry and Molecular Biology, April 27-30, 2021

Shile Huang

Li L, Luo Y, Liu L, Jaiswal P, Koul HK, Huang S (2021) mTORC1 regulates cell migration through PP5 and PP2A. Graduate Research Day, Louisiana State University Health Sciences Center, Shreveport, LA, May, 2021

Li L, Huang S (2021) Protein phosphatase 5 regulation of cell motility. *The Virtual Annual Meeting of American Association for Cancer Research*, April 10-15, 2021

Gulshan Sunavala-Dossabhoy

American Society of Cell and Gene Therapy virtual meeting – Professional Development Series, April 16, 2021

Stephan N. Witt

Graduate Research Day at LSUHSC in Shreveport. April 27, 2021. Poster: "Knocking out alpha synuclein causes decreased release of extracellular vesicles in melanoma cells" Nirjhar M. Aloy, Michael W. Graner, and Stephan N. Witt

Xiuping Yu

Siyuan Cheng, Shu Yang, Yingli Shi, Runhua Sh, Yunshin Yeh, Xiuping Yu Reduced HOXB13 expression in neuroendocrine prostate cancer represents a loss of prostate identity. SBUR annual meeting, November, 2020, virtual

Siyuan Cheng, Shu Yang, Yingli Shi, Runhua Sh, Yunshin Yeh, Xiuping Yu Neuroendocrine cancer cells have changed HOX code during trans-differentiation. AACR annual meeting, April 2020, virtual

Siyuan Cheng, Shu Yang, Xiuping Yu Identification of mechanisms that promote neuroendocrine prostate cancer progression, LSU Graduate Research Day May, 2021

Invited Seminars

Shile Huang

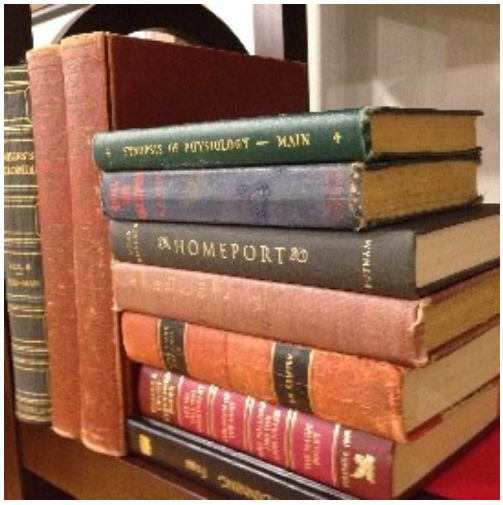
Repositioning the fungicide ciclopirox for cancer therapy. Ochsner Clinic Foundation, New Orleans, LA, February 10, 2021. [host: Dr. Li Li].

Xiuping Yu

"Neuroendocrine prostate cancer progression" at Prostate Cancer Foundation, February 2020, virtual

Teaching

Lecture Courses Taught in 2020-2021



School of Medicine

MODULE	TOPICS TAUGHT	DIRECTORS
I	Core Concepts in the Basic Sciences	Sumitra Miriyala
I	Physiological Chemistry, Medical Genetics, and Developmental Biology	Eric First
I	Cellular Structure and Function; Physiological and Pharmocological Processes	Mani Panchatcharam
I	Mechanisms of Disease and Host Defenses	Robert Chervenak
II	Musculoskeletal System	Miriyala Sumitra and Mamatha Katikaneni
II	Medical Neuroscience	Chris Schmoutz
II	Blood and Lymph	Ellen Friday
II	Endocrine and Reproductive Systems	David Scarborough
II	Integrative Processes	David Scarborough

School of Graduate Studies

COURSE		CR	TOPICS TAUGHT	DIRECTORS
Biochemistry	224	1	Biochemistry of Metabolism	Brent Reed
Biochemistry	282	1	Protein Structure and Function	Eric First
Biochemistry	283	1	Molecular Mechanisms of Transcription Control	David Gross
Interdisciplinary	110	3	Basic Biochemistry: Molecular & Cellular Biology I	Brent Reed
Interdisciplinary	113	1	Genetics	Kenneth Peterson
Interdisciplinary	116	1	Methods in Biomedical Sciences: Biochemical & Molecular Methods	Donard Dwyer
Interdisciplinary	117	1	Methods in Biomedical Sciences: Recombinant DNA & Cell Biology	Rona Scott
Interdisciplinary	118	3	Cell Biology	Shile Huang
Interdisciplinary	119	1	Gene Expression	David Gross
Interdisciplinary	201	2	Introduction to Human Cancer-Research, Treatment, & Prevention	Jason Bodily
Interdisciplinary	202	1	Mechanisms of Cancer Invasion and Metastasis.	Shile Huang
Interdisciplinary	203	0.5	Discussions in Cancer Biology	Jason Bodily
Interdisciplinary	212	1.5	Foundations of Biomedical Sciences I – Cardiovascular System	Steven Alexander
Interdisciplinary	213	1	Foundations of Biomedical Sciences I – Renal System	Karen Stokes
Interdisciplinary	214	1	Foundations of Biomedical Sciences I – Respiratory System	Christopher Pattillo
Interdisciplinary	216	1	Foundations of Biomedical Sciences II - Gastrointestinal System	Ana Dragoi
Interdisciplinary	217	1	Foundations in Biomedical Sciences: Endocrine Systems	Diana Cruze-Topete
Interdisciplinary	218	1.5	Foundations of Biomedical Sciences: Nervous System	Elizabeth Disbrow
Interdisciplinary	219	1	Foundations of Biomedical Sciences: Inflammation, Immunity, Infection, and Cancer	Martin Muggeridge
Interdisciplinary	226	1	Basic Biostatistics	Elizabeth Disbrow
Interdisciplinary	227	1	Advanced Biostatistics	Clif Frilot
Interdisciplinary	230	1	Advances in Gene Therapy	Xiao-Hong Lu & Shile Huang
Interdisciplinary	235	1	Grant Writing	Andrew Yurochko
Interdisciplinary	240	1	Philosophical and Ethical Issues in Science	Kelly Tatchell
Interdisciplinary	250	1	Current Trends in Toxicology	Kenneth McMartin

Faculty Participation in Course

Arrigo De Benedetti

COURSE	CONTACT HOURS	TOPICS TAUGHT
Interdisciplinary 110	11	Lipids and Membranes; nucleic acids structure/function chromatin; DNA and RNA metabolism; DNA replication; Protein Synthesis (prokaryotes and eukaryotes)
Interdisciplinary 113	2	DNA damage and repair
Biochemistry 224	2	Nucleotides metabolism
Interdisciplinary 119	2	Eukaryotic translational mechanisms
Interdisciplinary 201	4	DNA damage and repair in Cancer

Eric A. First

COURSE	CONTACT HOURS	TOPICS TAUGHT
Interdisciplinary 116	2	X-ray crystallography
Interdisciplinary 226	2	Hypothesis testing
Interdisciplinary 227	1	Advanced hypothesis testing
Biochemistry 282	16	Protein structure
Module I, Course 1	17	Bioenergetics; proteins; enzyme kinetics, metabolism
Module I	16	Small-group mentor

David S. Gross

COURSE	CONTACT HOURS	TOPICS TAUGHT
Interdisciplinary 110	8	Basic concepts in gene transcription; Bacterial gene regulation; Chromatin structure and function; RNA capping, pre-mRNA splicing, pre-mRNA 3'-end formation; RNA editing; basic principles of epigenetic gene regulation.
Interdisciplinary 119	9	Eukaryotic gene regulatory mechanisms; eukaryotic transcription factors; RNAi-mediated chromatin silencing; lncRNA structure and function; embryonic stem cell gene regulation; transcriptional control of erythroid cell differentiation; steroid hormone-mediated gene regulation.

Shile Huang

COURSE	CONTACT HOURS	TOPICS TAUGHT
Interdisciplinary 118	6	Non-receptor tyrosine kinase (1); MAPK cascade (1); TOR signaling and growth control (1); Mechanism of cell division, cell cycle control, mitosis, cytokinesis (3)
Interdisciplinary 201	4	Cancer and cell cycle deregulation (2); Signal transduction (2)
Module I, Course 1	1	Carbohydrate structure (1)
Module I, Course 2	3	Cell cycle; Vitamin A and photo transduction (1)
Module I	16	Small-group mentor

Nancy Leidenheimer

COURSE	CONTACT HOURS	TOPICS TAUGHT
Interdisciplinary 217	3	Thyroid and antithyroid drugs; drugs acting on the female reproductive system; drugs affecting uterine motility/teratogenesis
Interdisciplinary 218	1	Neurotransmission: amino acids
Interdisciplinary 204	2	Human Protein Atlas; Pharmacogenomics
Module II, Course 1	1	Steroidal anti-inflammatory drugs
Module II, Course 2	1	Anticonvulsants
Module II, Course 11	3	Thyroid pharmacology; reproductive pharmacology; pharmacology of labor/teratogenesis
Module I, Course 2	2	Amino Acid Metabolism
Foundations FCM	2	Integrative medicine
Pharmacology 233	2	Anticonvulsants
Pharmacology 209	1	Introduction to Research in Pharmocology
Animal Models IDSP 123	2	Epilepsy Models
Pharmacology 260	2	Pharmacological chaperones

Brent C. Reed

COURSE	CONTACT HOURS	TOPICS TAUGHT
Interdisciplinary 110	7	Introduction to thermodynamics and metabolism; enzyme kinetics; mechanisms of catalysis; enzyme regulation
Interdisciplinary 116	1	Isotopic labeling; metabolic labeling
Interdisciplinary 117	2	Protein-protein interactions
Module I	7	Lipid Structure I & II; Lipid metablism I & II; lipoproteins I & II; ecosinoids
Biochemistry 224	6	Membrante transport; fatty acid biosynthesis and degradation; metabolism of cholesterol; integration of metabolism; hormone action
Biochemistry 287	7	Introduction to diverse microscope technologies, introduction to image processing using FIJI, and specific image processing techniques
Small Groups	26/3	Discussion with medical students, the weekly case presentation

Lucy C.Robinson

COURSE	CONTACT HOURS	TOPICS TAUGHT
Foundations of Clinical Medicine FLG	16	Small-group facilitator
Foundations of Clinical Medicine I Immersion	4	Small-group facilitator
Interdisciplinary 110	3	Carbohydrates I, II and Glycoproteins
Interdisciplinary 124	9	Metabolism Overview I,II; Gluconeogenesis; Pentose phosphate pathway; Glycogen metabolism I,II; Amino acid metabolism I-III
Interdisciplinary 116	4	Eletrophoresis I, II; Proteomics I,II
Interdisciplinary 117	1	DNA sequencing
Module I, Course 1	6	Protein synthesis I,II; Protein targeting and glycosylation; Molecular techniques in medicine I, II; Biochemical Nutrition I
Module I Small Group	16	Small-group facilitator

Gulshan Sunavala-Dossabhoy

COURSE	CONTACT HOURS	TOPICS TAUGHT
Interdisciplinary 119	1.5	Post-transcriptional gene regulation

Kelly Tatchell

COURSE	CONTACT HOURS	TOPICS TAUGHT
Interdisciplinary 113	4	Cell nucleus; eukaryotic genetics; DNA recombination in eukaryotes
Interdisciplinary 118	11	Cytoskeleton; nuclear-cytoplasmic transport, cell cycle
Interdisciplinary 240A	1	Ethics in scientific collaboration
Interdisciplinary 240A	1	Scientific Misconduct
Module I, Course 1	2	Protein modification, protein degradation
Module I, Course 2	8	Cytoskeleton; autophagy
Module I, Course 3	1	Overview of Cell Physiology

Stephan N. Witt

COURSE	CONTACT HOURS	TOPICS TAUGHT
Interdisciplinary 111	12	Acids and bases; amino acids; proteins; protein folding and evolution

Xiuping Yu

COURSE	CONTACT HOURS	TOPICS TAUGHT
Interdisciplinary 123	8	Animal Models in Translational Research
Interdisciplinary 201	8	Introduction to Human Cancer
Interdisciplinary 204	2	Practical Bioinformatics course
Module I, Course 1	12	Biochemistry
Module I, Course 4	3	Cancer Biology

The Graduate Program

Students in the Program during 2020-2021

NAME	UNIVERSITY	DEGREE	MAJOR
Mohammed Alam	University of Chittagong	B.Sc.	Microbiology
	Western Illinois University	M.Sc.	Biological Sciences
Shawn Allen	Brigham Young University	B.Sc.	Chemistry
Nirjhar Aloy	Rajshahi Medical College	B.Sc.	Medicine
Siyuan Cheng	Hunan University	B.Sc.	Biotechnology
Ishita Ghosh	University of Calcutta	B.Sc.	Biochemistry
	University of Calcutta	M.Sc.	Biochemistry
Imtiaz Khalil	University of Dhaka	B.Sc.	Zoology
	Western Illinois University	M.Sc.	Biology
Erika Knott	Mississippi State University	B.Sc.	Biochemistry
	University of Alabama in Huntsville	M.Sc.	Biological Sciences
Lin Li	Hunan University	B.Sc.	Biotechnology
Christopher Madere	Louisiana State University-Shreveport	B.Sc.	Biochemistry
	Louisiana State University-Shreveport	B.Sc.	Cell & Molecular Biology
	Louisiana State University-Shreveport	M.Sc.	Biological Sciences
Suman Mohajan	University of Chittagong	B.Sc.	Biochemistry
	University of Chittagong	M.Sc.	Biochemistry
Vickky Pandit	Poona College of Pharmacy	B.Sc.	Pharmacy
	Nottingham Trent University	M.Sc.	Pharmacology
Linda Rubio	Louisiana State University-Alexandria	B.Sc.	Biology
Sahar Shekoohi	Zabol University of Medical Sciences	B.Sc.	Midwifery
	Mashhad University of Medical Sciences	M.Sc.	Human Genetics

M.S. and Ph.D. Supervisory Committees

A significant proportion of faculty time is spent advising graduate students as they pursue their masters and doctoral research. This activity is formalized in the existence of Supervisory Committees for each graduate student. Committees meet every six months to determine progress and advise changes in research directions if necessary. Below is listed the committees on which each Departmental faculty member served in 2020-2021.

Arrigo De Benedetti	Ishita Ghosh	Biochemistry & Molecular Biology
	Imtiaz Khalil	Biochemistry & Molecular Biology
	Christopher Madere	Biochemistry & Molecular Biology
	Linda Rubio	Biochemistry & Molecular Biology
	Sahar Shekoohi	Biochemistry & Molecular Biology
	Vickky Pandit	Biochemistry & Molecular Biology
	Lin Li	Biochemistry & Molecular Biology
	Suman Mohajan	Biochemistry & Molecular Biology
	Nirjhar Aloy	Biochemistry & Molecular Biology
	Erika Knott	Biochemistry & Molecular Biology
Eric A. First	Imtiaz Khalil	Biochemistry & Molecular Biology
David S. Gross	Ishita Ghosh	Biochemistry & Molecular Biology
	Christopher Madere	Biochemistry & Molecular Biology
	Suman Mohajan (Chair)	Biochemistry & Molecular Biology
	Vickky Pandit (Chair)	Biochemistry & Molecular Biology
	Linda Rubio (Chair)	Biochemistry & Molecular Biology
	Joseph Eniafe	Microbiology & Immunology
Shile Huang	Nirjhar Aloy	Biochemistry & Molecular Biology
	Siyuan Cheng	Biochemistry & Molecular Biology
	Angelic Holston	Pharmacology, Toxicology & Neuroscience
	Lin Li (Chair)	Biochemistry & Molecular Biology
	Imtiaz Khaili	Biochemistry & Molecular Biology
	Christopher Madere	Biochemistry & Molecular Biology
	Sahar Shekoohi	Biochemistry & Molecular Biology
Nancy Leidenheimer	Suman Mohajan	Biochemistry & Molecular Biology
	Erika Knott (Chair)	Biochemistry & Molecular Biology
	Lailun Nahar	Pharmacology, Toxicology & Neuroscience
	Alicia Thomas	Pharmacology, Toxicology & Neuroscience
Brent Reed	Siyuan Cheng	Biochemistry & Molecular Biology

Lucy C. Robinson	Lin Li	Biochemistry & Molecular Biology
	Jessica Trammel	Microbiology & Immunology
	Linda Rubio-Rubio	Biochemistry & Molecular Biology
	Bailey Mosher	Microbiology & Immunology
	Siyuan Cheng	Biochemistry & Molecular Biology
Kelly G. Tatchell	Kellie Brown	Microbiology & Immunology
	Patrick Gellings	Microbiology & Immunology
	Ishita Ghosh	Biochemistry & Molecular Biology
	Amoldeep Kainth	Biochemistry & Molecular Biology
	Julia Myers	Microbiology & Immunology
	Sadie Rice	Microbiology & Immunology
	Linda Rubio	Biochemistry & Molecular Biology
	Vickky Pandit	Biochemistry & Molecular Biology
Stephan N. Witt	Heather Fulkerson	Microbiology & Immunology
	Sahar Shekoohi (Chair)	Biochemistry & Molecular Biology
	Erika Knott	Biochemistry & Molecular Biology
Xiuping Yu	Erika Knott	Biochemistry & Molecular Biology
	Sahar Shekoohi	Biochemistry & Molecular Biology
	Ishita Ghosh	Biochemistry & Molecular Biology
	Imtiaz Khalil	Biochemistry & Molecular Biology
	Vickky Pandit	Biochemistry & Molecular Biology
	Lin Li	Biochemistry & Molecular Biology
	Nirjhar Aloy	Biochemistry & Molecular Biology
	Siyuan Cheng (Chair)	Biochemistry & Molecular Biology
	Zobair Alam (Chair)	Biochemistry & Molecular Biology
	Shawn Allen (Chair)	Biochemistry & Molecular Biology

Special Awards, Honors, and Recognition

Congratulations to Imtiaz Khalil, who was awarded 1st place in Research Posters Presentation Senior category in May 2021 in Graduate Research Day at Louisiana State University Health Sciences Center-Shreveport

Congratulations to Dr. Arrigo De Benedetti – Presidential Citation at the 10th AHNS International Conference

Congratulations to Dr. David Gross of the invitation to contribute opinion piece in his lab's research to *Trends in Cell Biology*; published online May 2021.

Students Receiving M.S. or Ph.D. Degree in the 2020-21 Academic Year

STUDENT	MENTOR	THESIS TITLE
Christopher Madere, M.S.	Arrigo De Benedetti	Interaction of TLK1 and AKTIP as a potential regulator of AKT
Erika Knott, Ph.D.	Nancy J. Leidenheimer	Bioinformatics & functional data strongly implicate the GABA system in cancer progression
Sahar Shekoohi, Ph. D.	Stephan N. Witt	Knocking out alpha-synuclein in melanoma cells dysregulates cellular iron metabolism and suppresses tumor growth

The 2020-2021 Seminar Program

September 3	Erika Knott, Graduate Assistant, Biochemistry & Molecular Biology LSUHS	ABAT as a Novel Target for Drug Development in Adrenocortical Carcinoma: A Bioinformatics Assessment
September 17	Linda Rubio, Graduate Assistant, Biochemistry & Molecular Biology LSUHS	What is Action Doing during Heat Shock?
October 8	Xiuping Yu, Ph.D. Associate Professor, Biochemistry & Molecular Biology, LSUHS	Neuroendocrine Prostate Cancer Progression
October 15	Xin Lu, Ph.D. John M. & Mary Jo Boler Assistant Professor, Department of Biological Sciences Center for Rare & Neglected Diseases, Harper Cancer Research Institute University of Notre Dame, Indiana	Immunosuppression and Combination Immunotherapy in GU malignancies
November 5	Krista Rodgers, Ph.D. Assistant Professor, Cellular Biology & Anatomy, LSUHS	Neuronal Replacement from Endogenous Precursors Following Cerebral Ischemia
November 12	Suman Mohajan, Graduate Assistant, Biochemistry & Molecular Biology, LSUHS	Transcription and 3D Genome Architecture in Response to Heat Stress
November 19	Siyuan Cheng, Graduate Assistant, Biochemistry & Molecular Biology, LSUHS	Neuroendocrine Prostate Cancer Progression
December 3	Lin Li, Graduate Assistant, Biochemistry & Molecular Biology, LSUHS	The Mechanism of PP5 Regulating Cell Migration
December 10	Jeremy Kamil, Ph.D. Associate Professor, Microbiology & Immunology, LSUHS	Evidence for a New Cytomegalovirus Glycoprotein Complex
December 17	Nirjhar Aloy, Graduate Assistant, Biochemistry & Molecular Biology LSUHS	TBA
January 7	Subair Karim, Ph.D. School of Pharmacy, UT El Paso	A Complex Interplay in Secretory Machinery
January 14	Pooja Jadiya, Ph.D. Lewis Katz School of Medicine Temple University	Mitochondrial Calcium Signaling in Alzheimer's Disease
January 21	Hsin-Kai Liao, Ph.D. Salk Institute for Biological Studies	Stem Cell and Genome Targeting in Aging and Molecular Medicine

March 11	Donard Dwyer, Ph.D. Professor, Psychiatry/Pharmacology LSUHS	Genomic Chaos Begets Psychiatric Disorder
March 18	Imtiaz Khalil, Graduate Assistant, Biochemistry & Molecular Biology, LSUHS	TLK1 Phosphorylation of MK5 Promotes Prostate Cancer Cell Motility and Invasion
March 25	Monica Cartelle Gestal, Ph.D. Assistant Professor, Microbiology & Immunology, LSUHS	Bacteria Manipulation of Innate Immunity
April 1	Qian-Ben Wang, Ph.D. Professor, Pathology Duke University	Epigenetic Regulation in Hormone-Department Cancers
April 8	Eric First, Ph.D. Associate Professor, Biochemistry & Molecular Biology, LSUHS	Aminoacyl-tRNA Synthetases – New Tricks from Old Enzymes
April 15	Youngho Kwon, Ph.D. Associate Professor, Biochemistry & Structural Biology, LSUHS	Molecular Functions of BRCA2 in Genome Maintenance and Repair
April 22	Yufeng Dong, Ph.D. Associate Professor, Orthopedics, LSUHS	Targeting Notch Signaling and Stem Cells for Bone Tissue Regeneration
April 29	Chang-Deng Hu, Ph.D. Professor, Medicinal Chemistry and Molecular Pharmacology Purdue University	Neuroendocrine Differentiation in Prostate Cancer: A Mechanism of Therapy Resistance and Tumor Recurrence
May 6	Ishita Ghosh, Graduate Assistant, Biochemistry & Molecular Biology LSUHS	Revealing the Function of Tousled like Kinases in DSB Repair
May 13	Quiyang Zhang, Ph.D. Structural & Cellular Biology Tulane University	Aging and Prostate Cancer: Mechanisms of How Inflamm-aging Promotes Prostate Carcinogenesis
May 27	Stephan N. Witt, Ph.D. Professor and Chairman, Biochemistry & Molecular Biology, LSUHS	Viral peptide triggers rapid aggregation and fibrillization of alpha-synuclein
June 3	Vickky Pandit, Graduate Assistant, Biochemistry & Molecular Biology, LSUHS	Investigation of the Role of Mediator and Chromatin Remodeling Complexes in *HSP* Gene Coalescence

Postdoctoral Fellows

NAME	SCHOOL	MENTOR	TITLE OF PROJECT
Zhu Huang	LSUHS	Shile Huang	Dihydroartemisinin inhibition of mTORC1
Rajyalakshmi Meduri	LSUHS	David S. Gross	Heat Shock Factor-directed mRNA export & expression; role of phase separation in *HSP* gene transcription in *Saccharomyces cerevisiae*
Reynaldo Moreno	LSUHS	Eric First	Developing novel cancer therapeutics that target post-transfer editing in aminoacy1-tRNA synthetases
Rajesh Parsanathan	LSUHS	Sushil K. Jain	G6PD-deficiency & CVD in African American
Santhanasabapathy Rajasekaran	LSUHS	Stephan N. Witt	Role of alpha-synuclein in melanoma
Vibha Singh	LSUHS	Arrigo De Benedetti	Targeting the TLK1-NEK1 axis in PCa
Vingli Shi	LSUHS	Xiuping Yu	Wnt/beta-Catenin signaling in PCa progression

Medical Students

NAME	SCHOOL	MENTOR	TITLE OF PROJECT
William McLean	LSUHSC	Sushil K. Jain	Effect of vitamin C on Bone Mineral Density in type 2 diabetic patients

Undergraduate Student

NAME	SCHOOL	MENTOR	TITLE OF PROJECT
Emma Grace Lemoine	Centenary	Shile Huang	PP5 regulation of cell motility
Elizabeth Matthew	Centenary	Sushil K. Jain	Vitamin D-deficiency in African Americans
Christopher M. Stevens	Centenary	Sushil K. Jain	Obesity and Inflammation

Service

Service at the National and International Level

Arrigo De Benedetti

Reviewer for :

- *Pharmacology & Therapeutics*
- *Molecules*

Associate Editor for :

- *BMC Research notes*

Eric A. First

Reviewer for :

- *Nucleic Acids Research*
- *Frontiers in Cardiovascular Medicine*

David S. Gross

Ad hoc Reviewer for :

- *eLife*
- *Molecular Biology of the Cell*
- *Nature Communications Biology*
- *Genome Research*
- *Molecular Cellular Biology*
- *FEBS Letters*
- *Epigenetics & Chromation*

Ad hoc Panel Member :

- *NIH Molecular Genetics B (MGB) Study Section*

Shile Huang

Ad hoc Grant Reviewer for :

- *International Foundation for Science (IFS), Sweden*

Guest Editor for :

- *The Special Issue "mTOR Signaling in Metabolism and Cancer" for the journal "cells"*

Editorial Board Member for :

- *American Journal of Cancer Biology*
- *American Journal of Cancer Therapy and Pharmacology*
- *Anti-Cancer Agents in Medicinal Chemistry CellBio*
- *Cells (Cell Signaling Section)*
- *Exploration of Neuroprotective Therapy*
- *Frontiers in Oncology-Surgical Oncology*
- *International Journal of Biochemistry & Molecular Biology*
- *International Journal of Biochemistry & Pharmacology*
- *International Journal of Stem Cells & Regenerative Medicine*
- *Journal of Nutritional Therapeutics*
- *Journal of Research Notes*
- *LOJ Pharmacology & Clinical Research*
- *Reactive Oxygen Species*
- *Sci*
- *Signal Transduction and Targeted Therapy*
- *Universal Journal of Oncology*

Journal Reviewer for :

- *Aging (2)*
- *Alzheimer's and Dementia*
- *Anti-Cancer Agents in Medicinal Chemistry (2)*
- *Apoptosis*
- *BBA-Molecular Cell Research (3)*
- *BMC Cancer*
- *Drug Discovery Today*
- *Environment International*
- *Environment Pollution (2)*
- *Journal of Controlled Release (2)*
- *Journal of Ethnopharmacology*
- *Journal for ImmunoTherapy of Cancer*
- *Neurochemistry International*
- *Oncogene*
- *Progress in Neurobiology (2)*
- *Scientific Reports*
- *Toxicology (2)*

Sushil K. Jain

Reviewer for :

- *NIDDK Special Emphasis Panel/Scientific Review Group, 2021*
- *NIMHD Healthy Disparity L/60 Healthy Disparity LRP LRO, 2021*
- *NIMHD Healthy Disparity L/32 Clinical Research LRP, 2021*

Review Panel Member for :

- *National Science Center of Poland, 2021*

Grant Reviewer for :

- *University grant commission, Research Grants Council, Hong Kong, 2021*

Associate Editor for :

- *Journal of American College of Nutrition*

Active Reviewer & Editorial Board for :

- *Diabetes*
- *Diabetes Care*
- *Free Radical Biol & Medicine*
- *Metabolic Syndrome & Related Disorders*
- *J Amer College of Nutrition*

Editorial Board Member :

- *Antioxidants & Redox Signaling*
- *Mol Cell Biochem*
- *Nutrition & Dietary Supplements*
- *Experimental Diabetes*

Manuscript Reviewer for :

- *National Annual Scientific Meeting*
- *Abstract Reviewer*
- *Society of Free Radical Biology & Medicine*

Award Selection Committee Member :

- *"Ragus Award", 2020 Annual Meeting of American College of Nutrition*

Nancy Leidenheimer

Ad hoc Reviewer for :

- *FEBS open*
- *International Journal of Molecular Sciences*
- *Molecules*

Lucy C. Robinson

Proposal Reviewer for :

- *National Science Foundation*

Gulshan Sunavala-Dossabhoy

Reviewer & Deputy Editor :

- *Oral Diseases*

Reviewer & Senior Editor :

- *AIMS in Medical Science*

Stephan N. Witt

Editorial Board Member :

- *Cell Stress & Chaperones*
- *Journal of Biological Chemistry*

Academic Editor:

- *PLOS One*

Review Editor:

- *Frontiers in Aging, Metabolism and Redox Biology*

Reviewer for:

- *PLOS BIOLOGY*
- *International Journal of Molecular Sciences*
- *Redox Biology*

NIH Study Section service:

- *Fellowships: Biophysical, Physiological, Pharmacologicaland Bioengineering Neuroscience, ZRG1 F03B-R (20) L. Oct 22-23, 2020 and Feb 25-26, 2021*
- *NIH Cellular and Molecular Biology of Neurodegeneration (CMND) Study Section. June 24-25, 2021*

Xiuping Yu

Reviewer for :

- *DOD Grant, 2020*

LSU Committees and Service

Arrigo De Benedetti
Member, Biosafety Committee

Eric A. First
Member, Medical Student Admissions Committee
Member, Research Advisory Committee
Member, Radiation Safety Committee
Member, LSUHSC-S Technology Transfer Scientific Review Committee
Member, LSUHSC-S Faculty Senate

David S. Gross
Leader, Epigenetics Focus Group of FWCC

Shile Huang
Leader, Developmental Therapeutics-Natural Products Group, FWCC, LSUHSC-S
Intramural Predoctoral Committee, LSUHSC-S

Sushil K. Jain
Member, Conflict of Interest Committee
Member, Promotion and Tenture Committee

Nancy Leidenheimer
Member, Promotions & Tenure Committee
Member, SOM Admissions Committee
Member, Institutional Wellness Committee
Member, Medical Sciences MS program planning Committee
Floor Manger, BRI 7th floor

Brent C. Reed
Member, Biosafety Committee
Member, Graduate Advisory Council

Lucy C. Robinson
Panelist, Faculty Development Workshop-Building Teaching Skills
Member, Cardiovascular T32 Executive Committee
Chair, Student Affairs Committee
Member, LCME Standard 7 Team
Member, LCME Standard 9 Team
Volunteer, EVT Lab data entry Volunteer coordinator & trainer
Member, IGP Admissions Committee
Member, Professionalism Committee
Member, Intramural pre-doctoral fellowship review panel
Poster Judge, Graduate Research Day
Director, CELLULAR research program for Centenary College students to train in research at LSUHSC-S

Gulshan Sunavala-Dossabhoy
Member, Animal Care and Use Committee
Member, Risk Assessment Subcommittee

Kelly G. Tatchell
Director, Research Core Facility
Director, MD/PhD Committee

Stephan N. Witt
Ambassador, American Society of Cell Biology for LSUHSC-S
Member, Graduate Advisory Council
Member, Graduate Research Council
Member, Administrative Council

Xiuping Yu
Member, Biosafety Committee
Member, Library Committee
Member, Graduate Advisory Council
Member, Graduate recruitment committee

Department of Biochemistry and Molecular Biology
Committees and Service

Arrigo De Benedetti
Director of Seminar series
Faculty Search Committee

Eric A. First
Departmental Vice Head

David S. Gross
Graduate Admissions Committee
Faculty Search Committee

Shile Huang
Member, Graduate Admissions Committee
Coordinator, Departmental Journal Club

Brent C. Reed
Member, Graduate Program Review Committee
Director, Graduate Studies

Lucy C. Robinson
Member, Graduate Admissions Committee

Sergey Slepenkov
Evaluator, Departmental Journal Club

Gulshan Sunavala-Dossabhoy
Coordinator, Cell Culture Facility

Xiuping Yu
Chair, Graduate Admissions Committee

Professional Service to the State, Parish and Local Community

Eric A. First
Member, Northwest Louisiana Chapter of the American Chemical Society

Shile Huang
Evaluation for faculty promotion and tenure (LSU-S)

Poster Judge from Postdoctoral Fellows, Graduate Research Day, LSUHSC-S

Lucy C. Robinson
Judge, Fairfield Elementary Science Fair

Poster Judge, Louisiana Juniro Science and Humanities Symposium, LSUHS

Gulshan Sunavala
Judge, Louisiana Region I Science & Engineering Fair

'COVID-19: How research makes a difference', Shreveport Memorial Library