Upstate Medical University is pleased to offer its free visiting lectures series to bring undergraduates a lively and informative lecture with one of our leading faculty members. The professors in our series are well-funded investigators performing ground-breaking research in their fields. Lectures conclude with a brief presentation on the biomedical graduate degree programs and student research offerings available at SUNY Upstate.

UPSTATE MEDICAL UNIVERSITY
COLLEGE OF GRADUATE STUDIES
State University of New York

UPSTATE VISITING LECTURERS

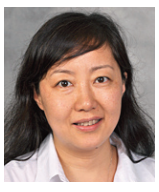
Jeffrey Amack, PhD, Cell & Developmental Biology
Mechanobiology in the Zebrafish Embryo
Mechanobiology describes how physical forces influence cell behaviors. We use the zebrafish embryo to investigate mechanical properties that drive formation of tissues and organs.

David Auerbach, PhD, Pharmacology
Bench-to-Bedside Approaches to Studying Neuro-Cardiac Electrical Abnormalities
The long-term goal of the laboratory is to investigate the prevalence, risk factors, and mechanisms for dual electrical disturbances of the brain (seizures) and heart (arrhythmias). We are particularly interested in improving our understanding of the multi-system cascade of events that lead to Sudden Unexpected Death in Epilepsy Patients (SUDEP). We take a multi-system (brain & heart) and multi-scale (molecular, biochemical, cellular, organ, in vivo, and clinical) approach to investigating arrhythmias, seizures, and SUDEP.

Darwin Babino, PhD, Neuroscience
Harnessing AI to Decode Retinal Signals.
Our lab applies machine learning and AI to decode neural signals from the retina, guiding the development of therapies like photoswitches to restore vision. By analyzing data from multi-electrode arrays, we uncover patterns in retinal function that help address vision deficits caused by degeneration.

Alaji Bah, PhD, Biochemistry & Molecular Biology
Regulation of Binding, Folding and Phase Separation of Intrinsically Disordered Proteins by Post Translational Modifications
Intrinsically disordered proteins are a class of proteins that do not fold into a stable conformation under physiological conditions, yet they play critical biological roles. In this introduction, I will discuss how the functions of these proteins are regulated by post-translational modifications.

Karen Boschen, PhD, Neuroscience
Environmental and Genetic Influences on Neurodevelopment
Alcohol, drugs, and stress can cause significant physical and functional damage to the developing brain. Our laboratory studies how genetics can increase risk or act as a protective factor in the context of prenatal drug exposure. In my presentation I will discuss how preclinical models are used to understand internal and external influences on brain development and probe specific cell signaling pathways.

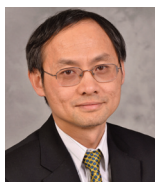


Wenyi Feng, PhD, Biochemistry & Molecular Biology
Chromosome Fragility: When Replication Goes Awry
We are interested in the mechanisms of how DNA replication defects, either due to genetic mutations or to external environmental stress, cause chromosome breakage and genome instability. Such mechanisms bear importance on our understanding of human disease conditions ranging from cancer to neurodevelopmental disorders.

Stephen J. Glatt, PhD, Psychiatry & Behavioral Sciences
Biomarkers for Neuropsychiatric Disorders
Unlike many other medical conditions, neuropsychiatric disorders are currently diagnosed based only on behavioral reports and clinical observation rather than biomarkers. The presentation will summarize the latest efforts to identify valid biomarkers for these disorders, which should facilitate earlier identification and intervention and better outcomes.

Jonathan Hess, PhD, Neuroscience
Advances in Genetics Resilience to Neuropsychiatric Disorders
Resilience – the ability to adapt to significant adversity – recently emerged as a focal point in human genomics research. Understanding how genes influence resilience is crucial for advancing disease detection and improving drug development. This talk summaries our lab's recent work, including new methods that we developed to identify genes that foster resilience to neuropsychiatric disorders such as schizophrenia and Alzheimer's disease.

Patricia Kane, PhD, Biochemistry & Molecular Biology
Control of Cellular pH in Life, Death and Aging
The Kane lab investigates the regulation of cellular pH and specifically, the regulation and function of the highly conserved V-ATPase proton pump, in yeast and tissue culture cells using biochemistry, genetics, and molecular and cell biology. Loss of function or regulation of V-ATPases is associated with diseases ranging from neurodegeneration to cancer, and our recent data indicates that V-ATPase function is reduced at early stages of aging. We are interested in understanding V-ATPase regulation in order to tune V-ATPase activity under different conditions.



Chunyu Liu, PhD, Psychiatry & Behavioral Sciences
Genome, Epigenome, Proteome and Phenome of Psychiatric Disorders
Using big data of genetics, genomics, epigenomics, and phenotypes to reveal biological mechanism of mental illness as well as normal behavioral traits.

Stewart Loh, PhD, Biochemistry & Molecular Biology
Design of Biomolecular Switches
The Loh lab applies biophysical, biochemical, structural, and cell-based approaches to carry out two research programs. The first program is to develop protein engineering strategies by which ordinary proteins can be converted to molecular switches. These technologies describe how to combine one protein (the input domain) with a second protein (the output domain) such that binding of a target ligand to the input domain causes the output domain to change its conformation and thus its biological activity. Our designs emphasize modularity—the ability to mix and match input and output domains for specific functionalities—and we have introduced multiple mechanisms for doing so (mutually exclusive folding, induced domain swapping, protein fragment exchange, and alternate frame folding). These switches are used as biosensors and for functional regulation in the cell.

David W. Pruyne, PhD, Cell & Developmental Biology
Building the Cell's Internal Skeleton - How Does it Happen, and Why Does it Matter?
The actin cytoskeleton is a network of protein filaments inside the cell that control the shape and movement of cells. We are studying how cytoskeleton assembly is controlled using a combination of biochemical studies of pure proteins, microscopic analysis of cells, and study of muscle development in vertebrate and invertebrate animals with mutations in key actin regulatory proteins.

Mark E. Schmitt, PhD, Biochemistry & Molecular Biology
All Ribosomes are Not Created Equal
Ribosomes are extremely ancient RNA-based enzymes that catalyze protein synthesis in all organisms. Ribosomes differ in their RNA and protein composition and these subtle differences confer different functions that control and regulate the translation process.

Vladimir Sirotkin, PhD, Cell & Developmental Biology
Endocytosis by the Numbers: Investigation of the Mechanisms of Endocytosis by Quantitative Live Cell Imaging
The actin cytoskeleton dynamics are responsible for changes in cell shape. By counting the numbers of molecules in live cells, we investigate how cells control the actin filament assembly driving membrane deformation during endocytosis.

Levi Todd, PhD, Neuroscience
Regenerating lost neurons.
In humans, loss of neurons results in permanent disability because the mammalian nervous system lacks a regenerative capacity. In contrast, species like fish and amphibians can regenerate lost neurons. Our work focuses on using lessons from regenerative species to stimulate regeneration of lost neurons in the mammalian retina.

Daniel Tso, PhD, Neurosurgery
It's a Colorful World
Color fills our visual world and is one of its most striking features. The technology to capture and display color, cameras, TV screens and film, is similarly pervasive and seemingly straightforward. Yet the neural and perceptual sciences of color are highly complex and not fully understood. We will delve into the neuroscience of human color vision to try to make sense of that for which we take for granted.

Mariano Viapiano, PhD , Neuroscience and Physiology
Brain Cancer: Finding New Targets Outside the Tumor Cells
Gliomas are malignant cancers that originate in the brain and have very poor prognoses. Our laboratory studies how glioma cells interact with normal cells in the brain and change the neural environment to their advantage. In my lecture I will describe mechanisms of glioma growth and invasion identified in our laboratory and will discuss novel therapeutic strategies against malignant brain tumors.

Cynthia S. Weickert, PhD, Neuroscience
On the Road to Curing Schizophrenia
In this talk, we'll explore the groundbreaking research connecting brain autoantibodies to N-Methyl-D-Aspartate Receptor (NMDAR) with the development of schizophrenia. We'll delve into how these autoantibodies disrupt normal neurotransmission, leading to symptoms that closely mirror those of schizophrenia. Through a review of recent studies on brain biology and clinical findings, we'll highlight how this autoimmune mechanism can reshape our understanding of the disease, its diagnosis, and potential new treatment approaches. Join us to uncover the intersection of autoimmune science and psychiatric disorders, and how it could revolutionize our approach to schizophrenia.

To request a speaker from our lecture series, visit upstate.edu/grad, and select the "Visiting Lecture Series" link, or email: biosci@upstate.edu.