

Summer Fellowship Placement Sites 2025

Mike Barish, Ph.D.

**Department of Neuroscience
Beckman Research Institute
City of Hope
Duarte, CA**

Dr. Barish is investigating early electrical activity in the developing hippocampus and cortex and its relationship to neural birth, migration and maturation. In collaboration with Karen Aboody, M.D. , (Hematology/HCT) and Carlotta Glackin, Ph.D. , is also examining the molecular mechanisms of neural progenitor cell migration to glioma and tumors outside the brain, and targeting of these tumors with genetically-modified therapeutics using immortalized neural progenitor cells. For more detailed information on Dr. Barish's research please go to www.cityofhope.org/neurosciences or you may contact Dr. Barish at mbarish@coh.org.

Michel Baudry, Ph.D.

**Graduate College of Biomedical Sciences
Western University of Health Sciences
Pomona CA**

Research Interests:

1. Mechanisms implicated in long-term synaptic potentiation and depression in hippocampus and other brain regions.
2. Regulation of glutamate receptors.
3. Role of oxygen free radicals in central nervous system.
4. Mechanisms underlying selective neuronal degeneration.
5. Computational neuroscience

For more information please visit www.westernu.edu. You may contact Professor Baudry at mbaudry@westernu.edu

Xiaoning Bi M.D., Ph.D.

**Basic Medical Sciences
College of Osteopathic Medicine of the Pacific
Western University of Health Sciences**

Research in my laboratory seeks to understand how neurons develop, mature, and function properly and how they die when challenged by natural aging process, by intrinsic genetic defects, or by various insults. We hope that by understanding the basic

molecular cellular mechanisms that govern these processes we can develop better preventive and therapeutic strategies for central nervous system disorders in children as well as in elders.

For more information please visit www.westernu.edu. You may contact Professor Bi at xbi@westernu.edu.

Samantha Butler Ph.D.

**Department of Neurobiology & The Edythe and Eli Broad Center of Regenerative Medicine and Stem Cell Research
David Geffen School of Medicine
University of California, Los Angeles
Los Angeles, CA**

The extraordinarily diverse functions of the nervous system, from cognition to movement, are possible because neurons are assembled into precisely ordered networks that permit them to rapidly and accurately communicate with their synaptic targets. My laboratory seeks to understand the mechanisms that establish these neuronal networks during development with the long-term goal of determining how this process may be co-opted to regenerate diseased or damaged circuits. Working the developing spinal cord, we have shown that molecules previously identified as morphogens, such as the Bone Morphogenetic Proteins (BMPs) family of growth factors, can also act as axon guidance signals. We are now determining the key intrinsic factors that translate the ability of the BMPs to direct cell fate and axon guidance decisions, two strikingly different processes in the generation of neural circuits. During the course of these studies, we have identified a critical mechanism by which the rate of axon outgrowth is controlled during embryogenesis, thereby permitting neural circuits to develop in synchrony with the rest of the embryo. My laboratory is currently assessing how this mechanism can be harnessed to accelerate axon growth in a regenerative context to stimulate the repair of neural circuits. The successful implementation of this technology could result in significantly improved recovery times for patients with damaged nervous systems. For more information please visit www.faculty.neuroscience.ucla.edu or contact Dr. Butler at butlersj@ucla.edu

Giorgio Coricelli, Ph.D.

**Department of Economics (Neuroeconomics)
University of Southern California
3620 S. Vermont Ave.
Los Angeles, CA 90089-0253**

Neuroeconomics, experimental economics, game theory

We study human behaviors emerging from the interplay of cognitive and emotional systems. Our research agenda includes two main projects. The first one concerns the role of emotions in decision making, and the second is aimed at investigating the relational complexity in social interaction. Our objective is to apply robust methods and findings

from behavioral decision theory to study the brain structures that contribute to forming judgments and decisions, both in an individual and a social context.

We study (1) the role of counterfactual emotions, such as regret and envy, in decision making (fMRI, Orbitofrontal patients, and developmental studies); (2) the neural basis of bounded rational behavior: limit in depth of strategic reasoning (fMRI and eye-tracking studies on attention in games); (3) the neural correlates of individual and social uncertainty: disposition effect, aspiration level, strategic uncertainty; (4) how the brain encodes learning signals: regret/fictive learning, reputation building, transfer learning; (5) impaired decision making in schizophrenia and autism; (6) eating disorders.

We conduct our research using a fundamentally multidisciplinary approach (Neuroeconomics), drawing from behavioral and experimental economics, game theory, neuroimaging (fMRI), neuropsychology (patients studies), and cognitive neurosciences.

Jun-Hyeong Cho, Ph.D.

**Department of Cell, Systems and Molecular Biology
University of California, Riverside
Riverside, CA**

In order to survive in a dynamic environment, animals develop fear responses to dangerous situations. The neural mechanism of learned fear has great survival value for animals, who must predict biologically relevant events from seemingly neutral cues. In order to develop adaptive fear responses, the brain must discriminate between different sensory cues or contexts and associates only relevant stimuli with aversive events. Dysregulation of this process leads to maladaptive overgeneralized fear in PTSD. Our long-term research goal is to discover the neural mechanisms of adaptive fear and anxiety, so that improved strategies can be developed to suppress maladaptive fear.

In classical fear conditioning—an experimental model of fear learning—experimental subjects learn to associate an emotionally-neutral conditioned stimulus (CS, sensory cue or context) with an aversive unconditioned stimulus (US). A specific CS activates only a subset of neurons in the sensory cortex/thalamus and hippocampus, which convey CS information to the amygdala, integrating the information of the CS and US for fear memory formation. Our central hypothesis is that specific fear memory is encoded by selective long-term potentiation (LTP) in pathways conveying specific CS information to the amygdala. If such input-specific LTP underlies fear memory specificity, fear memory for the CS could be erased selectively by depotentiation, reversing the input-specific LTP. We are testing the hypothesis, using a combination of neural activity-dependent behavioral labeling, electrophysiological and optogenetic approaches in mouse models of fear conditioning. Our studies will elucidate fundamental principles of adaptive fear to the relevant stimulus and provide new insights into developing strategies to attenuate pathological fear memory without affecting adaptive fear memories in PTSD.

<https://profiles.ucr.edu/app/home/profile/juncho>; Email: juncho@ucr.edu

Christine Fowler, Ph.D.

**Department of Neurobiology and Behavior
University of California, Irvine
Irvine, CA**

Our group's overall research goals are centered on elucidating the neurobiological mechanisms underlying motivated behaviors and behavioral deficits associated with neuropsychiatric disorders, such as depression. At present, we are focused on determining how drugs of abuse modulate brain circuitries involved in the emergence and maintenance of drug seeking behaviors that characterize addiction. While the vast majority of research in the field has focused on the mesocorticolimbic dopamine 'reward' pathway, much less is known about the involvement of other motivation-related circuits in addiction. Further, given the high comorbidity between depression and substance abuse, it has been proposed that similar mechanisms may mediate both disease states, and/or individuals with depression may consume drugs of abuse to modulate symptoms associated with the disorder.

Recently, we established a key role for the medial habenula (MHb) and its major afferent target, the interpeduncular nucleus (IPN), in controlling the addictive properties of nicotine. Specifically, we found that nicotinic acetylcholine receptors (nAChRs) in the MHb-IPN, particularly those containing $\alpha 5$ subunits, control the aversive effects of nicotine and thereby limit consumption of the drug. This finding likely explains why human allelic variation in the gene encoding the $\alpha 5$ subunit gene (CHRNA5) dramatically increases vulnerability to tobacco dependence and smoking related diseases in humans, such as lung cancer. Moreover, these data have promoted the pharmaceutical development of novel small molecule $\alpha 5$ nAChR ligands that will potentially be used as smoking cessation agents.

For more information please contact cdfowler@uci.edu or visit her website at <http://faculty.sites.uci.edu/fowlerlab/research/>

Timothy Gentner, Ph.D.

**Department of Psychology
University of California, San Diego
La Jolla, CA**

Our research takes an integrative, systems-level approach to study the neural mechanisms that govern the sensory, perceptual, and cognitive processing of real-world acoustic signals. We want to know how the brain represents behaviorally important, complex, natural stimuli; what spatial and temporal forms these functional representations assume; how they are learned and remembered; how perceptual representations function in higher-level decision processes; and how the outputs of such processes guide natural behaviors. Our primary focus is on the elaborate vocal communication system in

songbirds. For more information please contact Dr. Gentner at tgentner@ucsd.edu or visit the lab website at <http://gentnerlab.ucsd.edu>.

David Glanzman, Ph.D.

**Department of Integrative Biology and Physiology
University of California, Los Angeles
Los Angeles, CA**

My laboratory is interested in the cell biology of learning and memory in simple organisms. The marine invertebrate *Aplysia californica* has a comparatively simple nervous system (~ 20,000 neurons) that provides a valuable experimental model for understanding the cellular mechanisms that underlie simple forms of learning, such as habituation, sensitization, and classical conditioning. Another experimental advantage of *Aplysia* is that sensory and motor neurons that mediate specific reflexes of the animal can be placed into dissociated cell culture where they will reform their synaptic connections. These *in vitro* sensorimotor synapses are extremely useful for cellular and molecular studies of short- and long-term learning-related synaptic plasticity. Currently, my laboratory is investigating the modulation of AMPA-type glutamate receptors during learning in *Aplysia*. We have found that serotonin, an endogenous monoamine that plays a central role in learning, modulates the efficacy of AMPA receptors in the motor neurons. Our current evidence indicates that serotonin modulates the trafficking of AMPA receptors in the motor neurons, causing additional receptors to be delivered to postsynaptic sites via exocytosis. We also wish to know whether long-term learning in *Aplysia* involves changes in the expression of glutamate receptors. We have cloned and sequenced ten AMPA-type and one NMDA-type glutamate receptor from the CNS of *Aplysia*. Currently, we are using the techniques of *in situ* hybridization and quantitative RT-PCR to examine whether long-term sensitization and long-term habituation are accompanied by changes in glutamate receptor expression. For more information please visit www.ibp.ucla.edu or contact Professor Glanzman at dglanzman@physci.ucla.edu.

Alicia Izquierdo-Edler, Ph.D.

**Department of Psychology
University of California, Los Angeles
Los Angeles, CA**

Research Interests

My main interests include: Uncovering the neural mechanisms important for flexible cognition and behavior, exploring the factors contributing to reward-related decision-making, and studying the neuropharmacology of [and effects of psychostimulants on] executive function. At best, addressing these research questions could contribute to a better understanding (and treatment) of diseases such as OCD, PTSD, addiction/relapse, and Impulse Control Disorder.

Contact: aizquie@calstatela.edu

Regina Lapate, Ph.D.

**Department of Physiological and Brain Sciences
University of California, Santa Barbara
Santa Barbara, CA**

My laboratory investigates fundamental mechanisms that give rise to subjective (conscious) emotional experiences, determine the influence of emotional signals, and promote adaptive responding to emotional events. Our research examines questions such as:

1. What is the function of conscious awareness—including metacognitive awareness?
2. What neural mechanisms promote effective emotion regulation?
3. How do representations in distinct prefrontal regions modulate emotional behavior?

To answer these questions, we use a multimodal approach that emphasizes causal inference, and includes transcranial magnetic stimulation, recordings of peripheral physiology, electroencephalography, and functional neuroimaging—often combined with behavioral assays and analyses anchored in individual differences. The long term goal of our research program is to uncover basic mechanisms underlying function and dysfunction in emotion generation and regulation that promote resilience and are at the core of mood, anxiety, and addiction disorders—therefore ultimately informing their optimal intervention.

Contact: regina.lapate@psych.ucsb.edu

Albert Laspada, M.D., Ph.D.

**Department of Neurobiology and Behavior
UCI School of Medicine
Irvine CA**

My research is focused upon neurodegenerative disease, as my lab is seeking the molecular events that underlie neurodegeneration and neuron cell death in spinocerebellar ataxia type 7, spinal & bulbar muscular atrophy, Huntington's Disease, ALS, Parkinson's disease, and Alzheimer's disease. My team has uncovered evidence for transcription dysregulation, perturbed bioenergetics, and altered protein quality control as contributing factors to neuron dysfunction. By reproducing molecular pathology in mice and in neurons, astrocytes, microglia, and skeletal muscle cells derived from human patient stem cells, we have begun to develop therapies to treat these disorders.

Contact: alaspada@uci.edu
Website: <https://neurobiology.uci.edu/research/>

Stephen Mahler, Ph.D.

**Department of Neurobiology and Behavior
University of California, Irvine
Irvine, CA**

Brain circuits of “reward” are evolutionarily ancient, and likely function in a qualitatively similar way in humans and model organisms such as rodents. Such homology should not be surprising considering the strong adaptive pressure on organisms to efficiently exploit environmental opportunities when they are available. In order to attain a natural reward like food, water, or sex, animals must know what and where rewards are, and how to get them. This is accomplished in part via the brain’s “reward circuitry,” aspects of which allow animals to recognize rewards when they are attained, learn about the circumstances in which they were attained, remember these circumstances when they are encountered in future, and generate appropriate motivated behavior at those times. We investigate the neural circuits underlying these psychological processes, including learning, motivation, and pleasure. We employ anatomical, pharmacological, and virus-based strategies to examine and control neuronal populations and circuits in rodents, with the aim of understanding how these circuits control behavior.

Email: mahlers@uci.edu

**Kabir Lutfy
College of Pharmacy
Western University Health Sciences
Pomona CA 91711**

Our laboratory is interested in the role of neuropeptides, particularly opioid peptides, in the rewarding and addictive effects of psychostimulants, opioids, nicotine, and alcohol. We are also interested in the role of these peptides in food reward, binge eating, obesity, and type 2 diabetes. We use behavioral approaches to measure drug/food reward, reinforcement, anxiety, depression, and locomotor sensitization following acute and chronic administrations of drugs/palatable food. We also use molecular and neurochemical approaches, such as microdialysis, western blot, rt-PCR, etc., to assess changes in the level of dopamine, glutamate, stress hormones, and opioid peptides in different brain areas, as well as in plasma glucose and insulin levels and activity of the enzymes involved in glucose homeostasis in response to repeated administration of addictive drugs and palatable food.

Email: klutfy@westernu.edu

Andy Obenaus, Ph.D.

**Department of Pediatrics
Preclinical and Translational Imaging Center
University of California, Irvine School of Medicine
Irvine, CA**

Dr. Obenaus serves as the Director of the Non-Invasive Imaging Laboratory in the Radiation Biology Program at Loma Linda University. His laboratory is well known for its state-of-the-art equipment. His expertise is in the area of neuroimaging of disease, and the Noninvasive Imaging Laboratory has experience with a broad range of topics and models of disease including Alzheimer's and neuro-repair using stem cells. He has been involved in teaching Biomedical Imaging and Radiation Biology, and he has supervised a number of undergraduate and graduate students.

For more information: http://www.faculty.uci.edu/profile.cfm?faculty_id=6327 or you may contact Dr. Obenaus at obenausa@uci.edu

Kathleen Page M.D.

**Keck School of Medicine
Division of Endocrinology
University of Southern California**

We aim to understand the causes of obesity and diabetes so that more effective strategies can be developed for reducing the number of people affected by these health conditions. Diabetes and obesity are critical health topics to study as in the United States, more than 35% of adults and 17% of children are obese. Additionally, 25.8 million children and adults have diabetes — this is a staggering 8.3% of the population.

Our work combines a number of fields (including neuroscience, physiology, nutrition and psychology) and applies novel techniques to tackle the roots of obesity and diabetes.

For more information please contact Dr. Kathleen Page at drkatieapage@gmail.com or visit her website at <https://www.drkatiepage.com>

Robert Pechnick, PhD

**Neuropharmacology
College of Osteopathic Medicine of the Pacific
Western University Health Sciences**

The research in my laboratory is focused on three aspects of neuropsychopharmacology: using animals models to understand the causes of and to develop new potential treatments for various forms of mental illness; utilizing both in vivo and in vitro approaches to study the neuropharmacology of drugs of abuse; and defining the role of hippocampal neurogenesis in health and disease states. Primary goals include: characterizing the role of developmental insults (prenatal, neonatal and adolescent) in producing neuropsychiatric disorders; defining the involvement of cytokines and stress in neurogenesis and depression; understanding the role of neurogenesis in post-chemotherapy-induced cognitive function, and determining the neurochemical mechanisms underlying the effects of nicotine, cocaine and phencyclidine (PCP), and the pathophysiological and neurochemical consequences of the repeated administration of these drugs. Experimental approaches involve studying the effects of the systemic and central administration of selective agonists, antagonists and antisense oligonucleotides, using transgenic animal models, utilizing viral-mediated gene delivery, and characterizing functional responses as well as changes in receptor subunit gene expression, neurotransmitter levels and neurotransmitter receptors after acute and chronic drug administration.

For more information: www.westernu.edu. You may contact Professor Penchnick atrpchnick@westernu.edu

Jesse Rissman, Ph.D.

**Department of Psychology
University of California, Los Angeles
Los Angeles, UCLA**

My research investigates the influence of goal-directed attention on memory at both short and long timescales. I am interested in how top-down attentional control processes govern which mental representations are maintained in an active state on a moment-to-moment basis while ensuring that distracting stimuli are appropriately ignored. And I am also interested in how an individual's goals and associated attentional states serve to guide the formation of a more durable mnemonic record of select experiences or facilitate the retrieval of relevant episodic details from one's past. To characterize the neural systems subserving human memory, I have developed and applied novel fMRI analysis techniques that exploit the richness of the data. Rather than simply using fMRI to isolate the functional contributions of individual brain regions, my work has also sought to elucidate the role of dynamic interactions between brain regions, as well as to decode the informational content of distributed brain activity patterns.

Lab website: rissmanlab.psych.ucla.edu

Email: rissman@psych.ucla.edu

Ephron Rosenzweig, Ph.D.

**Assistant Project Scientist
Center of Neural Repair**

**Department of Neurosciences
University of California, San Diego**

My research addresses two different approaches to spinal cord repair: regeneration of cut axons and sprouting of intact axons. Although regeneration of cut axons is the ultimate goal of spinal cord repair research, data from our lab and others suggests that a more practical approach may be to stimulate the compensatory sprouting of axons spared by the initial injury. These axons could form new circuitry beyond the lesion, potentially restoring function. Because even severe human spinal cord injuries (SCIs) generally leave some axons intact, many people currently living with SCI could benefit from such a treatment.

For more information please contact Dr. Rosenzweig at ephronr@gmail.com. You may also contact the the Director of the Center for Neural Repair at UCSD Dr. Mark Tuszynski at mtuszyns@ucsd.edu.

Amelia Russo-Neustadt M.D., Ph.D.

**Biological Sciences Department
California State University, Los Angeles
5151 State University Drive, Los Angeles**

Effects of physical activity and antidepressants on induction of BDNF in the brain.

My current research focus involves the study of physical activity and antidepressant treatment interactions in the brain. Our studies seek to reveal the mechanisms of growth factor regulation and behavioral/functional recovery resulting from these interactions.

For more information go to www.calstatela.edu. You may contact Professor Russo-Neustadt at arusson@calstatela.edu.

Amanda Saratsis, M.D.

**Indiana University/Riley's Children Hospital
Bloomington IN**

Diffuse Intrinsic Pontine Glioma (DIPG) is a World Health Organization Grade IV, inoperable, universally lethal pediatric brainstem tumor characterized by invasive growth of midline structures, unresponsiveness to traditional glioblastoma multiforme chemotherapeutics, and acquired resistance to radiation. The aggressivity of DIPG results from its large and pervasive cell type of origin, the oligodendrocyte precursor cell (OPC). Differentiation arrest of the OPC lineage occurs in part from the overexpression of highly conserved RNA binding proteins (RBPs) which mediate pluripotency during normal fetal development and neonatal hyperplasia. Our work in the Saratsis Lab is focused on understanding the epigenetic background and molecular mechanisms of these RBPs. Specifically, we use techniques such as chromatin immunoprecipitation, genomic editing, tumor suppressor microRNA screens, and pharmaceutical inhibition to assess their targetability and translate novel therapeutic strategies into our advanced murine models.

Email: isaratsis@iuhealth.org

Felix Schweizer, Ph.D.

**Department of Neurobiology
David Geffen School of Medicine
UCLA
Los Angeles CA**

We are interested in molecular and cellular aspects of synaptic transmission, in the regulation of synaptic transmission and how this regulation affects neural systems. We are using acutely isolated neurons, brain slices and cultured cells in order to investigate these issues. We are using electrophysiology (incl. capacitance measurements), imaging and biochemical methods.

For more information please contact Professor Schweizer at felixs@ucla.edu or visit the lab website at <http://schweizerlab.org>

Neil Segil, Ph.D.

**House Ear Institute (USC)
Section on Cell Growth and Differentiation
Laboratory of Developmental Biology
Department of Cell and Molecular Biology**

1. Cell cycle regulation during the development and regeneration of the inner ear. Coordinating cell proliferation, growth and differentiation is crucial for the development of animal form. This project investigates the biochemical machinery responsible for this coordination. Including:
 - Regulation of cyclin-dependent kinases and their inhibitors in development.
 - Role of proneural and neurogenic genes in cell patterning, differentiation, and cell cycle control.
2. Stem cells and progenitors in the developing inner ear. The goal of this project is the identification and molecular characterization of progenitor cells (stem cells) that are able to differentiate into the sensory and non-sensory cells of the auditory and vestibular epithelium. This project involves the prospective identification, purification and growth in vitro of hair cell precursors. In the future, manipulation of these cells may offer an alternative to hearing aids and cochlear implants for the treatment of hearing loss.
3. Establishment and maintenance of the postmitotic state. We have shown that maintenance of the postmitotic state of inner ear sensory hair cells is an active process involving the cell type specific regulation of cyclin-dependent kinase inhibitors. Loss of the ability to maintain the postmitotic state leads to cell death. The focus of this project is on the molecular mechanisms that underlie the permanently postmitotic state of

terminally differentiated cells and the signaling pathways leading from cellular stress to the cell cycle machinery.

For more information: <http://www.hei.org/research/scientists/segil.html>. You may contact Dr. Segil at nsegil@hei.org.

Joshua Trachtenberg, Ph.D.

**Department of Neurobiology
Brain Research Institute
University of California, Los Angeles**

The goal of the research in my lab is to understand, on the level of single neurons and synaptic connections, how sensory information changes the "neural circuit" - the connections between neurons in the brain. It is quite clear that connections between brain cells are extremely labile when we are young (and wild and free), but progressively less so as we age out of adolescence, into adulthood, and old age. Yet it remains something of a mystery why. How is the young brain different than the adult brain? Why is it so trivial for children to learn new languages, symbolic representation, new motor movements, and so on?

To answer these questions, research in my lab employs imaging, genetic, optogenetic, pharmacogenetic, and electrophysiological tools to probe neural circuitry in the brains of adolescent and adult mice. A main technique in the lab is resonant scanning 2-photon calcium imaging, which allows us to visualize the activity of hundreds of neurons in the living brain with high spatial and temporal resolution. With this technique, we follow the activity of neuronal networks over hours, or days, or weeks and define exactly how the network changes before and after learning. We are also mapping neural circuit connectivity both in vivo, by modeling connectivity probabilities based on the calcium imaging data we acquire, and in brain slices using glutamate uncaging or channel-rhodopsin stimulation.

For more information on Dr. Trachtenberg's research please visit www.neurobio.ucla.edu.

Christopher Wilson, Ph.D.

**Basic Sciences
Division of Physiology
School of Medicine
Loma Linda University School of Medicine
Loma Linda, CA 92350**

My laboratory is primarily interested in the generation and modulation of respiratory rhythm in the mammalian central nervous system. In the past decade, we have focused on apnea of prematurity and other breathing problems that premature infants suffer. The

questions we seek to answer are: How does the brain generate the drive for breathing? How is breathing pattern modulated by reflexes and chemosensation? How can we improve breathing regularity in premature infants?

We use electrophysiology techniques (extracellular single-unit recording, whole cell patch-clamp, electrochemistry) and fluorescence imaging (calcium indicators, pH sensitive dyes, cell specific markers) to explore the dynamic relationship between cells that are phasically active during breathing. Our chief animal model is the developing rat but we also use mice to explore genetic variability in the respiratory neural substrate. For more information please visit [http:// www.llu.edu/medicine/basic-sciences/faculty/physiology/](http://www.llu.edu/medicine/basic-sciences/faculty/physiology/). Email: cgwilson.llu.edu