

**BRAIN RESEARCH INSTITUTE**

**UNIVERSITY OF CALIFORNIA, LOS ANGELES**

**53rd ANNUAL REPORT**

**July 1, 2013 to June 30, 2014**



## MISSION

The Brain Research Institute's mission is:

- to increase understanding of how the brain works, how it develops, and how it responds to experience, injury and disease;
- to help make UCLA the preeminent center for translating basic knowledge into medical interventions and new technologies; and
- to promote neuroscience education at all levels.

To execute this mission, the BRI functions explicitly as the interdisciplinary and non-departmental voice of the basic neuroscience community. The BRI's strategic goals are:

- to invigorate research programs and to nurture novel collaborations that bring together investigators from complementary fields;
- to stimulate the translation of basic knowledge into therapies and cures for diseases and injuries of the nervous system;
- to recruit outstanding faculty, postdoctoral fellows and graduate students;
- to strengthen existing educational programs by fostering the integration of insights from basic neuroscience, cell and molecular biology, cognitive science, engineering and clinical neuroscience; and
- to extend educational outreach programs about the brain into the community.

## HISTORY

The Brain Research Institute is an Organized Research Unit (O.R.U.) that fosters interdisciplinary research and education within the UCLA neuroscience community. At the present time it includes 339 members; 264 full members who are active faculty members, 66 emeritus members, and 9 corresponding members, representing 27 academic departments throughout the campus.

The generosity of the Gonda family made possible the newest home of the Brain Research Institute, the Gonda (Goldschmied) Neuroscience and Genetics Research Center. A formal dedication of this specially designed research center was held on December 15, 1998. The first three floors of this building are designated specifically for the support of neuroscience research and education.

Organization of the Institute began in the early 1950s. Under the leadership of Dr. H. W. Magoun, members of many departments with prominent interests in nervous system research were encouraged to develop closer relationships so they might broaden the scope of their investigative activities and extend the effectiveness of their educational efforts.

A formal proposal was written and reviewed, and late in 1959, Institute status was assigned by the University of California. Concurrently, plans were completed to erect a building to house the research projects. In 1958, construction of a structure containing 76,000 square feet of space began. Occupancy of the building started in March of 1961, and the official opening of the Brain Research Institute was held on October 14 and 15, 1961. Dr. John D. French served as Director during the period 1961 to 1976. He was followed by Dr. Carmine D. Clemente, who served from 1976 to 1987. Dr. Arnold B. Scheibel served as Acting Director from 1987-1990, and as Director until June 1995. Dr. Allan J. Tobin served as Director from July 1995 through December 2003. For the year 2004, Dr. Christopher Evans, Associate Director for Research, and Dr. Michael Levine, Associate Director for Education, served as Interim Co-Directors. In December 2004, Dr. Christopher Evans was appointed as Director of the BRI.



**Brain Research Institute  
Summary of Activities 2013-2014**

Number of Members	339
Number of Member Publications	1200
Collaborative Publications between two or more BRI members	446
Predoctoral Students under Supervision of BRI Members	319
Postdoctoral Students under Supervision of BRI Members	308
Total Funding Administered through the BRI Fiscal Office (BRI Training Grants)	\$ .89 million

**Annual Lectures and Prizes:**

H.W. Magoun Lecture presented by Alcino J. Silva.

Eva Mary Kavan Prize for Excellence in Research on the Brain recipient: Jamee Berg.

Charles Sawyer Distinguished Lecture presented by David Crews.

Samuel Eiduson Student Lecture presented by Satoru Miura.

The Arnold Scheibel Distinguished Postdoctoral Fellow in Neuroscience Lecture presented by Caroline Montojo.

**Guest Lectures**

The Joint Seminars in Neuroscience sponsored twenty-six guest lectures this year. The Joint Seminars in Neuroscience are sponsored by the Brain Research Institute, the Semel Institute for Neuroscience & Human Behavior and the David Geffen School of Medicine at UCLA. In addition, the Brain Research Institute sponsored or co-sponsored 75 guest lectures this year. For a complete list of the speakers and the title of their presentations, please see “Joint Seminars in Neuroscience” and “Special Lectures” within the “Instructional Activity” section of this report.

**Poster Session**

The BRI Neuroscience Poster Session, featuring the research of all UCLA neuroscientists, including predoctoral students and postdoctoral fellows, was initiated in 1989. This year, the 25th Annual Neuroscience Poster Session was held on December 3, 2013. The Poster Session was attended by well over 300 neuroscientists comprised of graduate students, postdoctoral fellows, and faculty members that represent a multitude of departments on campus. Over 150 posters were presented, many of which had been presented at the 43rd Annual Meeting of the Society for Neuroscience. The guest speaker this year was Dr. Martin Chalfie, Ph.D., Nobel Laureate in Chemistry 2008, and William R. Kenan Jr. Professor of Biological Sciences at Columbia University in New York. He presented, “Mechanosensory Transduction and its Modification in *C. elegans*,” to a standing-room-only crowd. This yearly poster session represents continuing efforts to educate investigators about state-of-the-art neuroscience research being conducted at UCLA.

**Special Conferences Sponsored or Co-Sponsored by the Brain Research Institute**

To view program schedules, please see “Special Conferences,” listed in the “Instructional Activity” section of this report.

**From the Frog Neuromuscular Junction to Bats & Beyond - A Symposium to Honor Alan Grinnell**

A symposium to honor Dr. Alan Grinnell, “From the Frog Neuromuscular Junction to Bats & Beyond,” was held on November 8, 2013. In 1964, attracted by the presence of Dr. Ted Bullock and Susumu Hagiwara at UCLA, Dr. Grinnell joined UCLA where he is currently in his 50<sup>th</sup> year. Throughout this time, he has continued to work both in echolocation (throughout the world) and in various aspects of synaptic physiology. He has served as Director of the Jerry Lewis Neuromuscular Research Center, Director of the Ahmanson Laboratory of Neurobiology, Chair of the Department of Physiological Science (currently the Department of Integrative Biology and Physiology), and since 2011, Dr. Grinnell has served as Associate Dean of Life Sciences at UCLA.

## **Neurodegenerative Disorders: Can Systems Neuroscience and Systems Biology Solve the Riddles?**

### **A UCLA and Gladstone Institutes Symposium**

“Neurodegenerative Disorders: Can Systems Neuroscience and Systems Biology Solve the Riddles,?” a UCLA and Gladstone Institutes symposium, organized by Dr. John Mazziotta, Department of Neurology, UCLA and Dr. Lennart Mucke from the Gladstone Institute of Neurological Disease in San Francisco was held on November 19, 2013.

## **The 12th Annual CNS Basic and Translational Science Symposium**

### **Bringing The Brain Back Into Medicine: From Gut Microbes To Behavioral Interventions**

The 12th Annual CNS Basic and Translational Science Symposium, “Bringing The Brain Back Into Medicine: From Gut Microbes To Behavioral Interventions,” was held on February 28, 2014. The symposium was sponsored by the UCLA Brain Research Institute, the UCLA Division of Digestive Diseases, the VA Greater Los Angeles Healthcare System/Brentwood Biomedical Research Institute, CURE Foundation, the Gail and Gerald Oppenheimer Family Foundation and the Morris A. Hazan Family Foundation.

## **Tools for Integrating and Planning Experiments in Neuroscience**

Tools for Integrating and Planning Experiments in Neuroscience, a full-day symposium was held on March 11, 2014. The increasing volume, complexity and interconnectedness of data and published studies in neuroscience make it difficult to determine what is known, what is uncertain, and how to contribute effectively to one’s field. The speakers in this ICLM symposium presented ideas and tools to tackle this increasingly urgent problem. The symposium was sponsored by the UCLA Semel Institute, the UCLA Brain Research Institute, and the Integrative Center for Learning & Memory at UCLA.

## **The 8th Annual Neural Microcircuits Training Program Symposium, “Dynamics of Neural Microcircuits”**

The 8th Annual Neural Microcircuits Training Program Symposium, “Dynamics of Neural Microcircuits” was held on May 8, 2014. The symposium was sponsored by the UCLA Department of Neurobiology, and the UCLA Brain Research Institute.

## **Steroids, Genes and the Brain: A New Dogma - A Symposium of the Laboratory of Neuroendocrinology**

The Laboratory of Neuroendocrinology at UCLA hosted a full-day symposium, “Steroids, Genes and the Brain: A New Dogma,” on May 23, 2014. The Laboratory of Neuroendocrinology (LNE) is a unit of the UCLA Brain Research Institute comprising 14 faculty laboratories with a common interest in neuroendocrinology, sex differences, and reproduction. The LNE fosters education and collaborative research in neuroendocrinology and sex differences, especially in areas concerning reproduction and disease. The organizing committee gratefully acknowledged support from the UCLA Brain Research Institute, the Departments of Neurobiology, and Integrative Biology & Physiology at UCLA, and the Doris Duke Charitable Foundation.

## **21st Annual Joint Symposium on Neural Computation**

In 1994, the Institute for Neural Computation at the University of California, San Diego hosted the first Joint Symposium on Neural Computation with the California Institute of Technology in Pasadena. The symposium brought together students and faculty for a day of short presentations. Since then, the symposium has rotated between UCSD, Caltech, UCI, UCLA, USC and UCR. This year, the 21<sup>st</sup> Annual Joint Symposium on Neural Computation was held at the University of California, Irvine on May 17, 2014.

## **The Integrative Center for Learning and Memory**

### **13<sup>th</sup> Annual Southern California Learning and Memory Symposium**

The Thirteenth Annual Southern California Learning & Memory Symposium was held on June 2 2014. This symposium is a yearly meeting primarily for Southern California laboratories interested in plasticity and learning. This year’s annual symposium was supported by the Brain Research Institute, and the David Geffen School of Medicine at UCLA.

## CAROL MOSS SPIVAK CELL IMAGING FACILITY

In March 2008, the BRI Cell Imaging Facility moved to the California Nanosystems Institute (CNSI) to join with the CNSI Advanced Light Microscopy Facility. The joined facility has since served over 1400 users representing over 250 labs at UCLA, LABioMed, Harbor-UCLA and Cedars Sinai Health Center as well as several industry laboratories (e.g. Nestlé, NanoH2O, Sonendo Inc., Agensys Inc.). The facility houses five Leica spectral confocal microscopes, three of which have multiphoton laser scanning ability. The facility now has a Spinning Disk Confocal Microscope, a Laser Microdissection System and will soon have a TIRF (Total Internal Reflectance) Microscope online. Additional techniques now available include: FRET (fluorescence resonance energy transfer) FLIM (fluorescence lifetime imaging), FRAP (fluorescence recovery after photobleaching) and STED (scanning transmission depletion microscopy, which allows imaging below the diffraction limit of normal light resolution) and spectral unmixing both on microscopic and macroscopic (small animal) imaging scales. Dr. Laurent Bentolila is the scientific director of the facility.

## INTEGRATIVE CENTERS FOR NEUROSCIENCE EXCELLENCE (ICNE)

The launch of six new Integrative Centers for Neuroscience Excellence (ICNE) will bring different areas of research excellence into the forefront and highlight the specific strengths of UCLA's neuroscience activities. The UCLA neuroscience community is very large, and research is conducted within a number of schools, institutes, departments and organized research units (ORUs) which can make it difficult to envision how all the components contribute to the whole. The ICNE, by giving an institutional "face" to different areas of neuroscience, will remedy this situation by providing a focused profile highlighting the diverse activities of the neuroscience community to potential students and the public. The proposed ICNE represent communities of scientists who share an interest in similar topics or techniques, and correspond roughly to the focused areas of research (FARs) that guide curriculum options for the Interdepartmental Ph.D. Program for Neuroscience. Each ICNE will develop its own identity. Each will have its own website, and receive endowment support to organize symposia and seminars, as well as facilitate coordination and cooperation in its particular field. There are six Integrative Centers for Neuroscience Excellence. Two ICNE have launched (the Integrative Center for Learning and Memory, and the Integrative Center for Neurogenetics) and four are in the process of development. The next center to be launched will be the Integrative Center for Neural Repair and will represent research concentrations in neural development, degeneration and repair. Future ICNE will be concentrated on neuroimaging, synapses, cells and circuits, and addiction neurobiology.

## AFFINITY GROUPS (\*upcoming ICNE)

A variety of interdisciplinary affinity groups, developed to provide scientific exchange on specific research topics, meet at regular intervals. A number of these groups have developed program project, center, and training grant proposals. These groups represent one of the greatest strengths of the Institute; the scientific depth and diversity of its membership, and their collaborative interaction. These affinity groups include:

<u>Affinity Group</u>	<u>Leader(s)</u>
Addictions Research Consortium*	Edythe London & Igor Spigelman
Astrocyte Biology	Baljit Khakh & Michael Sofroniew
Autism	Daniel Geschwind
Brain-Mind-Body Interactions	Michael Irwin
Brain Tumor Affinity Group	Linda Liau and Robert Prins
Circadian and Sleep Medicine	Christopher Colwell
Computational Neuroscience	Ladan Shams
Immunology in Neuroscience	James Waschek
Inner Ear	Felix Schweizer
Neural Repair*	Marie-Françoise Chesselet
Neural Stem Cells	Harley Kornblum
Neurobiology of <i>Drosophila melanogaster</i> and <i>C. Elegans</i>	David Krantz
Neuroendocrinology	Arthur Arnold
Neuroimaging/Cognition*	Susan Bookheimer

### Affinity Group

Neuronuclear Imaging Affinity Group  
Neurophysics & Neuroengineering  
Neuroscience History  
Songbird  
Stress, Pain and Emotion  
Synapse to Circuit Club\*  
Undergraduate Researchers in  
    Parkinson's Disease  
Zebra Fish

### Leader(s)

Daniel Silverman  
Mayank Mehta  
Joel Braslow & Russell Johnson  
Stephanie White  
Emeran Mayer  
Kelsey Martin & Larry Zipursky  
Marie-Françoise Chesselet  
  
Alvaro Sagasti

## Scientific and Educational Outreach Programs

### Brain Awareness Week March 2014

The UCLA Chapter of the Society for Neuroscience recognized Brain Awareness Week with a number of special events. "Project Brainstorm" and "Interaxon" conducted demonstrations and hands-on activities, laboratory tours in the Brain Research Institute, workshops and campus tours.

#### Project Brainstorm

The current outreach program of the Brain Research Institute and the Interdepartmental Graduate Program for Neuroscience, "Project Brainstorm," grew out of the former SPARCS (Special Achievement Rewards for College Scholars) Program that was developed by Dr. Arnold Scheibel and Ms. Norma Bowles of the ARCS Foundation (Achievement Rewards for College Scientists). The goal of Project Brainstorm is to stimulate interest in science for children and young adults by emphasizing the function and importance of the brain. Over 50 students in the Interdepartmental Graduate and Undergraduate Neuroscience Programs participate in the program and visit private and public schools in the Los Angeles area throughout the academic year.

#### Interaxon

Interaxon is an Undergraduate Neuroscience Educational Outreach Group founded in 2006 at UCLA (<http://interaxon.scienceontheweb.net>) by the first group of students to take the NS195 Project Brainstorm outreach course. Interaxon now consists of over 30 students, freshmen to senior, from a variety of majors (neuroscience, biology, physiological science, molecular and cell biology, and also economics, philosophy, foreign language, and international development). Interaxon reaches 1st-12th grade students, with as many as 6 presentations per quarter, and as many 150 students in a single school visit.

### New Initiatives

NeuroCamp was initiated in the summer of 2010. NeuroCamp invites students, drawn mainly from local high schools, to enjoy a crash course of lectures and hands-on exercises covering many aspects of the fundamentals of neuroscience. Students spend several hours attending lectures by UCLA professors and mastering a wide variety of laboratory techniques crucial to modern science. This intensive two-week course exposes students to the basics of neuroanatomy and molecular biology.

The BRI Outreach Program also sponsors science fairs off campus at local high schools and also at the state level. The BRI sponsors prizes at the Annual California State Science Fair, awarding multiple Neuroscience prizes for both the senior (grades 9-12) and junior (grades 6-8) levels. The BRI also sponsors prizes at the Los Angeles County Science Fair, and co-sponsors the LA BRAIN BEE (<http://www.losangelesbrainbee.com>). During the summer the BRI also places as many as 20 local high school students in research labs in the UCLA neuroscience community. The BRI also sponsors winners of local high school fairs as part of the Summer Internship Program.

**Publications:** *Neuroscience News* provides a quarterly update on Institute news and events.

**UCLA Neuroscience Research Seminars and Lectures** calendar is published bi-monthly.

The **BRI Annual Neuroscience Calendar** includes major national, international and UCLA neuroscience events throughout the year.



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## BRAIN RESEARCH INSTITUTE MEMBERS

All members of the Institute must be members of academic departments and devote their main research effort to programs advancing the knowledge of the function and structure of the brain and nervous system. The following list of BRI members attests to the broad depth and interdisciplinary nature of the Institute, its members, and their research endeavors.

At the end of the fiscal year 2013-2014, there were 339 members in the Brain Research Institute; 264 full members, 66 emeritus members, and 9 corresponding members. These faculty members represent 27 academic departments, 19 of which are in the School of Medicine, 5 in the College of Letters and Science, 1 in the Henry Samueli School of Engineering and Applied Science, 1 in the School of Dentistry, and 1 in the School of Nursing. In addition, investigators from many other departments of the University join in active collaborative research with BRI members.

<u>Name</u>	<u>Title</u>	<u>Research Interest</u>
Jeffrey R. Alger, Ph.D.	Professor of Neurology, and Radiological Sciences	Magnetic resonance imaging, magnetic resonance spectroscopy and diffusion tensor imaging of the brain
Lori Altshuler, M.D.	Professor of Psychiatry and Biobehavioral Sciences; Director, UCLA Mood Disorders Research Program	The UCLA Mood Disorders Research Program focuses on exploring the etiology of mood disorders through neuroimaging, evaluating factors associated with vulnerability to mood episodes, and finding new treatment options for individuals suffering from mood disorders
Anne M. Andrews, Ph.D.	Professor of Psychiatry and Biobehavioral Sciences, and Chemistry and Biochemistry	Understanding how the serotonin neurotransmitter system modulates complex behaviors including anxiety, mood, stress responsiveness, and learning and memory
Liana G. Apostolova, M.D.	Associate Professor of Neurology	Memory disorders and dementia
Arthur P. Arnold, Ph.D.	Distinguished Professor of Integrative Biology & Physiology; Director, Laboratory of Neuroendocrinology, Brain Research Institute	Hormonal and sex chromosomal factors that cause sex differences in physiology and disease, as a strategy for finding factors that protect from disease
Utpal Banerjee, Ph.D.	Professor and Chair of Molecular, Cell & Developmental Biology; Professor of Biological Chemistry	Signaling and metabolic control of development

<b>Mark Barad, M.D., Ph.D.</b>	Associate Professor of Psychiatry and Biobehavioral Sciences	Biological bases of fear extinction
<b>Jorge R. Barrio, Ph.D.</b>	Distinguished Professor of Molecular and Medical Pharmacology; Elizabeth and Thomas Plott Chair in Gerontology	Developing molecular imaging probes and investigating the intricate mechanisms of human disease
<b>George Bartzokis, M.D.</b>	Professor of Psychiatry and Biobehavioral Sciences	Brain imaging of neuropsychiatric disorders
<b>Michele A. Basso, Ph.D.</b>	Professor of Psychiatry and Biobehavioral Sciences	Cognitive neuroscience and movement disorders
<b>Ulrich Batzdorf, M.D.</b>	Professor of Neurosurgery; Director of Spine Surgery	Chiari malformations and spinal cord disorders
<b>Carrie E. Bearden, Ph.D.</b>	Professor of Psychiatry and Biobehavioral Sciences, and Psychology	Neurodevelopmental disorders; cognition, neuroimaging and genetics of mood disorders and psychosis
<b>Marvin Bergsneider, M.D.</b>	Associate Professor of Neurosurgery	Study of cerebral metabolism following traumatic brain injury using PET and intracranial pressure modeling
<b>Suraj P. Bhat, Ph.D.</b>	Associate Professor of Ophthalmology	Molecular genetics of the development of the vertebrate eye, relating gene activity to the realization of the phenotype of vision
<b>Robert M. Bilder, Ph.D.</b>	Michael E. Tennenbaum Family Professor of Psychiatry and Biobehavioral Sciences; Professor of Psychology	Translational phenotyping of cognition and neural systems, understanding neuropsychiatric syndromes as dimensional quantitative traits, and applying knowledge about neuroplasticity to enhance well-being in health
<b>James W. Bisley, Ph.D.</b>	Associate Professor of Neurobiology	Neural mechanisms underlying visual perception, visual attention and visual memory
<b>Gal Bitan, Ph.D.</b>	Associate Professor of Neurology	Structure-based drug development for amyloid-related diseases
<b>Douglas L. Black, Ph.D.</b>	Professor of Microbiology, Immunology & Molecular Genetics; Investigator, Howard Hughes Medical Institute	Regulation of pre-mRNA splicing and the biochemical mechanisms that control changes in splice sites

Hugh T. Blair, Ph.D.	Associate Professor of Psychology (Behavioral Neuroscience)	Neurobiology of learning, memory and motivation with an emphasis on the role of neural oscillations in the storage and processing of information
Aaron Blaisdell, Ph.D.	Professor of Psychology	Comparative psychology and animal cognition
Gene D. Block, Ph.D.	Professor of Psychiatry & Biobehavioral Sciences, and Integrative Biology & Physiology; Chancellor, UCLA	Circadian rhythms and aging
Dean Bok, Ph.D.	Distinguished Professor of Neurobiology, and Dolly Green Professor of Ophthalmology	Cell and molecular biology of the retina in health and disease
Susan Y. Bookheimer, Ph.D.	Joaquin Fuster Professor of Cognitive Neuroscience, Department of Psychiatry and Biobehavioral Sciences	Functional magnetic resonance imaging to understand disruptions in brain systems in patients with a range of neurological developmental and neuropsychiatric disorders
Yvette M. Bordelon, M.D., Ph.D.	Assistant Professor of Neurology	Identification of biomarkers, including the use of PET imaging ligands, and clinical trials in Huntington disease, Parkinson disease and other movement disorders
Anatol Bragin, Ph.D.	Professional Research Neurologist	<b>Basics</b> mechanisms of epilepsy
Joel T. Braslow, M.D., Ph.D.	Professor of Psychiatry and Biobehavioral Sciences, and History; Director, Neuroscience History Archives	History of the neurosciences and psychiatry
Nicholas C. Brecha, Ph.D.	Professor and Vice Chair of Neurobiology; Professor of Medicine	Retinal circuitry and transmitter systems mediating visual information processing
Arthur L. Brody, M.D.	Professor of Psychiatry & Biobehavioral Sciences	Molecular brain imaging of cigarette smokers
Jeff Bronstein, M.D., Ph.D.	Professor of Neurology, and Molecular Toxicology; Director, UCLA Movement Disorders Program	Genetic and environmental causes of Parkinson's disease to develop new therapies

<b>Dean V. Buonomano, Ph.D.</b>	Professor of Neurobiology, and Psychology	Neural computation and neural basis of learning and memory
<b>Samantha J. Butler, Ph.D.</b>	Assistant Professor of Neurobiology	Developmental neurogenetics; neural regeneration
<b>Joseph Caprioli, M.D.</b>	Professor of Ophthalmology; Chief, Glaucoma Division, Jules Stein Eye Institute	Detection of early glaucoma damage, neuroprotection as treatment for glaucoma, visual function in glaucoma, surgical outcomes
<b>S. Thomas Carmichael, M.D., Ph.D.</b>	Professor of Neurology	Mechanisms of brain repair after stroke
<b>Ellen M. Carpenter, Ph.D.</b>	Professor of Psychiatry and Biobehavioral Sciences; Associate Director for Science Outreach, Brain Research Institute; Chair, Interdepartmental Undergraduate Program for Neuroscience	Role of reelin signaling pathway in regulating cell migration in the brain and mammary gland
<b>Scott H. Chandler, Ph.D.</b>	Professor of Neuroscience, Department of Integrative Biology & Physiology	Neuronal mechanisms underlying ALS
<b>Andrew C. Charles, M.D.</b>	Professor of Neurology; Meyer and Renee Luskin Chair in Migraine and Headache Studies	Investigation of basic cellular neurophysiology and neuropharmacology with a particular focus on mechanisms of migraine
<b>Marie-Françoise Chesselet, M.D., Ph.D.</b>	Charles H. Markham Professor of Neurology; Chair and Distinguished Professor, Department of Neurobiology	Molecular mechanisms of neurodegenerative diseases and neural repair in the basal ganglia
<b>Francesco Chiappelli, Ph.D.</b>	Professor of Oral Biology, School of Dentistry	Comparative effectiveness and efficacy research and analysis for practice, with emphasis on the bridge between translational research and translational effectiveness, as it applies in particular to psychoneuroendocrine-osteimmunology
<b>Steven G. Clarke, Ph.D.</b>	Distinguished Professor of Chemistry and Biochemistry	Role of protein methylation reactions in the repair of age-damage and in the regulation of biological function

<b>Timothy F. Cloughesy, M.D.</b>	Professor of Neurology; Director, Neuro-Oncology Program; Co-Director, Henry Singleton Brain Cancer Research Program	Human brain tumors
<b>Mark S. Cohen, Ph.D.</b>	Professor of Psychiatry and Biobehavioral Sciences, Neurology, Radiological Sciences, Biomedical Physics, Psychology, and Biomedical Engineering	Applications and technology of neuroimaging
<b>John Colicelli, Ph.D.</b>	Professor of Biological Chemistry	Signal transduction in cancer and neurobiology
<b>Christopher S. Colwell, Ph.D.</b>	Professor of Psychiatry and Biobehavioral Sciences	Circadian and sleep medicine
<b>Ian A. Cook, M.D.</b>	Professor of Psychiatry and Biobehavioral Sciences	Improving the management of depression with research using existing treatments more effectively through biomarker guidance, developing new treatment approaches (neuromodulation) and expanding understanding of the pathophysiology of depression
<b>Edwin L. Cooper, Ph.D., Sc.D.</b>	Distinguished Professor of Neurobiology	Evolutionary development of the neuroimmune system; Evidence-based complementary and alternative medicine
<b>Giovanni Coppola, M.D.</b>	Associate Professor of Psychiatry and Biobehavioral Sciences, and Neurology	Understanding the genetic contribution to neurodegenerative and psychiatric disorders by using genetic, genomic, and integrative approaches
<b>Eain M. Cornford, Ph.D.</b>	Professor of Neurology; Chief, Neuropharmacology Laboratory, VAMC, West Los Angeles	Blood-brain barrier function
<b>Rachelle H. Crosbie-Watson, Ph.D.</b>	Professor of Integrative Biology & Physiology, and Neurology	Duchenne muscular dystrophy
<b>Mirella Dapretto, Ph.D.</b>	Professor of Psychiatry and Biobehavioral Sciences	Neuroimaging of language, social cognition, and developmental disorders such as autism

<b>Antonio A.F. De Salles, M.D., Ph.D.</b>	Professor of Neurosurgery, and Radiation Oncology	Functional Neurosurgery: Clinical aspects of Parkinson's disease after pallidotomy and basic research in Parkinsonism MPTP primate model including cell transplantation and growth factor injections in the non-human primate basal ganglia; Radiosurgery: Clinical research on application of radiosurgery for brain tumors, epilepsy, and chronic pain, and basic research on effects of ionizing radiation to cerebral vasculature and neuronal firing
<b>Jean S. de Vellis, Ph.D.</b>	Professor of Neurobiology, and Psychiatry and Biobehavioral Sciences; Director, Intellectual and Developmental Disabilities Research Center	Role of stem cells, glia and growth factors in neurodevelopment, developmental diseases and regeneration
<b>Andrew C. Dean, Ph.D.</b>	Assistant Professor of Psychiatry and Biobehavioral Sciences	Neuropsychology of substance abuse
<b>Antonio V. Delgado-Escueta, M.D.</b>	Professor of Neurology; Director, Epilepsy Center of Excellence, GLAVA Healthcare System	Molecular genetics of epilepsy
<b>Joseph L. Demer, M.D., Ph.D.</b>	Professor of Ophthalmology, and Neurology	Translational studies of neural and mechanical control of ocular motility in animal models, and in normal and clinical human populations using neuroanatomical, biomechanical, physiological, and functional imaging methods
<b>Patricia I. Dickson, M.D.</b>	Associate Professor of Pediatrics	Therapy for pediatric neurodegenerative diseases
<b>Joseph J. DiStefano, III, Ph.D.</b>	Distinguished Professor of Computer Science, Medicine, and Biomedical Engineering	Computational systems biology
<b>Bruce H. Dobkin, M.D.</b>	Professor of Neurology; Medical Director, Neurologic Rehabilitation and Research Unit	Rehabilitation interventions and monitoring and outcome measurements to improve motor skills after brain and spinal cord lesions
<b>Lars Dreier, Ph.D.</b>	Assistant Professor of Neurobiology	The function of ubiquitin ligases in the formation of synapses and neurodegenerative disease in the genetic model organism <i>C. Elegans</i> and mammalian systems



<b>V. Reggie Edgerton, Ph.D.</b>	Distinguished Professor of Integrative Biology & Physiology, Neurobiology, and Neurosurgery	Investigations focus on how the spinal cord controls posture and locomotion and the potential and mechanisms of the plasticity of the spinal cord and muscles following spinal cord injury
<b>Benjamin M. Ellingson, Ph.D.</b>	Assistant Professor in Residence of Radiological Sciences	Neuro-oncology neuroimaging; MR and PET physics, epilepsy, imaging biomarkers
<b>Jerome Engel, Jr., M.D., Ph.D.</b>	Jonathan Sinay Distinguished Professor of Neurology, Neurobiology, and Psychiatry and Biobehavioral Sciences; Director, UCLA Seizure Disorder Center	Epilepsy
<b>Christopher J. Evans, Ph.D.</b>	Stefan Hatos Professor of Psychiatry and Biobehavioral Sciences; Director, Brain Research Institute	Neurobiology of drugs of abuse and neuroimmune interactions
<b>Gordon L. Fain, Ph.D.</b>	Distinguished Professor of Integrative Biology & Physiology	Physiology of vertebrate photoreceptors
<b>Guoping Fan, Ph.D.</b>	Professor of Human Genetics	Epigenetic mechanisms in neural development and stem cell regulation
<b>Michael S. Fanselow, Ph.D.</b>	Distinguished Professor of Psychology, and Psychiatry and Biobehavioral Sciences	Neural mechanisms of learning, memory and emotion
<b>Debra B. Farber, Ph.D., D.Ph.h.c.</b>	Distinguished Professor of Ophthalmology	Animal models of retinal degeneration; biochemistry, molecular biology, and genetics of retinal degenerations; gene regulation and gene therapy, retinitis pigmentosa and allied human diseases, and ocular albinism
<b>Kym F. Faull, Ph.D.</b>	Professor of Psychiatry and Biobehavioral Sciences; Director, Pasarow Mass Spectrometry Laboratory	Monitoring compounds that are important in cellular communication, and relating their concentrations and turnover to cellular homeostasis
<b>Jack L. Feldman, Ph.D.</b>	Distinguished Professor of Neurobiology	Neural control of movement
<b>Jamie D. Feusner, M.D.</b>	Associate Professor of Psychiatry and Biobehavioral Sciences	Phenotypes of perception, emotion, and obsession across body image and anxiety disorders

<b>L. Jaime Fitten, M.D.</b>	Professor of Psychiatry and Biobehavioral Sciences	Attentional dysfunction in Alzheimer's disease and its implications for motor vehicle operation
<b>Brent L. Fogel, M.D., Ph.D.</b>	Assistant Professor of Neurology	Molecular pathogenesis of neurodevelopmental and neurodegenerative disease
<b>Nelson B. Freimer, M.D.</b>	Maggie Gilbert Professor of Bipolar Disorders, Department of Psychiatry and Biobehavioral Sciences; Director, Center for Neurobehavioral Genetics; Associate Director, Research Programs, Semel Institute for Neuroscience & Human Behavior	The genetic basis of complex traits, particularly neurobehavioral phenotypes such as bipolar disorder, Tourette Syndrome, and temperament
<b>Itzhak Fried, M.D., Ph.D.</b>	Professor of Psychiatry and Biobehavioral Sciences, and Neurosurgery; Director, Epilepsy Surgery; Co-Director, Seizure Disorder Center	Neuronal basis of cognitive processing in the human brain
<b>Mark A. Frye, Ph.D.</b>	Professor of Integrative Biology & Physiology, and Neurobiology	Sensory neurobiology, motor control, and behavior
<b>Denson G. Fujikawa, M.D.</b>	Clinical Professor of Neurology	<i>In vivo</i> programmed mechanisms of seizure and methamphetamine-induced neuronal necrosis
<b>Andrew J. Fuligni, Ph.D.</b>	Professor of Psychiatry and Biobehavioral Sciences, and Psychology	Adolescent development, neural and biological mechanisms of the impact of social and cultural experience on health and development
<b>Adriana Galván, Ph.D.</b>	Associate Professor of Psychology (Developmental Area)	Adolescent brain development
<b>Daniel H. Geschwind, M.D., Ph.D.</b>	The Gordon & Virginia MacDonald Distinguished Professor of Human Genetics; Professor of Neurology, and Psychiatry and Biobehavioral Sciences; Director, Neurogenetics Program; Director, UCLA Center for Autism Research and Treatment	Uncovering the molecular and genetic bases of neurodevelopmental and neurodegenerative diseases using an array of cell biologic, molecular biologic, network biologic, and bioinformatic strategies

<b>Christopher C. Giza, M.D.</b>	Professor of Neurosurgery, and Pediatrics (Pediatric Neurology)	Developmental traumatic brain injury and neuroplasticity; functional and structural neuroimaging
<b>David L. Glanzman, Ph.D.</b>	Professor of Integrative Biology and Physiology, and Neurobiology	Neurobiology of learning and memory in simple systems
<b>Vay Liang W. Go, M.D.</b>	Distinguished Professor of Medicine (Digestive Diseases)	Neuro-hormonal integration of metabolism
<b>Peyman Golshani, M.D., Ph.D.</b>	Assistant Professor of Neurology	GABAergic network function in awake behaving mice; GABAergic network dysfunction in models of autism and developmental epilepsy
<b>Fernando Gómez-Pinilla, Ph.D.</b>	Professor of Neurosurgery, and Integrative Biology & Physiology	Plasticity of brain and spinal cord
<b>Michael B. Gorin, M.D., Ph.D.</b>	Professor of Ophthalmology, and Human Genetics	Clinical and molecular aspects of hereditary ocular disorders, especially retinal and macular dystrophies, complex genetic disorders and the neural pathways and molecules related to light-related sensitivity and pain (photophobia) associated with both central and eye-related disorders
<b>Robert J. Greenberg, Ph.D.</b>	Adjunct Assistant Professor of Electrical Engineering	Retinal degeneration and retinal prostheses
<b>Carlos V. Grijalva, Ph.D.</b>	Professor of Psychology; Associate Dean, Graduate Division	Activity-based anorexia and neuroendocrine mechanisms
<b>Alan D. Grinnell, Ph.D.</b>	Distinguished Professor of Physiology, and Integrated Biology and Physiology; Director, Ahmanson Laboratory of Neurobiology; Associate Dean of Life Sciences	Synaptic mechanisms
<b>William Grisham, Ph.D.</b>	Adjunct Professor of Psychology	Birdsong and sex differences in the brain
<b>Warren S. Grundfest, M.D., FACS</b>	Professor of Bioengineering, Electrical Engineering, and Surgery	Biophotonics, brain mapping, minimally invasive surgery, biologic spectroscopy, and haptic feedback
<b>Cameron B. Gundersen, Ph.D.</b>	Professor of Molecular and Medical Pharmacology	Presynaptic structure and function

<b>Ming Guo, M.D., Ph.D.</b>	Associate Professor of Neurology, and Molecular & Medical Pharmacology	Molecular mechanisms of neurodegenerative disorders in <i>Drosophila</i>
<b>Zhefeng Guo, Ph.D.</b>	Assistant Professor of Neurology	Structural biology of amyloid-related neurodegenerative diseases
<b>Karen H. Gyls, Ph.D., R.N.</b>	Professor, School of Nursing	Alzheimer's disease; apoE and synaptic pathology; biomarkers
<b>Elissa A. Hallem, Ph.D.</b>	Assistant Professor of Microbiology, Immunology, and Molecular Genetics	Odor-driven behaviors of free-living parasitic nematodes
<b>Ronald M. Harper, Ph.D.</b>	Distinguished Professor of Neurobiology	Neural mechanisms underlying cardiovascular and respiratory control during sleep and waking states
<b>Neil G. Harris, Ph.D.</b>	Associate Professor of Neurosurgery	Traumatic brain injury and mechanisms of neural plasticity/recovery of function including neurogenesis
<b>Volker Hartenstein, M.D., Ph.D.</b>	Professor of Molecular, Cell & Developmental Biology	<i>Drosophila</i> brain development and digital reconstruction; stem cells and their niches in invertebrate model systems
<b>Leif Havton, M.D., Ph.D.</b>	Associate Professor of Neurology	Neural repair after spinal cord injury
<b>Chih-Ming Ho, Ph.D.</b>	Ben Rich-Lockheed Martin Professor of Mechanical & Aerospace Engineering; Director, Institute for Cell Mimetic Space Exploration; Associate Vice Chancellor for Research	Rapid identification of optimal combinatorial drugs
<b>Larry F. Hoffman, Ph.D.</b>	Adjunct Professor of Surgery (Head & Neck)	Sensory neuroscience, particularly in the inner ear vestibular system; systems and computational neuroscience; neural repair; sensory learning
<b>Joshua A. Hoffs, M.D.</b>	Associate Clinical Professor of Psychiatry and Biobehavioral Sciences	Mind-brain-integration
<b>Keith J. Holyoak, Ph.D.</b>	Distinguished Professor of Psychology	Thinking and reasoning

<b>Carolyn R. Houser, Ph.D.</b>	Professor of Neurobiology	Morphological and neurochemical plasticity of GABA neurons and GABA <sub>A</sub> receptors in temporal lobe epilepsy and Fragile X syndrome
<b>David A. Hovda, Ph.D.</b>	Professor of Neurosurgery, and Molecular and Medical Pharmacology	Brain injury and recovery of function
<b>Sherrel Howard, Ph.D.</b>	Associate Professor of Molecular and Medical Pharmacology, and Psychiatry and Biobehavioral Sciences	Dopamine receptors, oligodendrocyte development, drugs of abuse
<b>Yih-Ing Hser, Ph.D.</b>	Professor of Psychiatry and Biobehavioral Sciences	Life course addiction, health services research, longitudinal research and statistical methodologies for studying addictive disorders
<b>Wayne L. Hubbell, Ph.D.</b>	Jules Stein Professor of Ophthalmology; Distinguished Professor of Chemistry and Biochemistry	Molecular basis of membrane excitation
<b>Marco Iacoboni, M.D., Ph.D.</b>	Professor of Psychiatry and Biobehavioral Sciences	Human systems neuroscience using brain imaging and neuromodulation
<b>Louis J. Ignarro, Ph.D.</b>	Professor of Molecular and Medical Pharmacology; Jerome J. Belzer Chair—Medical Research	Nitric oxide, vascular physiology, cellular proliferation
<b>Michael R. Irwin, M.D.</b>	Cousins Professor of Psychiatry and Biobehavioral Sciences; Director, Cousins Center for Psychoneuroimmunology; Professor of Psychology	Interactions between behavior and immunity, consequences of major depression on immune processes relevant to infectious disease and inflammatory disorders
<b>Alicia Izquierdo, Ph.D.</b>	Associate Professor of Psychology	Brain mechanisms of optimal choices
<b>Joanna C. Jen, M.D., Ph.D.</b>	Professor of Neurology	Disease mechanisms, diagnosis, and treatment for neurological disorders affecting balance, coordination, and eye movement control
<b>J. David Jentsch, Ph.D.</b>	Professor of Psychology, and Psychiatry and Biobehavioral Sciences; Associate Director for Research, Brain Research Institute	Genetic and neurochemical influences on cognitive and executive functions in laboratory animals

<b>Shafali Spurling Jeste, M.D.</b>	Assistant Professor of Psychiatry and Biobehavioral Sciences, and Neurology	High-density electrophysiology to characterize infants at high risk and young children with autism and related neurodevelopmental disorders, to define neural predictors of outcome in this population
<b>H. Ronald Kaback, M.D.</b>	Distinguished Professor of Physiology	Structure and function of membrane transport proteins
<b>Bruce L. Kagan, M.D., Ph.D.</b>	Clinical Professor of Psychiatry and Biobehavioral Sciences	Amyloid peptide channels: role in pathophysiology of disease
<b>Daniel L. Kaufman, Ph.D.</b>	Professor of Molecular and Medical Pharmacology	Neuroimmunology, neurodevelopment, immunotherapeutics for neurodegenerative disease
<b>Pamela J. Kennedy, Ph.D.</b>	Assistant Professor of Psychology	Motivation, memory and drug abuse
<b>Baljit S. Khakh, Ph.D.</b>	Professor of Physiology, and Neurobiology; Executive Vice Chair of Physiology	ATP signaling and glial biology in neuronal circuits
<b>Barbara J. Knowlton, Ph.D.</b>	Professor and Vice Chair for Undergraduate Programs, Department of Psychology	Cognitive neuroscience of memory and executive function
<b>Carla M. Koehler, Ph.D.</b>	Professor of Chemistry and Biochemistry	Protein import into mitochondria; understanding how mitochondrial dysfunction contributes to disease
<b>Brian J. Koos, M.D., Ph.D.</b>	Professor and Vice Chair (Academic Affairs) of Obstetrics and Gynecology	Fetal behavior and cardiovascular responses to hypoxia
<b>Harley I. Kornblum, M.D., Ph.D.</b>	Professor of Psychiatry & Biobehavioral Sciences, Molecular & Medical Pharmacology, and Pediatrics	Neural stem cells and brain tumors
<b>David E. Krantz, M.D., Ph.D.</b>	Professor of Psychiatry and Biobehavioral Sciences	Molecular mechanisms that regulate neurotransmitter release with a focus on the function of neurotransmitter transporters using the model organism <i>Drosophila melanogaster</i>
<b>Carol A. Kruse, Ph.D.</b>	Adjunct Professor of Neurosurgery	Immune and gene therapy for brain tumors

<b>Rajesh Kumar, Ph.D.</b>	Assistant Professor of Anesthesiology, and Radiological Sciences	Examination of neural tissue integrity in breathing and cardiovascular disease conditions
<b>Ira Kurtz, M.D.</b>	Professor of Medicine (Nephrology); Chief, Division of Nephrology; Factor Chair in Molecular Nephrology	Physiological and biophysical studies of acid-base transport proteins in sensory and extrasensory organs
<b>Jennifer S. Labus, Ph.D.</b>	Adjunct Assistant Professor of Psychiatry and Biobehavioral Sciences	Delineating the neural networks underlying the neurobiology of stress with a specific emphasis on models of functional and persistent pain and brain-body interactions
<b>Albert Lai, M.D., Ph.D.</b>	Associate Professor of Neurology	Correlation of genomics/epigenomics with phenotype to identify prognostic and predictive biomarkers for malignant gliomas
<b>Joseph L. Lasky, III, M.D.</b>	Associate Clinical Professor of Pediatrics (Hematology/Oncology), and Neurosurgery	Novel therapies for pediatric cancers, especially brain tumors; methods to stimulate the immune system to attack brain tumors, and how to target the immune system against putative brain tumor stem cells
<b>Andrew F. Leuchter, M.D.</b>	Professor of Psychiatry and Biobehavioral Sciences; Director, Laboratory of Brain, Behavior and Pharmacology; Director, Office of Professional and Community Education	The enhancement of treatment outcomes in depression using brain-imaging techniques (QEEG, MRI, PET) to examine brain function and predict which treatments are most likely to benefit individual patients
<b>Michel F. Lévesque, M.D.</b>	Associate Clinical Professor of Neurosurgery	Endogenous and autologous neural stem cell repair of neurodegenerative disorders
<b>Barbara A. Levey, M.D.</b>	Professor of Medicine, and Molecular & Medical Pharmacology; Assistant Vice Chancellor of Biomedical Affairs	Graduate education; clinical pharmacology and clinical research

<b>Michael S. Levine, Ph.D.</b>	Distinguished Professor of Psychiatry and Biobehavioral Sciences; Associate Director, Intellectual and Developmental Disabilities Research Center; Associate Director for Education, Brain Research Institute; Chair, Graduate Interdepartmental Program for Neuroscience	The mechanisms underlying neuronal dysfunction in the basal ganglia and cortex in neurodegenerative disorders
<b>Linda M. Liaw, M.D., Ph.D.</b>	Professor of Neurosurgery	Brain tumor molecular biology, and immunology
<b>Shuo Lin, Ph.D.</b>	Professor of Molecular, Cell and Developmental Biology	Developmental biology of the nervous system and regulation of neural gene expression
<b>Walter Ling, M.D.</b>	Professor of Psychiatry and Biobehavioral Sciences	Development and evaluation of pharmacotherapy-based and behavioral therapies for treatment of drug dependence; pain
<b>Xin Liu, M.D., Ph.D.</b>	Assistant Professor of Pathology and Laboratory Medicine, and Molecular and Medical Pharmacology	Molecular genetics and neurobiology
<b>Zili Liu, Ph.D.</b>	Associate Professor of Psychology	Visual perception, computation, and learning
<b>Edythe D. London, Ph.D.</b>	Thomas and Katherine Pike Professor of Addiction Studies, Department of Psychiatry and Biobehavioral Sciences	Multimodal neuroimaging approaches to study the neuronal circuits and molecular mediators of self-control in healthy and pathological states
<b>Sandra K. Loo, Ph.D.</b>	Associate Professor of Psychiatry and Biobehavioral Sciences	Gene-brain-behavior pathways evident in childhood psychiatric disorders and translation of this work to improve treatments for these disorders
<b>Aldons J. Lusis, Ph.D.</b>	Professor and Co-Vice-Chair, Department of Human Genetics; Professor of Microbiology, Immunology & Molecular Genetics, and Professor of Medicine	Systems genetics to understand higher order interactions in complex disease
<b>Karen M. Lyons, Ph.D.</b>	Professor of Molecular, Cell & Developmental Biology, and Orthopedic Surgery	Bone morphogenetic proteins (BMP); skeletal development



<b>Paul M. Macey, Ph.D.</b>	Assistant Professor, School of Nursing	Sleep disorders and central regulation of autonomic function, including cardiovascular and affective functions
<b>Nigel T. Maidment, Ph.D.</b>	Professor of Psychiatry and Biobehavioral Sciences	Neurobiology of motivated behavior and neurodegenerative disease
<b>Kelsey C. Martin, M.D., Ph.D.</b>	Professor and Chair of Biological Chemistry	Cell biology of long-term memory
<b>Juan Carlos Marvizón, Ph.D.</b>	Adjunct Associate Professor of Medicine (Digestive Diseases)	Neurophysiology of pain and analgesia; cellular and molecular mechanisms that mediate central sensitization in the spinal cord
<b>Sotiris C. Masmanidis, Ph.D.</b>	Assistant Professor of Neurobiology	Network-level neuronal mechanisms of reward-mediated learning
<b>Gary W. Mathern, M.D.</b>	Professor of Neurosurgery, and Psychiatry and Biobehavioral Sciences	Analysis of human brain tissue removed from pediatric and adult epilepsy surgery patients to identify basic mechanisms of epileptogenesis with the goal of developing new translational methods to diagnose and treat patients
<b>Emeran A. Mayer, M.D.</b>	Professor of Medicine, Physiology, and Psychiatry and Biobehavioral Sciences; Director, Oppenheimer Family Center for Neurobiology of Stress; Associate Director, CURE: Digestive Diseases Research Center	Interception at the interface between stress, pain and emotions in health and disease
<b>John C. Mazziotta, M.D., Ph.D.</b>	Associate Vice Chancellor, Executive Vice Dean, David Geffen School of Medicine at UCLA; Chair, and Frances Stark Professor of Neurology; Director, UCLA Brain Mapping Center; Professor of Neurology, Radiological Sciences, and Molecular & Medical Pharmacology	Imaging the structure and function of the human brain in health and disease
<b>James T. McCracken, M.D.</b>	Joseph Campbell Professor of Child Psychiatry and Biobehavioral Sciences; Director, Child and Adolescent Psychiatry	Treatment of early-onset psychiatric disorders, studies of risk factors, including genes, for neuropsychiatric disorders such as ADHD and OCD

<b>Dennis J. McGinty, Ph.D.</b>	Adjunct Professor of Psychology; Chief, Neurophysiology Research, Sepulveda VAMC	Sleep neurobiology
<b>Mayank R. Mehta, Ph.D.</b>	Professor of Physics & Astronomy, Neurology, and Neurobiology	Electrophysiological and computational study of cortico- hippocampal interaction during spatial navigation and sleep, and its influence on learning and memory
<b>William P. Melega, Ph.D.</b>	Professor of Molecular and Medical Pharmacology, and Molecular Toxicology	Molecular mechanisms of neurodegenerative diseases and drug addiction
<b>Walter Metzner, Ph.D.</b>	Professor and Vice Chair of Integrative Biology & Physiology	Behavioral neurobiology (neuroethology) of auditory-vocal interaction in mammals (echo- locating bats)
<b>Paul E. Micevych, Ph.D.</b>	Professor of Neurobiology, and Surgery (Head & Neck Surgery)	Reproductive neuroendocrinology
<b>Gregory A. Miller, Ph.D.</b>	Distinguished Professor and Chair of Psychology; Distinguished Professor of Psychiatry and Biobehavioral Sciences	Brain mechanisms in psychopathology
<b>Thomas R. Minor, Ph.D.</b>	Professor of Psychology	Animal models of anxiety and depression; stress resilience; hormetic stress
<b>Istvan Mody, Ph.D.</b>	Tony Coelho Professor of Neurology, and Professor of Physiology	GABAergic neurotransmission in health and disease
<b>Bartly J. Mondino, M.D.</b>	Bradley R. Straatsma Professor of Ophthalmology; Chair, Department of Ophthalmology; Director, Jules Stein Eye Institute; Chief, Cornea-External Disease Division	Cornea-external disease
<b>Martin M. Monti, Ph.D.</b>	Assistant Professor of Psychology	The relationship between language and thought; consciousness after severe brain injury
<b>Norman S. Namerow, M.D.</b>	Clinical Professor of Neurology, and Psychiatry	Chronic pain
<b>Peter M. Narins, Ph.D.</b>	Distinguished Professor of Integrative Biology & Physiology, and Ecology and Evolutionary Biology	Auditory neurophysiology and behavior

<b>Katherine L. Narr, Ph.D.</b>	Assistant Professor of Neurology	Applied neurobiological imaging in psychiatric disorders
<b>Valeriy Nenov, Ph.D.</b>	Adjunct Associate Professor of Neurosurgery, and Biomedical Engineering	Development of Java-based telemedical applications for remote monitoring of patients in intensive care; computational modeling of memory functions of the hippocampus
<b>Bennett G. Novitch, Ph.D.</b>	Associate Professor of Neurobiology	Molecular mechanisms controlling neural stem cell maintenance and differentiation
<b>Erika L. Nurmi, M.D., Ph.D.</b>	Assistant Professor of Psychiatry and Biobehavioral Sciences	Neuropsychiatric genetics
<b>Marc R. Nuwer, M.D., Ph.D.</b>	Professor of Neurology	New clinical applications for EEG and evoked potentials, demonstrations of usefulness, creation of new public policy, and outcome studies
<b>Thomas J. O'Dell, Ph.D.</b>	Professor and Executive Vice Chair of Physiology; Interim Chair of Physiology	Cellular and molecular mechanisms underlying activity-dependent forms of synaptic plasticity
<b>Paul H. O'Lague, Ph.D.</b>	Associate Professor of Molecular, Cell & Developmental Biology	Mathematical modeling of osmoregulation using phase transition physics to model osmoregulation in cells
<b>Riccardo Olcese, Ph.D.</b>	Professor of Anesthesiology, and Physiology	Physiology and biophysics of ion channels and their role in cell function and cardiac arrhythmias
<b>Richard W. Olsen, Ph.D.</b>	Distinguished Professor of Molecular and Medical Pharmacology	GABA-A receptor structure and function: GABA-A receptor plasticity induced by acute and chronic ethanol in rats; Sites for allosteric modulatory ligands like general anesthetics and ethanol on mammalian brain GABA-A receptors
<b>Roel A. Ophoff, Ph.D.</b>	Professor of Psychiatry and Biobehavioral Sciences, and Human Genetics	Identification of genetic susceptibility of complex traits, in particular neuropsychiatric illnesses such as schizophrenia and bipolar disorder

<b>Thomas Otis, Ph.D.</b>	Edith Agnes Plumb Endowed Chair in Neurobiology; Professor and Chair of Neurobiology	Cerebellar physiology, spinocerebellar ataxias
<b>Diane M. Papazian, Ph.D.</b>	Professor of Physiology	Research focuses on the role of electrical excitability in neurodevelopmental and neurodegenerative diseases
<b>Patricia E. Phelps, Ph.D.</b>	Professor and Vice Chair of Integrative Biology & Physiology	Axon regeneration following complete spinal cord transection and olfactory ensheathing cell transplantation ; the effects of the Reelin signaling pathway on pain processing in the dorsal horn of the spinal cord
<b>Natik Piri, Ph.D.</b>	Associate Professor of Ophthalmology	Retinal ganglion cells and optic neuropathies
<b>Whitney B. Pope, M.D., Ph.D.</b>	Assistant Professor of Radiological Sciences (Neuroradiology)	Advanced imaging of brain tumor
<b>Carlos Portera-Cailliau, M.D., Ph.D.</b>	Associate Professor of Neurology, and Neurobiology	The assembly and plasticity of cortical circuits in health and disease
<b>Nader Pouratian, M.D., Ph.D.</b>	Assistant Professor of Neurosurgery	Brain mapping, neuromodulation, and neural prostheses
<b>Mayumi L. Prins, Ph.D.</b>	Associate Professor of Neurosurgery	Traumatic brain injury
<b>Robert M. Prins, Ph.D.</b>	Associate Professor of Neurosurgery, and Molecular and Medical Pharmacology	Immune-based therapies for brain tumors
<b>Javier Quintana, M.D., Ph.D.</b>	Associate Professor of Psychiatry and Biobehavioral Sciences	Neural bases of social cognition deficits in schizophrenia
<b>Richard Rawson, Ph.D.</b>	Professor of Psychiatry and Biobehavioral Sciences; Associate Director, Integrated Substance Abuse Programs (ISAP)	Research on addiction medications, psychosocial trails and dissemination of research findings nationally and internationally
<b>Lara A. Ray, Ph.D.</b>	Associate Professor of Psychology (Clinical Area), and Psychiatry & Biobehavioral Sciences	The etiology and treatment of substance use disorders, integrating experimental psychopathology, behavioral genetics, and pharmacology

<b>Dario L. Ringach, Ph.D.</b>	Professor of Neurobiology, and Psychology	Visual electrophysiology and psychophysics, mathematical modeling of receptive field function, cortical dynamics
<b>Jesse A. Rissman, Ph.D.</b>	Assistant Professor of Psychology, and Psychiatry and Biobehavioral Sciences	Functional neuroimaging studies of human memory and cognitive control
<b>Leonard H. Rome, Ph.D.</b>	Professor of Biological Chemistry	The study of biogenesis and function of novel subcellular organelles called vaults
<b>Roland R. Roy, Ph.D.</b>	Researcher, Brain Research Institute, and Integrative Biology & Physiology	Plasticity of the neuromuscular system under chronic conditions of increased or decreased neuromuscular activity
<b>Fred W. Sabb, Ph.D.</b>	Assistant Professor of Psychiatry and Biobehavioral Sciences	Novel technological approaches to cognitive neuroscience and neuroinformatics in order to elucidate the biological origins of major mental illness
<b>Alvaro Sagasti, Ph.D.</b>	Associate Professor of Molecular, Cell & Developmental Biology	Development and plasticity of somatosensory neuron axon arbors in larval zebrafish
<b>Alapakkam P. Sampath, Ph.D.</b>	Associate Professor of Ophthalmology	Retinal signal processing and neurophysiological mechanisms establishing visual sensitivity
<b>Albert Sattin, M.D.</b>	Associate Clinical Professor of Psychiatry and Biobehavioral Sciences: Chief, Antidepressant Neuropharmacology Laboratory, West Los Angeles VAMC	The role of TRH and related peptides in CNS function
<b>Stan Schein, M.D., Ph.D.</b>	Professor of Psychology	Retinal circuits and color vision; retinal synapses and synaptic release processes; endocytosis and fullerene self-assembly
<b>Barnett A. Schlinger, Ph.D.</b>	Professor and Chair of Integrative Biology & Physiology; Professor of Ecology and Evolutionary Biology	Neurosteroid synthesis and actions; neuroethology
<b>Felix E. Schweizer, Ph.D.</b>	Professor of Neurobiology	Physiological and molecular mechanisms of neuronal communication at synapses
<b>Ladan Shams, Ph.D.</b>	Associate Professor of Psychology	Multisensory integration, visual perception, perceptual learning

<b>Steven Shoptaw, Ph.D.</b>	Professor and Vice Chair of Research, Family Medicine, and Professor of Psychiatry and Biobehavioral Sciences	Clinical trials of medications for stimulant dependence
<b>Nancy L. Sicotte, M.D.</b>	Associate Professor of Neurology, Division of Brain Mapping	Multimodal imaging in multiple sclerosis
<b>Jerome M. Siegel, Ph.D.</b>	Professor of Psychiatry and Biobehavioral Sciences; Chief, Neurobiology Research, Veterans, Sepulveda VAMC	Sleep, arousal and the function of orexin (hypocretin) neurons
<b>Alcino J. Silva, Ph.D.</b>	Professor of Neurobiology, Psychiatry & Biobehavioral Sciences, and Psychology	Molecular and cellular mechanisms underlying learning and memory and its disorders, including age-related cognitive decline, autism and schizophrenia
<b>Daniel H. Silverman, M.D., Ph.D.</b>	Professor of Molecular and Medical Pharmacology	Neurological basis for, and optimizing evaluation and management of, cognitive dysfunction secondary to a wide array of insults (neurodegenerative, hormonal, pharmacologic, traumatic)
<b>Dwayne D. Simmons, Ph.D.</b>	Professor of Integrative Biology & Physiology; Director, Minority Access to Research Careers Program	Synapse formation and sensory cell development
<b>Elyse J. Singer, M.D.</b>	Professor of Neurology	NeuroAIDS
<b>Gary W. Small, M.D.</b>	Parlow-Solomon Professor on Aging; Professor of Psychiatry and Biobehavioral Sciences; Director, Longevity Center; Director, Geriatric Psychiatry Division, UCLA	Early detection and prevention of age-related memory loss and dementia
<b>Desmond J. Smith, M.D., Ph.D.</b>	Professor of Molecular and Medical Pharmacology	Genetics of behavioral, neuropsychiatric and neurodegenerative disorders
<b>Judith L. Smith, Ph.D.</b>	Professor of Integrative Biology & Physiology; Vice Provost for Undergraduate Education, College of Letters and Science	Neural control of stereotypic limb motions
<b>Michael V. Sofroniew, M.D., Ph.D.</b>	Professor of Neurobiology	Astrocyte biology in health and disease

<b>Sophie Sokolow, Ph.D.</b>	Assistant Professor of Nursing	Alzheimer's disease
<b>Elizabeth R. Sowell, Ph.D.</b>	Associate Professor of Neurology	Developmental neuroimaging
<b>Igor Spigelman, Ph.D.</b>	Professor of Oral Biology & Medicine, School of Dentistry	Neurobiology of disease; mechanisms of chronic pain, seizures, stroke, brain trauma, and addiction
<b>Francis F. Steen, Ph.D.</b>	Associate Professor of Communication Studies/Speech	The nature of cognitive processes involved in interpersonal, computer-mediated, and mass communication
<b>Enrico Stefani, M.D., Ph.D.</b>	John Bartley Dillon Endowed Chair in Anesthesiology; Distinguished Professor of Anesthesiology and Physiology; Dorothy and Leonard Straus Scholar; Associate Director, Cardiovascular Research Laboratories	Stimulation emission depletion super-resolution microscopy, heart protection and mitochondria channels
<b>Catia Sternini, M.D.</b>	Professor of Medicine, and Neurobiology	Mechanisms that govern receptor-mediated responses in the enteric nervous system and chemosensing in the gastrointestinal tract
<b>Ronald Stevens, Ph.D.</b>	Professor of Microbiology, Immunology and Molecular Genetics; Director, IMMEX Project	EEG measures of workload and engagement to model the neurodynamic complexity of submarine piloting and navigation teams
<b>Rebecca A. Stockton, Ph.D.</b>	Assistant Professor of Pediatrics	Cerebrovascular disease, vascular medicine
<b>Hui Sun, Ph.D.</b>	Associate Professor of Physiology, and Ophthalmology; Early Career Scientist, Howard Hughes Medical Institute	A novel membrane transport system in physiology and mechanism of macular degeneration
<b>Yi E. Sun, Ph.D.</b>	Professor of Psychiatry and Biobehavioral Sciences, and Molecular and Medical Pharmacology	Epigenetic regulation of stem cells

<b>Yvette Taché, Ph.D.</b>	Professor of Medicine (Digestive Diseases); Director, Animal Core, CURE: Digestive Diseases Research Center; Co-Director, Center for Neurovisceral Sciences & Women's Health	Brain-gut interactions: Underlying mechanisms of stress influence on visceral pain with a focus on corticotrophin releasing factor signaling pathways; Gut alterations in Parkinson's disease models; Gut-brain peptides and regulation of food intake and gastric transit
<b>David B. Teplow, Ph.D.</b>	Professor of Neurology; Director, Biopolymer Laboratory	Biology and biochemistry of human neurodegenerative disorders
<b>Bruce Teter, Ph.D.</b>	Adjunct Associate Professor of Medicine	Alzheimer's disease with focus on genetics and metabolic effects; translational research developing drugs like fish oil/DHA and curcumin for both prevention and treatment
<b>James G. Tidball, Ph.D.</b>	Distinguished Professor of Integrative Biology and Physiology, and Pathology & Laboratory Medicine	Pathophysiology of muscular dystrophy
<b>Niranjala Tillakaratne, Ph.D.</b>	Researcher, Department of Integrative Biology & Physiology, and the Brain Research Institute	Identification of locomotor circuits following spinal cord injury
<b>Seema Tiwari-Woodruff, Ph.D.</b>	Associate Professor of Neurology	Aspects of demyelination-induced neurodegeneration and neuroprotection by various therapeutic interventions in mouse models of demyelination
<b>Ligia Toro, Ph.D.</b>	Professor and Dorothy and Leonard Straus Scholar of Anesthesiology, and Professor of Molecular and Medical Pharmacology	Smooth muscle and mitochondrial K-channels
<b>Nim Tottenham, Ph.D.</b>	Associate Professor of Psychology	Neurobiology of emotional development and the effects of early life stress on neuro-affective development
<b>Wallace W. Tourtellotte, M.D., Ph.D.</b>	Distinguished Professor of Neurology	Etiopathogenesis of multiple sclerosis
<b>Joshua T. Trachtenberg, Ph.D.</b>	Associate Professor of Neurobiology	Cortical learning, memory and plasticity



<b>Robert B. Trelease, Ph.D.</b>	Professor of Pathology and Laboratory Medicine; Associate Director, Instructional Design and Technology Unit, Dean's Office, David Geffen School of Medicine	Artificial intelligence, virtual reality, and anatomical informatics
<b>Cho-Lea Tso, Ph.D.</b>	Associate Professor of Surgery	Molecular/tumorigenic pathways and therapeutic targets of brain cancer stem cells
<b>Julio L. Vergara, Ph.D.</b>	Professor of Physiology	Skeletal muscle excitation-contraction coupling; synaptic transmission at the neuromuscular junction
<b>Eric Vilain, M.D., Ph.D.</b>	Professor of Human Genetics, Pediatrics, and Urology	Biology of sex differences and sexual development
<b>J. Pablo Villablanca, M.D.</b>	Associate Professor of Radiological Sciences; Chief, Neuroradiology	Diagnostic neuroradiology (stroke)
<b>Harry V. Vinters, M.D.</b>	Distinguished Professor of Pathology and Laboratory Medicine, and Neurology; Daljit S. & Elaine Sarkaria Chair in Diagnostic Medicine; Director, Neuropathology Laboratory	Cellular and molecular pathogenesis of human neurologic diseases
<b>Rhonda R. Voskuhl, M.D.</b>	Professor of Neurology; Director, Multiple Sclerosis Program; Chair, Jack H. Skirball Chair in MS Research	Multiple sclerosis
<b>Roi Ann Wallis, M.D.</b>	Associate Professor of Neurology; Associate Chief of Neurology, VA GLAHS	Mechanisms of neuronal injury from trauma and stroke
<b>Martin Wallner, Ph.D.</b>	Assistant Professor of Molecular & Medical Pharmacology	Pharmacology and physiology of extra synaptic GABA(A) receptors
<b>Danny Jiong Jiong Wang, Ph.D.</b>	Associate Professor of Neurology, and Radiology	Development and applications of functional and physiological MRI
<b>James A. Waschek, Ph.D.</b>	Professor of Psychiatry and Biobehavioral Sciences	Biological functions of neuropeptides, neuroimmunology, multiple sclerosis

<b>Kate M. Wassum, Ph.D.</b>	Assistant Professor of Psychology	Use and advance sophisticated behavioral paradigms, coupled with neuropharmacology and neurochemical monitoring techniques to elucidate the precise neural mechanisms and systems that underlie discrete aspects of motivated learning and decision-making
<b>Claude G. Wasterlain, M.D.</b>	Distinguished Professor of Neurology; Vice Chair Neurology, West Los Angeles VAMC	The basic science of epilepsy and status epilepticus
<b>Joseph B. Watson, Ph.D.</b>	Professor of Psychiatry and Biobehavioral Sciences; Associate Dean, Graduate Division, College of Letters and Science	Synaptic dysfunction in the neurodegenerative disorders Parkinson's disease and Huntington's disease
<b>Nancy L. Wayne, Ph.D.</b>	Professor of Physiology; Associate Vice Chancellor for Research	Neurophysiological control of reproduction
<b>Geraldine A. Weinmaster, Ph.D.</b>	Professor of Biological Chemistry	Defining the molecular mechanisms underlying Notch signaling in mammalian cells
<b>Stephanie A. White, Ph.D.</b>	Professor of Integrative Biology & Physiology; Vice-Chair, Interdepartmental Undergraduate Program for Neuroscience	Neural basis for socially learned vocal communication
<b>Julian P. Whitelegge, Ph.D.</b>	Adjunct Professor of Psychiatry and Biobehavioral Sciences	Neurodegeneration and biological mass spectrometry
<b>Peter C. Whybrow, M.D.</b>	Director, Semel Institute for Neuroscience and Human Behavior at UCLA; Judson Braun Distinguished Professor and the Executive Chair of the Department of Psychiatry and Biobehavioral Sciences, David Geffen School of Medicine at UCLA	Depression and manic-depressive disease and the effects of thyroid hormone on the brain and human behavior
<b>Martina Wiedau-Pazos, M.D., Ph.D.</b>	Associate Professor of Neurology	Motor neuron degeneration in amyotrophic lateral sclerosis (ALS)
<b>David S. Williams, Ph.D.</b>	Jules and Doris Stein Research to Prevent Blindness Professor of Ophthalmology; Professor of Neurobiology	Intracellular trafficking in photoreceptor and RPPE cells

<b>Roger P. Woods, M.D.</b>	Professor of Neurology, and Psychiatry and Biobehavioral Sciences	Structural and functional brain imaging
<b>Ernest M. Wright, D.Sc.</b>	Professor of Physiology, Mellinkoff Professor of Medicine	Membrane transport (SLC5 gene family)
<b>Allan D. Wu, M.D.</b>	Associate Professor of Neurology	Noninvasive transcranial neuromodulation, brain mapping, and plasticity in patients with movement disorders
<b>Benjamin M. Wu, D.D.S., Ph.D.</b>	Assistant Professor of Bioengineering	Biomaterials and tissue engineering
<b>Hong M. Wu, M.D., Ph.D.</b>	Professor of Molecular and Medical Pharmacology	Neuronal stem cells and tumorigenesis
<b>Cui-Wei (Tracy) Xie, M.D., Ph.D.</b>	Professor of Psychiatry and Biobehavioral Sciences	Synaptic plasticity, learning and memory
<b>Hong Yang, M.D., Ph.D.</b>	Research Physiologist, Department of Medicine (Digestive Diseases)	Brainstem mechanism of autonomic disorders in type 2 diabetes
<b>Xiangdong William Yang, M.D., Ph.D.</b>	Professor of Psychiatry and Biobehavioral Sciences	Pathogenesis of neurodegenerative diseases
<b>Xian-Jie Yang, Ph.D.</b>	Professor of Ophthalmology	Development and repair of the neural retina
<b>William H. Yong, M.D.</b>	Professor of Pathology and Laboratory Medicine	Pathology of brain tumors and biorepository science
<b>Alan Yuille, Ph.D.</b>	Professor of Statistics, and Psychology	Vision as Bayesian inference
<b>Dahlia Zaidel, Ph.D.</b>	Adjunct Professor of Psychology	Neuroscience of beauty in faces and art, and hemispheric specialization in memory for faces and objects
<b>Guido A. Zampighi, D.D.S., Ph.D.</b>	Professor of Neurobiology	Structure and function of chemical and electrical synapses
<b>Richard K. Zimmer, Ph.D.</b>	Professor of Ecology and Evolutionary Biology	Chemical communication and sensory ecology
<b>S. Lawrence Zipursky, Ph.D.</b>	Distinguished Professor of Biological Chemistry; Investigator, Howard Hughes Medical Institute	The molecular mechanisms underlying the formation of precise patterns of synaptic connections

### New Members

During the 2013-2014 academic year, eight new members joined the BRI:

Samantha J. Butler, Ph.D.	Assistant Professor of Neurobiology
Rachelle H. Crosbie-Watson, Ph.D.	Professor of Integrative Biology & Physiology, and Neurology
Benjamin M. Ellingson, Ph.D.	Assistant Professor of Radiological Sciences
Andrew J. Fuligni, Ph.D.	Professor of Psychiatry and Biobehavioral Sciences, and Psychology
Pamela J. Kennedy, Ph.D.	Assistant Professor of Psychology
Rajesh Kumar, Ph.D.	Assistant Professor of Anesthesiology, and Radiological Sciences
Gregory A. Miller, Ph.D.	Distinguished Professor and Chair of Psychology; Distinguished Professor of Psychiatry and Biobehavioral Sciences
Alapakkam P. Sampath, Ph.D.	Associate Professor of Ophthalmology

## Emeritus Members

A number of emeritus members continue to contribute to the field of neuroscience through their own research, and through the education and research training of our students and postdoctoral fellows.

Claude F. Baxter, Ph.D.	Emeritus Professor of Psychiatry and Biobehavioral Sciences
Jackson T. Beatty, Ph.D.	Emeritus Professor of Psychology
Donald P. Becker, M.D.	Emeritus Professor of Neurosurgery
Ruben J. Boado, Ph.D.	Emeritus Professor of Medicine (Endocrinology)
James R. Boulter, Ph.D.	Emeritus Professor of Psychiatry and Biobehavioral Sciences
Jennifer S. Buchwald, Ph.D.	Emeritus Professor of Physiology
Anthony T. Campagnoni, Ph.D.	Emeritus Professor of Neuroscience, Department of Psychiatry and Biobehavioral Sciences
Pasquale A. Cancilla, M.D.	Emeritus Professor of Pathology
Rochelle Caplan, M.D.	Emeritus Professor of Psychiatry and Biobehavioral Sciences
Carmine D. Clemente, Ph.D.	Emeritus Professor of Neurobiology
Robert C. Collins, M.D.	Emeritus Professor of Neurology
Donald D. Dirks, Ph.D.	Emeritus Professor of Surgery (Head and Neck)
Wilfrid J. Dixon, Ph.D.	Emeritus Professor of Biomathematics, Biostatistics, and Psychiatry and Biobehavioral Sciences
George Eisenman, M.D.	Emeritus Professor of Psychiatry and Biobehavioral Sciences
Earl Eldred, M.D.	Emeritus Professor of Neurobiology
M. David Fairchild, Ph.D.	Emeritus Professor of Molecular and Medical Pharmacology
Bernard K.K. Fung, Ph.D.	Emeritus Professor of Ophthalmology, and Molecular and Medical Pharmacology
Joaquin M. Fuster, M.D., Ph.D.	Emeritus Distinguished Professor of Cognitive Neuroscience, Department of Psychiatry and Biobehavioral Sciences
Richard A. Gatti, M.D.	Emeritus Distinguished Professor of Pathology and Laboratory Medicine, and Human Genetics
Roger A. Gorski, Ph.D.	Emeritus Distinguished Professor of Neurobiology
Vicente Honrubia, M.D., D.M.Sc.	Emeritus Professor of Surgery (Head and Neck)
Chester D. Hull, Ph.D.	Emeritus Professor of Psychiatry and Biobehavioral Sciences
Donald J. Jenden, B.Sc., M.B., B.S.	Emeritus Professor of Molecular and Medical Pharmacology
Margaret H. Jones, M.D.	Emeritus Professor of Pediatrics, Neurology, and Rehabilitation
Douglas Junge, Ph.D.	Emeritus Professor of Dentistry (Oral Biology and Medicine)
Franklin B. Krasne, Ph.D.	Emeritus Professor of Psychology
Sally Krasne, Ph.D.	Emeritus Professor of Physiology
Lawrence Kruger, Ph.D.	Emeritus Distinguished Professor of Neurobiology
Charles H. Markham, M.D.	Emeritus Professor of Neurology
James T. Marsh, Ph.D.	Emeritus Professor of Psychiatry and Biobehavioral Sciences
Michael T. McGuire, M.D.	Emeritus Professor of Psychiatry and Biobehavioral Sciences
Linda D. Nelson, Ph.D.	Emeritus Professor of Psychiatry and Biobehavioral Sciences
Elizabeth F. Neufeld, Ph.D.	Emeritus Professor of Biological Chemistry
Ernest P. Noble, M.D., Ph.D.	Emeritus Distinguished Professor of Psychiatry and Biobehavioral Sciences
Edward M. Ornitz, M.D.	Emeritus Professor of Psychiatry and Biobehavioral Sciences

William M. Pardridge, M.D. Kent M. Perryman, Ph.D.	Emeritus Distinguished Professor of Medicine (Endocrinology) Emeritus Research Physiologist, Department of Psychiatry and Biobehavioral Sciences
Michel Philippart, M.D.	Emeritus Professor of Neurology, Pediatrics, and Psychiatry and Biobehavioral Sciences
Robert W. Porter, M.D., Ph.D.	Emeritus Professor of Neurosurgery, University of California, Irvine
Robert W. Rand, M.D., Ph.D., J.D. Sidney Roberts, Ph.D. Eduardo H. Rubinstein, M.D., Ph.D. Arnold B. Scheibel, M.D.	Emeritus Professor of Neurosurgery Emeritus Professor of Biological Chemistry Emeritus Professor of Physiology, and Anesthesiology Emeritus Distinguished Professor of Neurobiology, and Psychiatry and Biobehavioral Sciences
John D. Schlag, M.D. Madeleine Schlag-Rey, Ph.D. José P. Segundo, M.D. Margret I. Sellers, Ph.D. Eustace A. Serafetinides, M.D., Ph.D. Margaret N. Shouse, Ph.D. Yvonne S. Slinger, Ph.D. Grant G. Slater, Ph.D.	Emeritus Distinguished Professor of Neurobiology Emeritus Research Neurobiologist Emeritus Professor of Neurobiology Emeritus Professor of Microbiology and Immunology Emeritus Professor of Psychiatry and Biobehavioral Sciences Emeritus Professor of Neurobiology Emeritus Professor of Surgery (Head & Neck) Emeritus Researcher, Department of Psychiatry and Biobehavioral Sciences, and School of Public Health
Ralph R. Sonnenschien, M.D., Ph.D. M. Barry Serman, Ph.D.	Emeritus Professor of Physiology Emeritus Professor of Neurobiology, and Psychiatry and Biobehavioral Sciences
Bradley R. Straatsma, M.D. Anna N. Taylor, Ph.D. James P. Thomas, Ph.D. Allan J. Tobin, Ph.D.	Emeritus Professor of Ophthalmology Emeritus Professor of Neurobiology Emeritus Professor of Psychology Emeritus Professor of Neurology, and Integrative Biology & Physiology
M. Anthony Verity, M.D. Jacques J. Vidal, Ph.D. Jaime R. Villablanca, M.D.	Emeritus Professor of Pathology (Neuropathology) Emeritus Professor of Computer Science Emeritus Distinguished Professor of Neurobiology, and Psychiatry and Biobehavioral Sciences
Jen Yu Wei, Ph.D. Bernice M. Wenzel, Ph.D. Charles L. Wilson, Ph.D. Charles D. Woody, M.D.	Emeritus Professor of Medicine Emeritus Professor of Physiology Emeritus Professor of Neurology Emeritus Professor of Psychiatry and Biobehavioral Sciences, and Neurobiology
Arthur Yuwiler, Ph.D. Eran Zaidel, Ph.D.	Emeritus Professor of Psychiatry and Biobehavioral Sciences Emeritus Professor of Psychology

### Corresponding Members

The national and international reputation of the Brain Research Institute attracts a number of prominent scientists as corresponding members in the Institute. These members include:

Filomena Bovet-Nitti, D.Sc.	Laboratorio di Psicobiologia e Psicofarmacologia, Consiglio Nazionale delle Ricerche, Rome, Italy
Anthony Kales, M.D.	Emeritus Professor, Department of Psychiatry, Pennsylvania State University, Hershey Medical Center
David F. Lindsley, Ph.D.	Associate Professor of Physiology, University of Southern California
Arnold J. Mandell, M.D.	Emeritus Professor of Psychiatry, University of California, San Diego
James L. McGaugh, Ph.D.	Professor of Psychobiology, University of California, Irvine
George P. Moore, Ph.D.	Professor of Biomedical Engineering and Physiology, University of Southern California
Eberhardt K. Sauerland, M.D.	Emeritus Professor of Anatomy, University of Texas, Medical Branch, Galveston
Marianne E. Schlaefke, M.D., Ph.D.	Institut für Physiologie, Ruhr-Universität, Bochum, West Germany
Oscar U. Scremin, M.D, Ph.D.	Professor of Physiology, VA Greater LA Healthcare





## INSTITUTE ACTIVITIES

### PROGRAMS AND CENTERS

In addition to the research funded by grants to individual members of the Institute, several collaborative centers and research programs are supported by endowments and grants administered by the Brain Research Institute. The following brief reports indicate the nature and accomplishments of each of these programs.

#### INTEGRATIVE CENTERS FOR NEUROSCIENCE EXCELLENCE (ICNE)

The launch of six new Integrative Centers for Neuroscience Excellence (ICNE) will bring different areas of research excellence into the forefront and highlight the specific strengths of UCLA's neuroscience activities. The UCLA neuroscience community is very large, and research is conducted within a number of schools, institutes, departments and organized research units (ORUs) which can make it difficult to envision how all the components contribute to the whole. The ICNE, by giving an institutional "face" to different areas of neuroscience, will remedy this situation by providing a focused profile highlighting the diverse activities of the neuroscience community to potential students and the public.

The proposed ICNE represent communities of scientists who share an interest in similar topics or techniques, and correspond roughly to the focused areas of research (FARs) that guide curriculum options for the Interdepartmental Ph.D. Program for Neuroscience. Each ICNE will develop its own identity. Each will have its own website, and receive endowment support to organize symposia and seminars, as well as facilitate coordination and cooperation in its particular field.

There are six Integrative Centers for Neuroscience Excellence. Two ICNE have launched (the Integrative Center for Learning and Memory, and the Integrative Center for Neurogenetics) and four are in the process of development. The next center to be launched will be the Integrative Center for Neural Repair and will represent research concentrations in neural development, degeneration and repair. Future ICNE will be concentrated on neuroimaging, synapses, cells and circuits, and addiction neurobiology.

The six Integrative Centers for Neuroscience Excellence include:

- Integrative Center for Learning & Memory (Launched March, 2012)
- Integrative Center for Neurogenetics (Launched, February, 2013)
- Integrative Center for Neural Repair (Launching, October 2014)
- Integrative Center for Addiction Research (planned)
- Integrative Center for Neuroimaging/Cognition (planned)
- Integrative Center for Synapses, Cells & Circuits (planned)

## LABORATORY OF NEUROENDOCRINOLOGY (Supported by NIH Grant-HD-07228)

The Laboratory of Neuroendocrinology (LNE) is a unit of the UCLA Brain Research Institute comprising 12 active faculty and two emeriti laboratories with a common interest in neuroendocrinology, sex differences, and reproduction. The LNE fosters education and collaborative research in neuroendocrinology and sex differences, especially in areas concerning reproduction. The activities of the LNE include graduate and undergraduate courses in neuroendocrinology, the weekly brown-bag seminar on current topics in neuroendocrinology, exchange of research ideas and methods among member laboratories, active research collaboration among labs, opportunities for students at all levels, and the annual Charles Sawyer lectureship in neuroendocrinology.

The educational activities of the LNE have been funded continuously since 1980 by an NIH T32 training grant, "Neuroendocrinology, Sex Differences, and Reproduction." Research of the faculty spans all analytical levels, from the molecular to the behavioral. Research interests include sex determination and sexual differentiation, hormonal regulation of neural function, sex differences in disease, cellular and molecular analysis of neural development, circadian rhythms, neural regulation of gonadal and adrenal function, glial neurobiology, stress, aging, neuroendocrine immunology, growth factors and cytokines, functional biology of the sex chromosomes, and genetic approaches. Although the main focus is on basic research in neuroendocrinology, faculty are also involved in direct analysis of human disease and clinical trials to develop new neuroendocrine therapies.

Annual research and training support awarded to the LNE faculty is more than \$16 million. Including faculty, postdoctoral scholars, graduate and undergraduate students, and staff, more than 70 individuals are associated with this laboratory.

The faculty of the Laboratory of Neuroendocrinology include Arthur P. Arnold (Integrative Biology & Physiology), Marie-Francoise Chesselet (Neurobiology and Neurology), Christopher S. Colwell (Psychiatry and Biobehavioral Sciences), Mansoureh Eghbali (Anesthesiology), Roger Gorski (Neurobiology, emeritus), Aldons (Jake) Lusic (Microbiology, Immunology and Molecular Genetics, and Human Genetics), Allan Mackenzie-Graham (Neurology), Paul E. Micevych (Neurobiology), Barney A. Schlinger (Integrative Biology & Physiology), Anna N. Taylor (Neurobiology, emerita), Eric Vilain (Human Genetics and Pediatrics), Rhonda Voskuhl (Neurology), Nancy L. Wayne (Physiology), and Stephanie S. White (Integrative Biology & Physiology).

Major research themes include gonadal steroid actions on the brain or other tissues (virtually all faculty); sex differences, sex determination, and sexual differentiation (all faculty); cellular and molecular analysis of development (Arnold, Chesselet, Micevych, Schlinger, Vilain, Wayne, White); endocrine regulation including ovulation and pregnancy (Eghbali, Micevych, Schlinger, Voskuhl, Wayne); neuroendocrine immunology (Mackenzie-Graham, Voskuhl); cellular physiology of hormone action (Eghbali, Micevych, Schlinger, Wayne); hormonal neuroprotection (Chesselet, Micevych, Schlinger, Voskuhl); comparative neuroendocrinology (Arnold, Schlinger, Wayne, White); genetics, gene networks, genetic models (Arnold, Chesselet, Lusic, Micevych, Vilain, Voskuhl); neurobiology of glia (Schlinger, Voskuhl); hormones, genes, gender, and behavior (Arnold, Lusic, Micevych, Schlinger, Vilain, Wayne, White), cardiovascular and metabolic disease and obesity (Arnold, Eghbali, Lusic), neuroimaging (Mackenzie-Graham).

## NEUROSCIENCE HISTORY ARCHIVES

The Neuroscience History Archives (NHA) continues to sponsor activities in four major areas: archival collection and consultation; teaching and advising; public outreach; and ongoing and future activities. We moved our base of operations this year from the UCLA Wilshire Center to CHS, facilitating closer ties with the Medical School and the Biomedical Library and we are creating a new website to showcase our several programs and initiatives.

### Archival Collection and Consultation

Our archival efforts under the expert guidance of NHA Archivist Russell Johnson, center on the identification and preservation of BRI and NPI researchers' papers and significant institutional records. In addition to maintaining our collaboration with national and international organizations, we have expanded our collaborations with local institutions. Reference activity in person and via email and letter post continued apace throughout the year, averaging one query (information requests, photographic or photocopy orders, research referrals, etc.) per day. The NHA also maintains and develops major internet resources: HISTNEUR-L (the History of Neuroscience Internet Forum and its online archives); and websites for the NHA (<http://www.NeuroscienceArchives.org>) and the International Society for the History of the Neurosciences (ISHN: <http://www.ishn.org>).

In November of 2013, we began a new project, helping the Society for Neuroscience to document and present its history and impact on the field of Neuroscience from its founding in 1969 to 1995. Our SfN Research Fellow, Dr. Rena Selya, is using oral histories and materials in SfN's own archives, as well as materials included in the NHA collections, to develop a historical essay which will be showcased on a multi-media website to be debuted at the next SfN Annual Meeting in November 2014. As part of the project, we scanned the entire run of the Neuroscience Newsletter, which will be featured on the website.

We completed processing of the Leo Rangell Papers, in time for the first Leo Rangell Endowed Lectureship, presented by Dr. Eric Kandel of Columbia University whom addressed a packed crowd at the Palisades Ballroom on November 14, 2013. This inaugural celebration of the Rangell Endowment, which honors Los Angeles psychoanalyst and UCLA Clinical Professor Leo Rangell, also introduced our History of Psychoanalysis website ([www.rangell.org](http://www.rangell.org)) which features exhibits from the NHA's. Rangell Papers, and a video produced by Dr. Joel Braslow, "Leo Rangell: A Life in Psychoanalysis," which used photos of several items in the Rangell Papers. The video is permanently viewable on the website.

We have continued to develop the NHA's archival website, "Transforming Tragedy," on the history of public mental health in California, (<http://histpub.semel.ucla.edu/DMH>). In 2013-14, we added several oral histories to the website, including an interview with Steven Mayberg, retired Director of the California Department of Mental Health, and created a new web page, highlighting The Painted Brain, an LA artistic collaboration of mental health consumers and advocates. Also, we are collaborating with Patton State Hospital to catalog and develop access to the collection of artifacts there.

### Teaching and Advising

In 2013-14, Dr. Joel Braslow, NHA Director, formally launched the Social Sciences Track in the Medical Student Training Program (MSTP), which will include a core interdisciplinary seminar for these new trainees and interested graduate students. We began a prototype biweekly seminar this year in collaboration with the Department of Sociology. Our first official MSTP student, Lauren Textor, will enter the program in the fall of 2014.

Our CTSI Translational Research Fellows, Erin Kelly, Howard Padwa, Sarah Starks and Andrew Subica are completing their two-year program. Dr. Padwa has accepted a research position at the West Los Angeles VA Medical Center and Dr. Subica at Loyola Marymount, while Dr. Kelly and Dr. Starks have received grant support to continue working with our program. We are using the History of Medicine endowment based in Neurobiology to continue Dr. Selya's fellowship on the history of neuroscience policy and funding and have recruited a new fellow, Rachel Elder from the University of Pennsylvania, who will be joining us in 2015. Dr.

Braslow continues to mentor the work of MSTP Fellow Arielle Lasky, and of history graduate students Alexander Kertzner, on post-polio disability and rehabilitation, and Christine Tarleton, on autism.

Dr. Braslow has continued his new seminar course for graduate students in the Interdepartmental Ph.D. Program for Neuroscience (NSIDP). This course reflects the NHA's emphasis on using history as a means to understand contemporary issues in the neurosciences. Dr. Braslow is developing a new seminar on the history of schizophrenia, which will also be the topic of his upcoming book.

Dr. Marcia Meldrum continued co-teaching an Interdisciplinary Cluster Course, "Mind Games: The History, Science, and Philosophy of the Brain," with colleagues from the Departments of Integrative Biology & Physiology, Philosophy and Psychology. The course has been highly successful and will be repeated with 160 incoming students in 2014-15. Dr. Meldrum invited students to three dinners at the Biomedical Library to view items from the NHA collection and talk about the history of neuroscience, and helped to arrange a spring field trip for interested students to Patton State Hospital. She also taught a spring seminar on the History of Psychology and will teach a History of Medicine class in the fall of 2014.

#### Public Outreach

The NHA continues to work actively to develop its collaboration with LACDMH, to provide data and analysis to assist the county in providing better services, as well as to gather material which will enrich the historical and archival record for future generations. We are collecting and integrating data from DMH and LACDHS on the utilization of county health services by low-income clients.

In collaboration with the Program for Medical History and the Medical Humanities, the NHA co-sponsors a monthly research forum, hosted in the Rare Book Room of the History and Special Collections Division for the Sciences of the Biomedical Library. Visiting speakers, UCLA faculty, graduate students, and local scholars are invited to present their work-in-progress and initial drafts of conference presentations. Speakers this year included Dr. Hannah Decker of the University of Texas on the history of the DSM-III, Carla Bittel of Loyola Marymount on gender and phrenology in 19th-century America, Soraya de Chadarevian on the early history of chromosomal genetics, and Rob Schraff on Sidney Cohen's research on LSD on 1950s-60s Los Angeles.

#### Grants and Contracts

Grants: Dr. Braslow and Dr. John Brekke of USC and their research team are continuing the analysis of data from their NIMH R01 (direct costs, \$ 2,045,877, plus an administrative supplement of \$255,655, through 2015) to study the impact of California's Mental Health Services Act on care in Los Angeles County. This project has involved the NHA in that the act is of major historical significance for the care of those with severe mental illness and the NHA will assist the county in documenting this major policy intervention.

Dr. Braslow and Dr. Brekke also served as co-PIs on a recently completed Robert Wood Johnson Independent Principal Investigator Award in Health Policy Research (direct costs-\$335,000). With this grant, we were able to use much of the rich archival material we have collected to examine contemporary mental health policy from a historical perspective.

Contracts: Since 2010, we have received more than \$700,000 in contracts with the Department of Mental Health to develop the "Transforming Tragedy" website and support the Translational Research Fellowships (described above). Our current projects include an evaluation of the Low Income Health Plan in Los Angeles County and of the implementation of Assisted Outpatient Treatment around the country.

The Neuroscience History Archives will continue to sponsor lectures and conferences that examine the historical, cultural, and sociological aspects of the neurosciences.

## RESEARCH EDUCATION

One of the principal goals recognized by the Brain Research Institute is the education of investigators for independent careers in research. Research aspirants at the undergraduate, predoctoral, and postdoctoral levels of development benefit from the same combination of departmental and interdisciplinary experience that characterizes the research activities of the Institute. A curriculum of courses is sponsored by the Institute that emphasizes interdisciplinary science education. These include both departmental courses approved for undergraduate life science majors and the Graduate Division for credit, and less formal seminars and lectures. All members of the Institute have major responsibilities as mentors of graduate students and postdoctoral fellows who are developing careers in neuroscience.

## UNDERGRADUATE EDUCATION

The undergraduate major in neuroscience is now in its nineteenth year. Officially established in the 1992-93 academic year after several years of planning and developing by the UCLA College Neuroscience Group, its majors now number approximately six hundred and fifty students.

The goal of the major is to provide an undergraduate introduction to the study of the nervous system at all levels of analysis. This concept is embodied in the core of the curriculum, the year-long series "Neuroscience: From Molecules to Mind." The courses in this series, as well as others in the major, emphasize critical thinking and analysis, and an introduction to laboratory research. Students are encouraged to complete an independent research project in a faculty member's laboratory and present their work in the annual Neuroscience Undergraduate Poster Session. The poster session was initiated in 1999, and this year 77 students presented posters and seven students were awarded prizes for their projects. Students also have the option to complete a Neuroscience Laboratory course, which provides hands-on experience with important methodology and experimental approaches in neuroscience.

This interdisciplinary major avails itself of the wealth of neuroscience resources at UCLA, and receives teaching contributions from Integrative Biology & Physiology, Psychology, and Molecular, Cell & Developmental Biology in the College of Letters and Science, and Biological Chemistry, Neurobiology, Neurology, Psychiatry and Biobehavioral Sciences, Medicine, and the Brain Research Institute in the School of Medicine. In total, over sixty faculty from the College of Letters and Science and the School of Medicine participate in the major. Their enthusiasm and generosity have been essential to the success of this program.

To date, there are 650 students enrolled in the program; 170 students earned their Bachelor of Science degree, and 10 students received a minor from the undergraduate neuroscience program in 2014; nearly 1960 Bachelor of Science degrees in neuroscience have been awarded since 1994.

## GRADUATE EDUCATION

A large number of Ph.D. candidates work in BRI laboratories by virtue of the fact that their departmental supervisors are members of the Institute. There were nearly 325 graduate students engaged in Institute activities during 2013-2014. Much of their educational activity is organized departmentally and all degrees are awarded by departments or interdepartmental programs. Generous interdepartmental experience is provided for most graduate students through preceptors' participation in collaborative research as well as by means of the broadly interdisciplinary seminars and lectures.

The following training programs utilize resources of the Brain Research Institute:

- (1) Interdepartmental Program leading to the Ph.D. in Neuroscience;
- (2) Program of instruction leading to both an M.D. and Ph.D. in Neuroscience.

#### Interdepartmental Program for Neuroscience

Organized Research Units (ORUs) themselves do not conduct graduate training within the University of California. The BRI has therefore undertaken to organize and foster the Interdepartmental Ph.D. Program for Neuroscience. This program, inaugurated in 1968, takes advantage of facilities and resources of the BRI as well as of ongoing educational activities sponsored by the Institute. The program provides for: (1) core instruction for all students in the anatomy, physiology, and chemistry of the nervous system; (2) instruction, in depth, for students with special interests in neuroanatomy, neurochemistry, neurophysiology, behavior, neurocybernetics and communication, neuroendocrinology, neuropharmacology, neuroimmunology, molecular neurobiology, neuropathology, neuroimaging, neurogenetics, neural repair, and neuroengineering; and (3) assistance and supervision in conducting dissertation research in all those fields. Trainees, in general, come from backgrounds in the life and biomedical sciences, but the program is sufficiently flexible to accommodate qualified students with other educational experiences and it is anticipated that increasing numbers of students will be attracted from physics, chemistry, mathematics, and engineering. During 2013-2014, 83 graduate students participated in the program, 16 of whom were new students selected from over 280 applicants. Since its inception, the Program has granted 323 degrees, of which 14 were awarded during the 2013-2014 academic year.

#### Program of Instruction Leading to Both the M.D. and Ph.D. Degrees in Neuroscience

This program was inaugurated in the fall quarter, 1968. It permits selected applicants to the School of Medicine to obtain both M.D. and Ph.D. degrees in a period of time substantially below that normally required. It combines the Interdepartmental Program for Neuroscience, described above, with the curriculum of the School of Medicine, revised to permit increased attention to student electives. It takes advantage of a decision of the University that permits students to register in more than one school concurrently. It is anticipated that instruction may be coordinated in such a way that a student may complete work leading to both degrees in as short a time as seven years. During 2013-2014, fourteen students participated in this program.

#### Training Programs Administered Through the Brain Research Institute

In addition to the training programs described above, four training grants were administered through the Brain Research Institute during the academic year 2013-2014:

- (1) Training Program in Cellular Neurobiology (P.I. Tom O'Dell, NIH grant NS 07101);
- (2) Training Program in Neural Repair (P.I. Marie Françoise Chesselet, NIH grant NS 07449);
- (3) Training Program in Neuroendocrinology, Sex Differences and Reproduction (P.I. Art Arnold, NIH grant HD 07228); and
- (4) UCLA Clinical Pharmacology Training Program (P.I. Barbara Levey, NIH T32 grant GM 75776).

### Training Program in Cellular Neurobiology

This program for predoctoral and postdoctoral trainees, directed by Dr. Tom O'Dell, seeks to expose students to the fundamental problems in neurobiology and then to give them an intensive interdisciplinary training in modern research techniques. Research interests of the training supervisors include membrane biophysics, cellular electrophysiology, molecular neurobiology, developmental neurobiology, intercellular interactions, sensory physiology, and central nervous processing. The program is designed to be flexible, exposing trainees to many different aspects of neurobiology while providing maximal opportunity to pursue a particular research interest. A thorough curriculum of basic science and introductory and specialized neurobiology courses is available, as are specialized lecture and technique courses in a wide variety of related disciplines. Four postdoctoral trainees participated in this program in 2013-2014.

### Training Program in Neural Repair

This program for predoctoral and postdoctoral trainees, directed by Dr. Marie-Françoise Chesselet, draws on the unique strength of a group of training faculty at UCLA to train young investigators in the basic aspects of neural repair. Recent years have seen tremendous progress in the understanding of the mechanisms of neuronal death and neural plasticity, leading to new perspectives for neural repair in the central nervous system. This program trains investigators to meet the challenges of the field in the next century. The program enrolls postdoctoral fellows and outstanding graduate students from the Interdepartmental Graduate Program for Neuroscience and other graduate programs at UCLA. The curriculum for predoctoral trainees in the Interdepartmental Graduate Program for Neuroscience includes training in broad areas of cellular, molecular and system neuroscience, specialized courses in neural repair, and exposure to relevant clinical situations. Students with a primary interest in neural repair are selected for support at the end of the second quarter of their first year in the program. Students are exposed to interactions with a variety of faculty and students investigating the nervous system from many perspectives, both basic and clinical. These interactions occur in courses, seminars, and activities organized by postdoctoral fellows or students, and the annual neuroscience student retreat. During the 2013-2014 academic year, one postdoctoral trainee participated in this program.

### Training Program in Neuroendocrinology, Sex Differences and Reproduction

The objectives of this program, directed by Dr. Arthur Arnold, are to foster the training of predoctoral and postdoctoral investigators in the didactic components of, and research approaches to, the neuroendocrine regulation of reproduction. Research training available spans the discipline and includes neuroanatomical, neurochemical, physiological, molecular, and behavioral approaches. Educational goals are met through a formal course that includes background material, general lectures and research seminars given by both students and faculty, a weekly journal club, and frequent meetings of individual laboratory groups. During 2013-2014, five predoctoral and two postdoctoral trainees participated in this program.

### UCLA Interdepartmental Clinical Pharmacology Training Program

The UCLA Interdepartmental Clinical Pharmacology Training Program (ICPTP) is a thriving, highly structured mentored clinical scholar program in patient-oriented research that is broad, interdisciplinary and focused on the area of clinical pharmacology and experimental therapeutics. This field bridges molecular medicine and health care and covers all areas of clinical medicine. The renewed T32 Clinical Pharmacology Training Program grant from the National Institute of General Medical Sciences (NIGMS) provides each participant with salary support and career development for a minimum of two years. During 2013-2014, four postdoctoral trainees were supported by the T32 training grant. Concurrent with the ICPTP is the K30

Training Program, which is now part of the UCLA Clinical Translation Science Award held by the David Geffen School of Medicine, which offers a curriculum in translational investigation, principally designed for residents and clinical faculty interested in research.



## Ph.D. Degrees Awarded

During the 2013-2014 academic year, 15 students completed their doctoral studies and filed their dissertation. Students receiving their degrees, their mentors, and the titles of their dissertations include:

Scott Arno

Mentor: Istvan Mody

“Genetic and Pharmacological Manipulations of Parvalbumin Interneurons: Relevance to Neuropsychiatric Disease”

James Ashenhurst

Mentors: Lara Ray and David Jentsch

“Translational Examination of Risk-Related Decision-Making as an Endophenotype for Alcohol Use Disorders”

Aida Attar

Mentor: Gal Bitan

“In Vivo Characterization of CLR01, an Aggregation and Toxicity Inhibitor, with an Alzheimer's Disease Focus”

Amy Baohan

Mentor: Joshua Trachtenberg

“PTEN and the Emergence of Cortical Perisomatic Inhibition”

Jamee Berg

Mentor: Dan Geschwind

“Elucidation of the Developmental Role of Janus Kinase and Microtubule-Interacting Protein 1, JAKMIP1, an Autism Candidate Gene”

Jaehoon Choe

Mentor: Reggie Edgerton

“Spinal Cord Neuronal Circuit Dynamism during Sensorimotor Control”

Cortney Crego

Mentor: Alcino Silva

“TrkB Signaling: Beyond the Traditional Model”

Emily Dennis

Mentor: Paul Thompson

“Developmental, Genetic, and Cognitive Correlates of Structural Brain Connectivity”

Victoria Ho

Mentor: Kelsey Martin

“Post-Transcriptional Mechanisms of Gene Regulation in Mature Neurons”

Milky Kohno

Mentor: Edythe London

“Modulators of Maladaptive Decision-Making in Methamphetamine Dependence: A Multimodal Neuroimaging Approach”

Thuc Le

Mentors: Kym Faull and Guoping Fan

“Regulation of DNA Methylation and Hydroxymethylation in Postmitotic Neurons and Other Mammalian Cells”

Sarah Madsen

Mentor: Paul Thompson

“MRI Biomarkers and Modifiable Health Factors of Aging and Dementia”

Angie Morales

Mentor: Edythe London

“Gray-Matter Volume in Methamphetamine Dependence: Sources of Variability and Behavioral Relevance”

Chris Park

Mentor; William Yang

“Striatal Indirect Pathway Dysfunction in a CNS-Specific Zfp521-Deficient Mouse Model of Tourette Syndrome-Like Behaviors”

Salvatore Torrisi

Mentor: Lori Altshuler

“Functional Brain Connectivity During Emotion Regulation and Applications to Bipolar Disorder”

2013-2014 Graduate and Undergraduate Interdepartmental Neuroscience Programs Committee Service

Graduate Neuroscience Interdepartmental Program Committee

Dean Buonomano  
S. Thomas Carmichael  
Ellen Carpenter  
Marie-Françoise Chesselet  
Christopher Evans  
David Glanzman  
Cameron Gundersen  
Ming Guo  
Karen Gylys  
Frank Krasne  
Michael Levine, Chair  
Kelsey Martin  
Tom O'Dell  
Thomas Otis  
Alvaro Sagasti  
Melissa Sherlock (NSIDP Student Affairs Officer)  
Martina De Salvo (Student Representative, year 2)  
Esther Nie (Student Representative, year 1)

Graduate Neuroscience Interdepartmental Program Neuroadmissions Committee

Liana Apostolova  
Adriana Galván  
Daniel Lu  
Sotiris Masmanidis  
Tom O'Dell, Chair  
Kate Wassum  
David Williams  
Ryan Jones (NSIDP Student Representative)  
Esther Nie (NSIDP Student Representative)

Graduate Neuroscience Interdepartmental Program Curriculum Committee

Carrie Bearden  
Susan Bookheimer  
Ben Novitch  
Felix Schweizer, Chair  
Nick Hardy (Student Representative)

Graduate Neuroscience Interdepartmental Program Advising Committee

Susan Bookheimer  
David Hovda  
David Krantz, Chair  
Sotiris Masmanidis

Graduate Neuroscience Interdepartmental Program Executive Committee

Chris Evans  
David Krantz  
Michael Levine, Chair  
Tom O'Dell  
Felix Schweizer

Graduate Neuroscience Interdepartmental Program Membership Committee

Marie-Françoise Chesselet  
Michael Levine, Chair  
Nigel Maidment

Graduate Neuroscience Interdepartmental Program Recruitment Committee

Student Committee

Martina DeSalvo  
Ryan Guglietta  
Sarah Hersman  
Rachel Jonas  
Jia Liu  
Jason Moore

Faculty Committee

Samantha Butler  
Mark Frye  
Ben Novitch, Chair  
Stephanie White  
Chris Ching (Student Representative)  
Rachel Jonas (Student Representative)

Graduate Neuroscience Interdepartmental Written Qualifying Exam Committee

Ellen Carpenter (Molecular, year 1)  
Sandra Loo (Systems, year 2)  
Carlos Portera-Cailliau (Cellular, year 2)

Graduate Neuroscience Interdepartmental Program Student Retreat Committee

Hua Chai  
Martina De Salvo  
David DiTullio  
Maria Lazaro  
Leo Moore

Undergraduate Neuroscience Interdepartmental Program Executive Committee

Ellen Carpenter, Chair  
Scott Chandler  
David Glanzman  
Carlos Grijalva  
Patricia Phelps  
Joseph Watson  
Stephanie White

Undergraduate Neuroscience Interdepartmental Program Curriculum Committee

Scott Chandler  
Ellen Carpenter, Chair  
Chris Colwell  
J. David Jentsch  
Thomas O'Dell  
Stephanie White



**INTERDEPARTMENTAL Ph.D. PROGRAM FOR NEUROSCIENCE  
GRADUATE STUDENTS**

<u>Trainee</u>	<u>Sponsor</u>	<u>Department</u>
Caitlin Aamodt	Krantz	Neuroscience
Daya Alexander	Prins, M.	Neuroscience
Matt Anderson	Krantz	Neuroscience
Madeline Andrews	Novitch/Butler	Neuroscience
Joseph Antonios	Liau	Neuroscience/MSTP
Jacob Aptekar	Frye	Neuroscience/MSTP
Scott Arno	Mody	Neuroscience
Erica Arroyo	Portera-Cailliau	Neuroscience
James Ashenhurst	Jentsch	Neuroscience
Aida Attar	Bitan	Neuroscience
Kosstya Bakhurin	Masmanidis	Neuroscience
Amy Baohan	Trachtenberg	Neuroscience/MSTP
Jamee Bomar (Berg)	Geschwind	Neuroscience
Shivan Bonanno	Martin	Neuroscience
Andrew Brumm	Carmichael	Neuroscience
Jeffrey Cantle	Yang, X. William	Neuroscience
Daniel Cantu	Portera-Cailliau	Neuroscience
Patrick Chen	Martin	Neuroscience
Hua Chai	Khakh	Neuroscience/MSTP
Chris Ching	Thompson	Neuroscience
Jaehoon Choe	Edgerton	Neuroscience
Leo Christov-Moore	Bookheimer	Neuroscience
Cortney Crego	Silva	Neuroscience
Anthony Daggett	Yang, X. W.	Neuroscience/MSTP
Emily Dennis	Thompson	Neuroscience

<u>Trainee</u>	<u>Sponsor</u>	<u>Department</u>
Martina DeSalvo	Martin	Neuroscience
David DiTullio	Carmichael	Neuroscience/MSTP
Micky Einstein	Golshani	Neuroscience
Katherine Fehlhaber	Sampath	Neuroscience
Adam Frank	Silva	Neuroscience/MSTP
Joel Frohlich	Jeste	Neuroscience
Allison Furterer	Krantz	Neuroscience
Matt Garrett	Kornblum	Neuroscience
Ryan Guglietta	O'Dell	Neuroscience
Yoon (Albert) Han	Novitch	Neuroscience/MSTP
Nick Hardy	Buonomano	Neuroscience
Tessa Harrison	Bookheimer	Neuroscience
Roni Hazim	Williams	Neuroscience
Cynthia He	Portera- Cailliau	Neuroscience/MSTP
Leanna Hernandez	Dapretto	Neuroscience
Sarah Hersman	Fanselow	Neuroscience
Jon Heston	White	Neuroscience
David Ho	Mehta	Neuroscience
Victoria Ho	Martin	Neuroscience/MSTP
Andrew Howe	Krantz	Neuroscience
Ruyi Huang	Lu	Neuroscience
Shan Huang	Silva	Neuroscience
Rachel Jonas	Bearden	Neuroscience
Don Julien	Sagasti	Neuroscience
Ashley Kees	Mehta	Neuroscience
Milky Kohno	London	Neuroscience
Jennifer Kong	Novitch	Neuroscience



<u>Trainee</u>	<u>Sponsor</u>	<u>Department</u>
Katherine Lawrence	Krantz	Neuroscience
Maria Lazaro	Geschwind	Neuroscience
Thuc Le	Fan/Faull	Neuroscience
Wei Li	Feusner	Neuroscience
Janelle Liu	Krantz	Neuroscience
Jia Liu	Otis	Neuroscience
Sarah Madsen	Thompson	Neuroscience
Laurel Martin-Harris	Bookheimer	Neuroscience
Whitney McDonald	Harris	Neuroscience
Kevin McEvoy	Jeste	Neuroscience/MSTP
Jason Moore	Mehta	Neuroscience
Lisa Moore	Lu	Neuroscience
Angelica Morales	London	Neuroscience
Katherine Myers	Schweizer	Neuroscience
Daniel Nachun	Krantz	Neuroscience
Esther Nie	Carmichael	Neuroscience/MSTP
Andrew O'Keeffe	Pouratian	Neuroscience
Anna Parievsky	Levine	Neuroscience
Neelroop Parikshak	Geschwind	Neuroscience/MSTP
Chang Sin (Chris) Park	Yang, X.W.	Neuroscience
Alex Reeves	Otis	Neuroscience
Sophie Rengarajan	Hallem	Neuroscience/MSTP
Matthew Schreiner	Bearden	Neuroscience
Andrew Segal	Giza	Neuroscience
Wes Smith	Masmanidis	Neuroscience
Elliot Swartz	Coppola	Neuroscience
Andrew Thompson	Andrews	Neuroscience

<u>Trainee</u>	<u>Sponsor</u>	<u>Department</u>
Salvatore Torrisi	Altshuler	Neuroscience
Jennifer Tribble	Krantz	Neuroscience
Supraja Varadarajan	Novitch/Butler	Neuroscience
Donald Vaughn	Krantz	Neuroscience
Derek Verley	Harris	Neuroscience
Donna Marie Werling	Geschwind	Neuroscience
Shayna Williams	Arnold	Neuroscience
Courtney Yaeger	Krantz	Neuroscience
Alice Zhang	Geschwind	Neuroscience/MSTP

Sources of support include:

ARCS Foundation

Dean's Office Stipend, College of Letters and Science

Dean's Office Stipend, School of Medicine

Graduate Division Fellowship Program

National Institute of Mental Health Individual Research Fellowship Award

National Science Foundation Individual Fellowships

Frances Keddie O'Malley Endowment Fund

Training Program in Neuroendocrinology, Sex Differences and Reproduction

Training Program in Neural Repair

## **POSTDOCTORAL EDUCATION**

Postdoctoral research instruction is another major activity of the BRI, and over 300 participants who hold the Ph.D., M.D., D.D.S. or D.V.M. degree, or the equivalent of one of these degrees, occupied Institute members' laboratories during 2013-2014. Four of them were part of a Training Program in Cellular Neurobiology awarded to Dr. Tom O'Dell, one was sponsored by the Training Program in Neural Repair awarded to Dr. Marie-Françoise Chesselet, two were sponsored by the Training Program in Neuroendocrinology, Sex Differences and Reproduction headed by Dr. Arthur Arnold, and four were sponsored by the UCLA Clinical Pharmacology Training Programs awarded to Barbara Levey. Much of the experience offered these fellows and trainees is preceptorial, although most participate in interdisciplinary courses and seminars as well.

## **EXTRAMURAL AND FOREIGN ASSOCIATIONS**

The Brain Research Institute has always endeavored to provide its members with the opportunity to exchange information with colleagues from other institutions, here and abroad. Early in the history of the Institute, extramural research associations were established to conduct collaborative research in laboratories of the regional Veterans Administration Medical Centers in Long Beach, Brentwood, Sepulveda, and West Los Angeles. These associations have been particularly gratifying and productive for BRI members. In addition, scientific communication has been enhanced by inviting scientists to visit BRI laboratories and by holding conferences.

## **VISITING SCIENTISTS**

As in past years, the BRI has been able to offer space to a large number of mature and distinguished investigators from UCLA and elsewhere that have conducted independent research activities at the Institute or joined programs already established at the BRI. Some of these investigators, particularly those from foreign countries, returned to their home laboratories after completing research in Institute programs. Others remained as associates of BRI members for prolonged periods, or even permanently as resident investigators.

Historically, the BRI hosts nearly 100 scientists with whom Institute members have enjoyed extended periods of association during the academic year.



## BRAIN RESEARCH INSTITUTE ADMINISTRATION

The Brain Research Institute operates under a director and three associate directors, one for research, one for education and training, and one for science outreach. Smooth and efficient operation of the Brain Research Institute depends to a very large extent on the guidance provided by its associate directors, program and administrative directors, committees, and participation of individual members. The BRI members who serve in these capacities give freely of their time, and their services are greatly appreciated.

During 2013-2014 the following people played a central role in the administrative activities of the Brain Research Institute:

### **Administration:**

Christopher J. Evans, Director  
J. David Jentsch, Associate Director for Research  
Michael S. Levine, Associate Director for Education  
Ellen M. Carpenter, Associate Director for Science Outreach  
Terry Novorr: Chief Administrative Officer

Director's administrative staff consisted of six full-time positions, and five part-time positions:

### Personnel

Steve Antonie	Student Affairs Officer, Undergraduate Neuroscience IDP
Vaishnavi Govind	Clerk
Debra Kozel	Administrative Specialist
Patricia Lowe	Chief Financial Officer
Linda Maninger	Senior Administrative Analyst
Huy Pham	Programmer Analyst
Marissa Ray	Student Affairs Officer, Graduate Neuroscience IDP
Polly Segal	Administrative Analyst
Alys Shanti	Principal Writer/Editor
Melissa Sherlock	Student Affairs Officer, Graduate Neuroscience IDP
Eddie Songtanin	Programmer Analyst

### **Committee Service**

#### BRI Executive Committee

Scott Chandler (*ex officio*: Chair, Undergraduate Interdepartmental Neuroscience Program)  
Reggie Edgerton  
Christopher Evans (*ex officio*: BRI Director)  
Joaquin Fuster  
Michael Levine (*ex officio*: BRI Associate Director for Education; Chair, Graduate Interdepartmental Neuroscience Program)  
Terry Novorr (*ex officio*; BRI Chief Administrative Officer)  
Felix Schweizer  
Rhonda Voskuhl  
Peter Whybrow  
Larry Zipursky

BRI Faculty Advisory Committee

J. David Jentsch (*ex officio*; BRI Associate Director for Research)  
Joel Braslow  
Scott Chandler (*ex officio*: Chair, Undergraduate Interdepartmental Neuroscience Program)  
Marie-Françoise Chesselet, Chair  
Michael Fanselow  
Debra Farber  
Daniel Geschwind  
David Glanzman  
Michael Levine (*ex officio*; BRI Associate Director for Education; Chair, Graduate Interdepartmental Program for Neuroscience)  
Peter Whybrow

25<sup>th</sup> Annual Magoun Lecture Committee

V. Reggie Edgerton  
Michael Fanselow  
Daniel Geschwind  
Ronald Harper  
David Jentsch, Chair  
Kelsey Martin

Eiduson and Kavan Student Awards Committee

Ellen Carpenter  
Michael Levine, Chair  
Felix Schweizer

Brain Research Institute Predoctoral and Postdoctoral Awards Committee

Giovanni Coppola  
Alicia Izquierdo  
J. David Jentsch, Chair  
Jesse Rissman  
Alvaro Sagasti  
Kate Wassum  
Stephanie White

Joint Seminars in Neuroscience Committee

Anne Andrews	David Krantz
Carrie Bearden	Tom Otis
Tad Blair	Carlos Portera-Cailliau
Dean Buonomano	Alvaro Sagasti
J. David Jentsch	Felix Schweizer
Baljit Khakh, Chair	Stephanie White

Neuroscience Training Grant Committee

Arthur Arnold  
Marie-Françoise Chesselet  
Mark Cohen  
Jack Feldman  
Nelson Freimer  
Daniel Geschwind  
Michael Levine, Chair  
Edythe London  
Thomas O'Dell  
Dwayne Simmons

"Friends of BRI" Committee

Carmine Clemente	Michael Levine
Christopher Evans	Arnold Scheibel
Alan Han	Joseph Watson
J. David Jentsch	Abe Zarem

**Training Grant Directors**

Training Grant

Cellular Neurobiology (T32)

Clinical Pharmacology Training  
Program (T32)

Neural Repair (T32)

Neuroendocrinology, Sex Differences, and  
Reproduction (T32)

Faculty Coordinator

Tom O'Dell

Barbara Levey

Marie-Françoise Chesselet

Arthur P. Arnold

### **Integrative Centers for Neuroscience Excellence (ICNE)**

The launch of six new Integrative Centers for Neuroscience Excellence (ICNE) will bring different areas of research excellence into the forefront and highlight the specific strengths of UCLA's neuroscience activities.

<u>Integrative Center for Neuroscience Excellence</u>	<u>Faculty Leader(s)</u>
Integrative Center for Learning & Memory (Launched March, 2012)	Alcino Silva, Michael Fanselow and David Glanzman
Integrative Center for Neurogenetics (Launched, February, 2013)	Nelson Freimer and Daniel Geschwind
Integrative Center for Neural Repair (Launching, October 2014)	Marie Françoise Chesselet and Tom Carmichael
Integrative Center for Addiction Research (Planned)	Edythe London
Integrative Center for Neuroimaging/Cognition (Planned)	Susan Bookheimer
Integrative Center for Synapses, Cells & Circuits (Planned)	Jack Feldman

### **Interdisciplinary Affinity Groups include: (\*upcoming ICNE)**

<u>Affinity Group</u>	<u>Leader(s)</u>
Addictions Research Consortium*	Edythe London & Igor Spigelman
Astrocyte Biology	Baljit Khakh & Michael Sofroniew
Autism	Daniel Geschwind
Brain-Mind-Body Interactions	Michael Irwin
Brain Tumor	Linda Liau and Robert Prins
Circadian and Sleep Medicine	Christopher Colwell
Computational Neuroscience	Ladan Shams
Immunology in Neuroscience	James Waschek
Inner Ear	Felix Schweizer
Neural Repair*	Marie-Françoise Chesselet
Neural Stem Cells	Harley Kornblum
Neurobiology of <i>Drosophila melanogaster</i> and <i>C. Elegans</i>	David Krantz
Neuroendocrinology	Arthur Arnold
Neuroimaging/Cognition*	Susan Bookheimer
Neuronuclear Imaging Affinity Group	Daniel Silverman
Neurophysics & Neuroengineering	Mayank Mehta
Neuroscience History	Joel Braslow & Russell Johnson
Songbird	Stephanie White
Stress, Pain and Emotion	Emeran Mayer
Synapse to Circuit Club*	Kelsey Martin & Larry Zipursky
Undergraduate Researchers in Parkinson's Disease	Marie-Françoise Chesselet
Zebra Fish	Alvaro Sagasti



## UCLA BRAIN RESEARCH INSTITUTE CORE FACILITIES

The UCLA Brain Research Institute Imaging Core Facilities provide microscopic imaging and specimen preparation services for Institute members and other members of the biomedical community at UCLA. The Imaging Core consists of three components: the Carol Moss Spivak Cell Imaging Facility (primarily confocal and multiphoton microscopy), the Microscopic Techniques laboratory (for preparation of all types of specimens for light microscopy), and the Electron Microscopy Laboratory (for preparation and imaging of ultrastructural specimens by transmission electron microscopy). Another core facility, the Pasarow Mass Spectrometry Laboratory, is also associated with the Brain Research Institute.

### **The Carol Moss Spivak Cell Imaging Facility**

The Carol Moss Spivak Cell Imaging Facility, the Institute's microscope laboratory, moved to the California Nanosystems Institute (CNSI) in 2008 and joined with another imaging facility from the Department of Chemistry to form the CNSI Advanced Light Microscopy/Spectroscopy Facility, located in Rooms B145 and 2144 of the CNSI. The new facility has five point scanning confocal microscopes: two Leica TCS-SP MP Confocal and 2-Photon Microscopes one inverted and one upright fixed-stage, two Leica TCS-SP2 AOBS confocal microscopes, one with multiphoton capability and finally a Leica TCS-SP5 STED confocal-multiphoton microscope. The latter is a STimulated Emission Depletion laser-scanning superresolution microscope which allows fluorescence scanning below the limit of light resolution (60-90 nm as opposed to 200-300nm). The Facility also has a widefield fluorescence microscope dedicated to FISH (fluorescence in situ hybridization) imaging, and a home-built system for ALEX (alternating laser excitation spectroscopy). Another lab in the facility is more dedicated to macroscale imaging and has one upright and one inverted microscopes set up for microinjection as well as fluorescence widefield timelapse (inverted) and multispectral unmixing (upright). The Facility also has a Yokogawa laser-scanning spinning disk microscope system with a Leica DMI6000 inverted microscope and an Andor EMCCD camera as well as two small animal imaging systems, a Maestro (CRi) for multispectral fluorescence unmixing and an Optix (ART) for lifetime imaging by time domain. The Facility has a Leica LMD7000 laser microdissection system with a new 64 bit computer and advanced software. This system is used for isolation of cells from within tissues for downstream processing and analysis. The Facility also will have a Nikon TIRF (total internal reflection) microscope in the future. Technologies available include fluorescence point-scanning and spinning disk laser-scanning confocal microscopy, fluorescence lifetime imaging (FLIM), fluorescence resonance energy transfer (FRET), fluorescence correlation spectroscopy (FCS), alternating laser excitation spectroscopy (ALEX), microscopic multispectral fluorescence and widefield color unmixing, microinjection and most recently, laser microdissection. Drs. Laurent Bentolila and Matt Schibler (originally in charge of the facility in the Gonda Center) are responsible for training, operation and upkeep of the facility.

### **Microscopic Techniques Laboratory**

The Microscopic Techniques Laboratory, located in room 78-177 CHS, is directed by Marianne Cilluffo. This facility provides equipment for general histology for frozen, paraffin, vibratome and plastic sectioning. The facility also provides instruction and service in preparing tissue specimens for all aspects of light microscopic observation. Staining methods available include immunohistochemistry (immunofluorescence, immunoperoxidase and other enzyme-immune complex techniques), routine histological stains: (e.g., Nissl and hematoxylin/eosin), special stains (e.g., Kluver and iron reaction, Trichrome stains) and in situ hybridization. Procedures offered are paraffin sectioning, slide preparation for in situ hybridization, frozen sectioning and semi-thin plastic sectioning. The laboratory also provides staining setups and a Nikon photomicroscope and digital imaging system for use by trained personnel. The facility also houses an Applied Biosystems 7900HT Sequence Detection System. This system is a second-generation sequence detection system instrument

designed for automated, high-throughput detection of fluorescent PCR-related chemistries. The instrument is capable of real-time, end-point, and dissociation curve analysis of assays arrayed on multiple formats.

### **Electron Microscopy Services Center**

The Electron Microscopy Services Center, located in room 63-377 CHS, is run by Marianne Cilluffo. This facility houses a JEOL 100CX transmission electron microscope, Reichert Ultracut and RMC MT-X ultramicrotomes. Balzers vacuum evaporator is also available for use by trained personnel. This facility provides service and training in fixation and embedding of specimens, thin sectioning, and use of the electron microscopes (with or without assistance), negative stain, and examination and interpretation at the EM level. The facility offers advice on appropriate preparatory procedures and other technical matters, including EM immunohistochemistry. Training and assistance in the use of the electron microscope are also offered.

### **Pasarow Mass Spectrometry Laboratory**

The Pasarow Mass Spectrometry Laboratory (PMSL) performs teaching and research functions for the entire UCLA community and beyond by making available a range of mass spectrometric and chromatographic equipment and expertise. Virtually no week passes without a new contact made with one or another UCLA research group who seek access to the expertise and facilities of the PMSL. Some of these interactions are short-lived and involve analysis of only a few samples. Some of these contacts develop into long-term research collaborations with important teaching components and eventually result in joint grant applications. Often the visiting group initially seeks to collect pilot data to support a forthcoming grant application. Many of these collaborations result in joint publications, and the publication records of both the director, co-director and staff members reflect this wide diversity of research exposure.

The mass spectrometric equipment currently available in the PMSL includes: an Agilent 6540 hybrid quadrupole-TOF mass spectrometer with an Agilent 1290 Affinity UHPLC system and an Agilent 1260 Infinity nanoLC/Chip Cube system; a Waters (Micromass) combined gas chromatograph-TOF mass spectrometer (GCT); three Agilent 6460 triple quadrupole mass spectrometers, one equipped with an Agilent 1290 Affinity UHPLC system and the other attached to an Agilent 1200 nanoLC with a Chip Cube system; a Sciex API III+ triple quadrupole electrospray mass spectrometer with a dedicated ABI HPLC; a Finnigan LTQ linear ion trap electrospray mass spectrometer with HPLC and software for multidimensional protein identification technology experiments (currently located in the laboratory of Dr. Nigel Maidment). In addition, through the Molecular Instrumentation Center, an IonSpec Ultima Fourier Transform mass spectrometer with a 7 Tesla magnet and ESI and LD sources, and a combined gas chromatograph-TOF (Micromass/Waters GCT) equipped with EI/CI and positive/negative ion capability, are also available. The available stand-alone HPLC equipment includes two computer controlled HP 1090 Chemstations.

The laboratory is directed by Professor Dr. Kym Faull and co-directed by Adjunct Professor Dr. Julian Whitelegge.

### **Animal Facilities**

The BRI moved its facilities from the Center for the Health Sciences to the Gonda (Goldschmied) Neuroscience and Genetics Research Center in 1998.

### **Administrative Support Services**

This service provides preparation of proposals and progress reports; budget consultation and preparation; student advising services; grant and/or resource administration, such as accounting, purchasing, personnel management, receiving and delivery of supplies; symposium, seminar, and event coordination, publications management; editorial assistance; and clerical support.

## INSTRUCTIONAL ACTIVITY

### JOINT SEMINARS IN NEUROSCIENCE

The Joint Seminars in Neuroscience series was initiated Fall, 1995. It is organized and coordinated by the BRI, and is sponsored by the Brain Research Institute, the Semel Institute for Neuroscience & Human Behavior, and the David Geffen School of Medicine at UCLA. The participation of numerous departments and ORUs campus-wide reflects the truly interdisciplinary nature of neuroscience at UCLA. This weekly seminar series brings scientists of national and international repute to UCLA to meet with faculty, postdoctoral fellows, and students, and to present a lecture to the neuroscience community. Below is a list of this year's speakers and the title of their presentations.

#### Fall 2013

**Stephen M. Smith, Ph.D.**, Division of Pulmonary & Critical Care Medicine, and Department of Physiology & Pharmacology, Oregon Health & Science University; Section of Pulmonary & Critical Care Medicine, Portland V.A. Medical Center

*“Differential Regulation of Neurotransmitter Release by Calcium”*

**Anthony Samuel Lamantia, Ph.D.**, Professor of Pharmacology and Physiology; Director, The George Washington Institute of Neuroscience, The George Washington University School of Medicine and Health Sciences

*“When Half is Not Enough: DiGeorge/22q11 Deletion Syndrome and Disorders of Cortical Circuit Development”*

**Leslie C. Griffith, M.D., Ph.D.**, Nancy Lurie Marks Professor of Neuroscience; Director, Volen National Center for Complex Systems, Department of Biology, Brandeis University, Waltham, Massachusetts

*“Sleep: Insights into an Essential Behavior from an Insect Model”*

**Yang Dan, Ph.D.**, Department of Molecular and Cell Biology, Helen Wills Neuroscience Institute, University of California, Berkeley; Howard Hughes Medical Institute

*“Basal Forebrain Modulation of Brain States”*

**Caroline A. Montojo, Ph.D.**, Laboratory of Dr. Carrie Bearden, Semel Institute for Neuroscience and Human Behavior, and the Department of Psychology, University of California, Los Angeles

*“Dysfunctional Cognitive Control as a Liability Factor for Psychosis in a Genetic High Risk Population”*

**Anatol Kreitzer, Ph.D.**, The Gladstone Institute, and the Department of Physiology and Neurology, University of California, San Francisco

*“Using Optogenetic Approaches to Elucidate and Reverse Motor Dysfunction Associated with Parkinson's Disease”*

**Martin Chalfie, Ph.D.**, Nobel Laureate in Chemistry 2008; William R Kenan Jr. Professor of Biological Sciences, Columbia University, New York

*“Mechanosensory Transduction and its Modification in C. elegans”*

Winter 2014

Aaron Diantonio, Ph.D., Department of Developmental Biology, Washington University School of Medicine, St. Louis, Missouri

*“Walking the Highwire from Synaptic Growth to the Axonal Injury Response”*

Jeffrey L. Noebels, M.D., Ph.D., Cullen Trust for Health Care Endowed Chair, Departments of Neurology, Neuroscience, and Molecular and Human Genetics, Baylor College of Medical, Houston, Texas

*“From Shaker to SUMO: Potassium Channels in Epilepsy”*

Rosa Cossart, Ph.D., INMED, INSERM, Marseille, France

*“A Neuronal ‘Birthright’ in the Functional Organization of Hippocampal Networks in Health and Disease”*

Scott M. Sternson, Ph.D., Howard Hughes Medical Institute, Janelia Farm Research Campus, Ashburn, Virginia

*“Neural Circuits and Motivational Mechanisms for Hunger”*

Jeff Magee, Ph.D., Howard Hughes Medical Institute, Janelia Farm Research Campus, Ashburn, Virginia

*“Low Level Information Processing in Neocortical and Hippocampal Microcircuits”*

Mark T. D’Esposito, M.D., Professor of Neuroscience and Psychology, Director, Henry H. Wheeler, Jr. Brain Imaging Center, Helen Wills Neuroscience Institute, University of California, Berkeley

*“A Blueprint for Cognitive Control: Multiple Neural Mechanisms”*

Joseph F. Cheer, Ph.D., Department of Anatomy & Neurobiology, and Psychiatry, Graduate Program in Neuroscience, University of Maryland School of Medicine, Baltimore

*“Endogenous Cannabinoids and the Neurobiological Control of Motivated Behavior”*

David A. McCormick, Ph.D., Department of Neurobiology, Yale University School of Medicine, New Haven, Connecticut

*“Cortical States: Cellular and Network Mechanisms”*

John L.R. Rubenstein M.D., Ph.D., Nina Ireland Distinguished Professor in Child Psychiatry; Nina Ireland Laboratory of Developmental Neurobiology, Center for Neurobiology and Psychiatry, Department of Psychiatry, University of California, San Francisco

*“Transcriptional Control of Cell Fate in the Developing Telencephalon”*

Spring 2014

David Crews, Ph.D., Ashbel Smith Professor of Zoology and Psychology, University of Texas at Austin

*“Sex, Nature and Nurture: Ancestral Exposure Modifies Sex Differences in Stress Reactivity”*

Ahmad Hariri, Ph.D., 2000 Interdepartmental Graduate Program for Neuroscience UCLA Alumni; Department of Psychology & Neuroscience, and Institute for Genome Sciences & Policy, Duke University, Durham, North Carolina

*“Above it All: Epigenetic Regulation of Behaviorally and Clinically Relevant Human Brain Function”*

Yi Zuo, Ph.D., Department of Molecular Cell and Developmental Biology, University of California, Santa Cruz

*“Synapse Reorganization in the Living Brain”*

Nicola J. Allen, Ph.D., Molecular Neurobiology Laboratory, Salk Institute for Biological Sciences, La Jolla, California

*“Astrocyte Regulation of Neuronal Glutamate Receptors”*

Yuh Nung Jan, Ph.D., Howard Hughes Medical Institute; Department of Physiology, University of California, San Francisco

*“Dendrites: From Form to Function”*

Leslie G. Ungerleider, Ph.D., NIH Distinguished Investigator, Chief, Laboratory of Brain and Cognition, National Institute of Mental Health, Bethesda, Maryland

*“Functional Architecture of Face Processing in the Primate Brain”*

Dana Small, Ph.D., Departments of Psychiatry and of Psychology; The John B. Pierce Laboratory, Yale University School of Medicine, New Haven, Connecticut

*“Creating Flavor Percepts and Preferences”*

Satoru Miura, Ph.D., Postdoctoral Research Fellow, Scanziani Lab, HHMI, University of California, San Diego

*“No Two Neurons Are the Same: Unique Identities for Neural Circuit Assembly”*

Loren Frank, Ph.D., Center for Integrative Neuroscience and Department of Physiology, University of California, San Francisco

*“Neural Substrates of Memory and Decision Making”*

Alcino J. Silva, Ph.D., Departments of Neurobiology, Psychiatry & Biological Sciences, and Psychology; Integrative Center for Learning & Memory, UCLA

*“The Exciting Road from Mechanisms of Learning to the Treatment of Cognitive Disorders”*

## THE TWENTY-FIFTH ANNUAL BRAIN RESEARCH INSTITUTE NEUROSCIENCE POSTER SESSION

The BRI Neuroscience Poster Session, featuring the research of all UCLA neuroscientists, including predoctoral students and postdoctoral fellows, was initiated in 1989. This year, the 25th Annual Neuroscience Poster Session was held on December 3, 2013. The Poster Session was attended by well over 300 neuroscientists comprised of graduate students, postdoctoral fellows, and faculty members that represent a multitude of departments on campus. Over 150 posters were presented, many of which had been presented at the 43rd Annual Meeting of the Society for Neuroscience. The guest speaker this year was Dr. Martin Chalfie, Ph.D., Nobel Laureate in Chemistry 2008, and William R. Kenan Jr. Professor of Biological Sciences at Columbia University in New York. He presented, “Mechanosensory Transduction and its Modification in *C. elegans*,” to a standing-room-only crowd. This yearly poster session represents continuing efforts to educate investigators about state-of-the-art neuroscience research being conducted at UCLA.

## H.W. MAGOUN DISTINGUISHED LECTURESHIP

The H.W. Magoun Lecture was instituted in 1989 as an annual lecture both to honor the BRI's founder, Dr. Horace (Tid) Magoun, and to recognize outstanding achievements by BRI members. The lecturer is selected by a faculty committee, which evaluates nominations from the membership at large.

Alcino J. Silva, Ph.D., Professor of Neurobiology, Psychiatry & Biobehavioral Sciences, and Psychology, and Director of the Integrative Center for Learning & Memory, University of California, Los Angeles, was selected as the Twenty-Fifth Annual H.W. Magoun Lecturer. Dr. Silva's lecture, "The Exciting Road from Mechanisms of Learning to the Treatment of Cognitive Disorders" was presented to the neuroscience community on June 3, 2014.

Dr. Silva has made incredible contributions to field of learning and memory and he is essentially the founder of the field of molecular cognition. His discoveries have been transformative: by using a combination of transgenics, electrophysiology and behavior he has been the first to tie distinct molecules needed for synaptic plasticity to learning and memory. His work was among the first to demonstrate the molecular underpinnings of memory consolidation. Finally he is a pioneer in studying how distinct circuit elements attract or store memories, a phenomenon called memory allocation. He is a dynamic leader in the field and his work is amplified by dozens of labs that are expanding upon his initial findings and ideas.

Dr. Silva introduced genetically modified animals (knockouts) to the study of learning and memory. This completely revolutionized the field; it was a complete game changer. Besides introducing the field to this technology, he effectively used it to establish the importance of several molecules to memory formation. His papers on Creb and  $\alpha$ -CamKII are examples, each having nearly 1,000 citations and contributing to his H-index of 58. His most recent work may be of equal importance. He asked the question, why do some neurons get incorporated into the network underlying a memory representation, while others do not? And he has provided highly supportive evidence that the expression level of Creb is the switch that makes this determination. In that way he established a new area called "memory allocation." While that work is new, it is likely that his papers in *Science* and *Nature Neuroscience* will also be recognized as groundbreaking classics.

Dr. Silva has also made major contributions to UCLA, in particular his spearheading of the the UCLA Integrative Center for Learning and Memory. For these numerous reasons, this is a well-deserved recognition of an outstanding scientist and citizen of the UCLA neuroscience community.

Previous H.W. Magoun Distinguished Lecturers include:

- First Annual H.W. Magoun Distinguished Lecturer: William H. Oldendorf, M.D.
- Second Annual H.W. Magoun Distinguished Lecturer: Arnold B. Scheibel, M.D.
- Third Annual H.W. Magoun Distinguished Lecturer: Joaquin Fuster, M.D.
- Fourth Annual H.W. Magoun Distinguished Lecturer: Francisco Bezanilla, Ph.D.
- Fifth Annual H.W. Magoun Distinguished Lecturer: John C. Liebeskind, Ph.D.
- Sixth Annual H.W. Magoun Distinguished Lecturer: Elizabeth F. Neufeld, Ph.D.
- Seventh Annual H.W. Magoun Distinguished Lecturer: Enrico Stefani, M.D., Ph.D.
- Eighth Annual H.W. Magoun Distinguished Lecturer: Lutz Birnbaumer, Ph.D.
- Ninth Annual H.W. Magoun Distinguished Lecturer: Lawrence Kruger, Ph.D.
- Tenth Annual H.W. Magoun Distinguished Lecturer: William M. Pardridge, M.D.
- Eleventh Annual H.W. Magoun Distinguished Lecturer: S. Lawrence Zipursky, Ph.D.
- Twelfth Annual H.W. Magoun Distinguished Lecturer: Debora Farber, Ph.D., D.Ph.hc.
- Thirteenth Annual H.W. Magoun Distinguished Lecturer: Anthony Campagnoni, Ph.D.
- Fourteenth Annual H.W. Magoun Distinguished Lecturer: Arthur P. Arnold, Ph.D.
- Fifteenth Annual H.W. Magoun Distinguished Lecturer: Allan J. Tobin, Ph.D.
- Sixteenth Annual H.W. Magoun Distinguished Lecturer: Jack L. Feldman, Ph.D.
- Seventeenth Annual H.W. Magoun Distinguished Lecturer: Jerome M. Siegel, Ph.D.

Eighteenth Annual H.W. Magoun Distinguished Lecturer: Richard W. Olsen, Ph.D.  
Nineteenth Annual H.W. Magoun Distinguished Lecturer: Diane M. Papazian, Ph.D.  
Twentieth Annual H.W. Magoun Distinguished Lecturer: Michael S. Fanselow, Ph.D.  
Twenty-First Annual H.W. Magoun Distinguished Lecturer: Ronald M. Harper, Ph.D.  
Twenty-Second Annual H.W. Magoun Distinguished Lecturer: Kelsey C. Martin, M.D., Ph.D.  
Twenty-Third Annual H.W. Magoun Distinguished Lecturer: Daniel H. Geschwind, M.D., Ph.D.  
Twenty-Fourth Annual H.W. Magoun Distinguished Lecturer: V. Reggie Edgerton, Ph.D.

#### **DR. EVA MARY KAVAN PRIZE FOR EXCELLENCE IN RESEARCH ON THE BRAIN**

The Eva Mary Kavan Prize for Excellence in Research on the Brain was established in 1999 by a generous endowment from Dr. Eva Kavan. Dr. Kavan earned her doctorate degree in medicine at Charles University in her native Prague, Czechoslovakia. She came to UCLA in 1956 at a time when there were only five hospitals performing open-heart surgery with a heart-lung machine; UCLA had one of the first teams to do open-heart surgery in the West. Dr. Kavan was a pioneer in the administration of anesthesia, utilizing the electroencephalogram to perform important research on the effects of the heart-lung machine on brain function during open-heart operations. Dr. Kavan created this award, which is to be announced at the H.W. Magoun Lecture, to encourage a talented young scholar to pursue scientific research on the brain.

Each year a prize is given to one graduate student who has demonstrated excellence in his or her field of basic research in neuroscience. The awardee is selected by a faculty committee, which evaluates nominations solicited from the UCLA neuroscience community. One student from any neuroscience research department at UCLA receives a cash prize and a certificate of merit.

This year, Jamee Berg was chosen as the recipient of the 16<sup>th</sup> Eva Mary Kavan Prize for Excellence in Research on the Brain. Jamee has worked in the Geschwind laboratory as a graduate student since 2008 and recently defended her thesis. "Her productivity in my laboratory has been nothing short of unbelievable. She is organized, creative, with a high level of motivation and drive, and worked in my lab at such an outstanding level as a technician that we both decided it was important for her to pursue a Ph.D. in Neuroscience, and she entered the program in 2008. She has now completed her graduate work, and decided to continue her work in my laboratory developing the CLARITY technique. Her dissertation, which was recently approved, is nothing short of exceptional, both in its content and clear writing style."

During her graduate work Jamee focused on defining the function of an autism candidate gene, JAKMIP1, about which little was known before she started. She has led an extensive collection of experiments to characterize its developmental role via its proteomic interactors, show that it regulates neuronal translation, and create a knockout mouse, which she has extensively characterized. This work is currently in the process of being submitted to *Nature*, as it provides another key piece of evidence that translational regulation disruption is a core pathway to autistic like behavior. Last year, Jamee also co-wrote a superb and high impact review on autism genetics with Dr. Geschwind, published in *Genome Biology*. Jamee showed remarkable creativity and insight in pulling together and synthesizing a diverse, complex literature out of literally hundreds of quality papers in the field. She also made significant experimental contributions to an earlier paper published in *Nature*, on FoxP2 evolution in humans and non-human primates. Jamee received several scholarships and awards while a graduate student, as well as an NRSA.

Jamee has made major contributions during her graduate training, and is very deserving of the Kavan Prize.

Previous Eva Kavan Prize Recipients		
Year	Student	Mentor and Research Project
1999 1 <sup>st</sup> Eva Kavan Prize Recipient	Albert Cha	Francisco Bezanilla Laboratory Research Project: Ion channels
2000 2 <sup>nd</sup> Eva Kavan Prize Recipient	U. Valentin Nägerl	Istvan Mody Laboratory Research Project: Calbindin and other intracellular calcium-binding proteins in the calcium-buffering capacity of central neurons and the role of these proteins in temporal lobe epilepsy
2001 3 <sup>rd</sup> Eva Kavan Prize Recipient	Michael Zeineh	Susan Bookheimer Laboratory Research Project: Novel methods of increasing the resolution of functional magnetic resonance imaging
2002 4 <sup>th</sup> Eva Kavan Prize Recipient	Christine Bredfeldt	Dario Ringach Laboratory Research Project: Focused on one of the basic transformations in visual processing observed between the lateral geniculate nucleus and primary visual cortex (area V1)
2003 5 <sup>th</sup> Eva Kavan Prize Recipient	Jeffrey Gotts	Marie-Françoise Chesselet Laboratory Research Project: Mechanism by which cortical lesions induce a large increase in cell numbers in the subependymal layer of adult rats
2004 6 <sup>th</sup> Eva Kavan Prize Recipient	Alison Burggren	Susan Bookheimer Laboratory Research Project: Alzheimer's Disease
2005 7 <sup>th</sup> Eva Kavan Prize Recipient	Kim Thompson	Kelsey Martin Laboratory Research Project: Pioneering studies on the mechanisms whereby signals are retrogradely transported from distal synapses to the nucleus in neurons
2006 8 <sup>th</sup> Eva Kavan Prize Recipient	Mary Kay Lobo	X. William Yang Laboratory Research Project: Application of molecular genetic tools to study basal ganglia biology and disease
2007 9 <sup>th</sup> Eva Kavan Prize Recipient	Joshua Johansen	H. Tad Blair Laboratory Research Project: Groundbreaking work on the circuit and computational mechanisms of teaching signal processing in the fear conditioning system
2008 10 <sup>th</sup> Eva Kavan Prize Recipient	Michael Oldham	Daniel Geschwind Laboratory Research Project: Foundational research on the organization of the human brain transcriptome
2009 11 <sup>th</sup> Eva Kavan Prize Recipient	Tiago Carvalho	Dean Buonomano Laboratory Research Project: How excitatory and inhibitory synaptic plasticity interact in a concerted manner to govern neuron behavior
2010 12 <sup>th</sup> Eva Kavan Prize Recipient	Kate Wassum	Nigel Maidment Laboratory Research Project: Identifying dissociable roles for endogenous opioids in mediating reward palatability and incentive learning.



Previous Eva Kavan Prize Recipients		
Year	Student	Mentor and Research Project
2011 13 <sup>th</sup> Eva Kavan Prize Recipient	Erin Gray	Thomas O'Dell Laboratory Research Project: Electrophysiological and molecular studies of the role of AMPA receptor phosphorylation in synaptic plasticity.
2012 14 <sup>th</sup> Eva Kavan Prize Recipient	Austin Hilliard	Stephanie White Laboratory Research Project: Human cognitive abilities that are articulated in the domains of music and language; neuromolecular networks involved in how the brain accomplishes vocal learning, such as speech, using the songbird as a model system.
2013 15 <sup>th</sup> Eva Kavan Prize Recipient	Sangmok Kim	Kelsey Martin Laboratory Research Project: How gene expression is spatially regulated within neurons during synapse formation and synaptic plasticity; addressing these questions in the <i>Aplysia californica</i> sensory-motor neuron culture system, in order to monitor synapse formation and plasticity at the level of individual neurons.
2014 16 <sup>th</sup> Eva Kavan Prize Recipient	Jamee Berg	Daniel Geschwind Laboratory Research Project: Defining the function of an autism candidate gene, JAKMIP1 with an extensive collection of experiments to characterize its developmental role via its proteomic interactors, showing that it regulates neuronal translation, and creating a knockout mouse, which has been extensively characterized.

### SAMUEL EIDUSON STUDENT LECTURESHIP

The Samuel Eiduson Student Lectureship was initiated in 1993 to recognize extraordinarily meritorious contributions by a neuroscience graduate student. This lectureship was named in honor of Dr. Samuel Eiduson for his many years of dedication to the Neuroscience Program and the Brain Research Institute. Dr. Eiduson served as the Chairman of the Interdepartmental Program for Neuroscience from its inception in 1972 until 1985, and was instrumental in forwarding the careers of many UCLA neuroscientists and graduates. Each year one student who has conducted especially commendable research during his/her thesis study is selected to deliver a lecture to the neuroscience community.

This year the Twenty-Second Samuel Eiduson Student Lecture, "No Two Neurons Are the Same: Unique Identities for Neural Circuit Assembly," was presented May 20, 2014, by Satoru Miura, a graduate of the Department of Biological Chemistry Ph.D. program (having worked in the laboratory of Dr. Larry Zipursky) who is currently a Postdoctoral Research Fellow, in the Massimo Scanziani laboratory at the Howard Hughes Medical Institute at the University of California, San Diego.

Satoru joined the Zipursky lab as a graduate student in the ACCESS program with support from the prestigious Nakajima Foundation. He graduated from the University of Tokyo and there pursued research with

Hitoshi Sakano, a developmental neurobiologist studying the molecular mechanisms regulating wiring of the mouse olfactory system. It was here that Satoru developed a keen interest in the developmental strategies by which neurons form circuits. “Satoru joined my lab to study how the Dscam1 family of proteins regulates neural circuit assembly. The primary transcript of the Dscam1 gene can be alternatively spliced to generate some 19000 isoforms and a major goal of the work in my lab over the last decade has been to understand how this diversity contributes to neural circuit assembly.” One remaining question, and a particularly challenging one, was how Dscam1 isoform expression was regulated. Satoru took on this problem with steely determination. Although expression of Dscam1 had been studied in a few classes of neurons using RT-PCR analysis on single FACs sorted cells, analysis of expression in vivo was problematic for a variety of technical reasons. Satoru devised a nifty strategy to engineer the Dscam1 locus to facilitate tracking the expression of different isoforms in vivo. The Dscam1 locus comprises blocks of multiple versions of exon 4, exon 6 and exon 9, each then lead to the production of multiple variable immunoglobulin-like recognition domains. Satoru modified the locus through what is called “ends out” homologous recombination. The modified locus then allowed shuttling into this genetic background modified versions of the entire block of alternative versions of exon 4 (i.e. using a bacterial recombination systems introduced into specific fly strains), such that cells would turn color (i.e. GFP expression) if, and only if, one of the 12 alternative versions were incorporated into the mRNA via alternative splicing. By generating 12 different versions of these so-called reporter constructs in different Drosophila strains, he was able to follow the splicing patterns of each alternative exon. Generating the mutant lines was a tour de force. His studies led to the following conclusions: 1. Specific cell types do not express the same isoform. This puts crucial constraints on models for how Dscam1 functions to mediate interactions between neurons; 2. He discovered by analyzing 42 cells, identified by their unique positions within the animal, their morphology and marker expression, that each cell expressed specific isoforms in a probabilistic fashion; 3. By analyzing different types of cells he discovered that while expression in any given cell is random the distribution of exons expressed varies between cell types; and 4. Cells switch isoform expression during development. These data support the view that each neuron acquires a unique identity via probabilistic expression of different isoforms. This unique identity is essential to promote the process of self-avoidance, which in turn plays a crucial role in regulating circuit assembly. Satoru’s paper describing this work was published in *Cell* last fall.”

In summary, Satoru has made important contributions to developmental neurobiology from his graduate work and has a marvelous future ahead of him. Satoru is a truly remarkable scientist and this award is truly well-deserved.

Previous Samuel Eiduson Student Lecturers		
Year	Student	Lecture Title
1993 1 <sup>st</sup> Eiduson Student Lecturer	David Rector	“Illuminating the Brain: Neural Activation Produces Changes in Light Scattering”
1994 2 <sup>nd</sup> Eiduson Student Lecturer	Michael DeRosa	“Why Do Children Seize? What Epileptic Brain Tissue Tells Us”
1995 3 <sup>rd</sup> Eiduson Student Lecturer	Kerry Thompson	“Focal Status Epilepticus in the Immature Brain”
1996 4 <sup>th</sup> Eiduson Student Lecturer	Li-Tao Zhong	“A Novel Type of Cell Death Receptor in Neocortical Neurons”
1997 5 <sup>th</sup> Eiduson Student Lecturer	Christine Schulteis	“Aspects of Shaker Potassium Channel Biogenesis Revealed by Analysis of Mutant Subunits”
1998 6 <sup>th</sup> Eiduson Student Lecturer	Paul Thompson	“Mathematical/Computational Strategies for Human Brain Mapping and Pathology Detection”

Previous Samuel Eiduson Student Lecturers		
Year	Student	Lecture Title
1999 7 <sup>th</sup> Eiduson Student Lecturer	Albert Cha	“Using Optical Probes to Study the Behavior of Voltage-Gated Ion Channels”
2000 8 <sup>th</sup> Eiduson Student Lecturer	Paul Gray	“Every Breath You Take: Looking for the Respiratory Rhythm Generator”
2001 9 <sup>th</sup> Eiduson Student Lecturer	Holly Carlisle	“The Role of NMDA Receptor Associated Proteins in Hippocampal LTP”
2002 10 <sup>th</sup> Eiduson Student Lecturer	Robert Agate	“Sex Chromosomes as Carriers for Genes Involved in Sex Specific Brain Development”
2003 11 <sup>th</sup> Eiduson Student Lecturer	Christopher Cain	“Overcoming Fear: Behavioral Pharmacology and Physiology of Fear Extinction in Mice”
2004 12 <sup>th</sup> Eiduson Student Lecturer	Spencer Smith	“The Role of Spontaneously Firing Neurons and New Tools for Exploring Them”
2005 13 <sup>th</sup> Eiduson Student Lecturer	Keri Martinowich	“Epigenetic Gene Regulation in Mental Retardation Disorders”
2006 14 <sup>th</sup> Eiduson Student Lecturer	John Ohab	“A Novel Neurovascular Niche for Neurogenesis after Stroke”
2007 15 <sup>th</sup> Eiduson Student Lecturer	Louisa Wang	“The Circadian Regulation of Learning and Memory”
2008 16 <sup>th</sup> Eiduson Student Lecturer	Woj Wojtowicz	“A Role for Molecular Diversity and Specificity in Wiring the Fly Brain”
2009 17 <sup>th</sup> Eiduson Student Lecturer	Doris Payer	“Neural Correlates of Emotion and Inhibitory Control During Early Abstinence from Methamphetamine”
2010 18 <sup>th</sup> Eiduson Student Lecturer	David Rousso	“Successive Actions of FoxP Transcription Factors in Spinal Cord Neurogenesis and the Establishment of Motor Circuits”
2011 19 <sup>th</sup> Eiduson Student Lecturer	Jason Stein	“Searching for Genetic Influences on Brain Structure”
2012 20 <sup>th</sup> Eiduson Student Lecturer	Stephanie Groman	“Dopamine D <sub>2</sub> -Like Receptors: At the Nexus between Self Control and Addiction”
2013 21 <sup>st</sup> Eiduson Student Lecturer	Jesse Brown	“Multimodality MRI-based Brain Network Analysis: Applications to Genetic Risk for Alzheimer’s Disease”
2014 22 <sup>nd</sup> Eiduson Student Lecturer	Satoru Miura	“No Two Neurons Are the Same: Unique Identities for Neural Circuit Assembly”

The Brain Research Institute is proud to have created a lecture series designed to spotlight the achievements of its neuroscience graduate students.

**ARNOLD SCHEIBEL DISTINGUISHED POSTDOCTORAL FELLOW IN NEUROSCIENCE LECTURE**

In 2004 the Brain Research Institute initiated the Arnold Scheibel Distinguished Postdoctoral Fellow in Neuroscience Lecture. This annual lecture honors one postdoctoral fellow for outstanding research in neuroscience, and includes presentation of a lecture in the Joint Seminars in Neuroscience series, and a prize to attend a scientific meeting during the year.

This year, the Eleventh Annual Distinguished Postdoctoral Lecturer was Caroline Montojo, Ph.D., a postdoctoral fellow working in the laboratory of Dr. Carrie Bearden in the Semel Institute for Neuroscience and Human Behavior, and the Department of Psychology. Her lecture, “Dysfunctional Cognitive Control as a Liability Factor for Psychosis in a Genetic High Risk Population” was presented to the neuroscience community on November 5, 2013.

<b>Previous Arnold Scheibel Distinguished Postdoctoral Fellow in Neuroscience Lecture</b>		
<b>Year</b>	<b>Postdoctoral Fellow</b>	<b>Lecture Title</b>
2004 1 <sup>st</sup> Scheibel Distinguished Postdoctoral Fellow in Neuroscience Lecture	Bingbing Song, M.D., Ph.D.	“Release of Endogenous Opioids in the Spinal Cord Measured Through Mu-opioid Receptor Internalization”
2005 2 <sup>nd</sup> Scheibel Distinguished Postdoctoral Fellow in Neuroscience Lecture	Sheila Fleming, Ph.D.	“Behavioral Phenotyping of Genetic Mouse Models of Parkinson’s Disease”
2006 3 <sup>rd</sup> Scheibel Distinguished Postdoctoral Fellow in Neuroscience Lecture	Catalina Abad, Ph.D.	“VIP and PACAP: Two Neuropeptides with Therapeutic Prospects”
2007 4 <sup>th</sup> Scheibel Distinguished Postdoctoral Fellow in Neuroscience Lecture	Bruno Bianchi, Ph.D.	“Deciphering Neurological Disorder Mechanisms Using Genetically Modified Human Neurons Derived from Human Embryonic Stem Cells”
2008 5 <sup>th</sup> Scheibel Distinguished Postdoctoral Fellow in Neuroscience Lecture	Grégoire Courtine, Ph.D.	“Regaining Stepping Capacities Following a Severe Spinal Cord Injury”
2008 6 <sup>th</sup> Scheibel Distinguished Postdoctoral Fellow in Neuroscience Lecture	Arne Ekstrom, Ph.D.	“Correlation Between Navigational Performance and Place Cell Recruitment in the Human Hippocampal Area”
2009 7 <sup>th</sup> Scheibel Distinguished Postdoctoral Fellow in Neuroscience	Dan Ohtan Wang, Ph.D.	“Visualizing New Protein Synthesis at Synapses During Neuronal Plasticity”
2010 8 <sup>th</sup> Scheibel Distinguished Postdoctoral Fellow in Neuroscience	Eiji Shigetomi, Ph.D.	“Astrocyte Calcium Dynamics Revealed by a Refined Genetically Encoded Calcium Indicator”
2011 9 <sup>th</sup> Scheibel Distinguished Postdoctoral Fellow in Neuroscience	Kate Wassum, Ph.D.	“Liking, Learning and Longing: Exploring the Role of Mesolimbic Dopamine Signaling in Reward Seeking Actions”
2012 10 <sup>th</sup> Scheibel Distinguished Postdoctoral Fellow in Neuroscience	Paul Mathews, Ph.D.	“Shining Light on the Role of the Climbing Fiber Pathway in the Cerebellar Cortex”
2013 11 <sup>th</sup> Scheibel Distinguished Postdoctoral Fellow in Neuroscience	Caroline Montojo, Ph.D.	“Dysfunctional Cognitive Control as a Liability Factor for Psychosis in a Genetic High Risk Population”

SPECIAL LECTURE SERIES (Sponsored or Co-Sponsored by the Brain Research Institute)

Neurogenetics Affinity Group & Consortium for Neuropsychiatric Phenomics Lectures

Fall 2013

**Jon Mill, Ph.D.**, Deputy Chair of the Psychiatric Epigenetics Group, Exeter University Medical School & King's College, London

*“Epigenomic Trajectories to Neuropsychiatric Disease”*

**Shyam Prabhakar, Ph.D.**, Associate Director, Integrative Genomics, Genome Institute of Singapore

*“Noncoding Origins of Anthropoid Traits and a New Null Model of Repeat Functionalization”*

**Marina Picciotto, Ph.D.**, Professor and Deputy Chair for Basic Research, Charles B.G. Murphy Chair in Psychiatry, Professor of Neurobiology and Pharmacology, Yale University School of Medicine

*“Distinct Nicotinic Cholinergic Mechanisms Underlying Regulation of Food Intake and Corticothalamic Development”*

**Peyman Golshani, M.D., Ph.D.**, Assistant Professor, Department of Neurology, David Geffen School of Medicine, UCLA; Neurologist, WLAVA Medical Center

*“Cell-Specific Cortical Intrinsic Excitability and Connectivity Alterations in a Model of Autism”*

**Gerald Rubin, Ph.D.**, Vice President, HHMI, Executive Director, Janelia Farm Research Campus Ashburn Virginia

*“Janelia Farm: An Experiment in Scientific Culture”*

**Hans Hofmann, Ph.D.**, Director, Center for Computational Biology and Bioinformatics, Co-Director, Center for Brain, Behavior and Evolution, Co-Director, Neural Systems and Behavior Course (MBL), University of Texas at Austin

*“Genes, Circuits, and Behavior: Evolution of Social Decision-Making Mechanisms”*

**Samuel L. Pfaff, Ph.D.**, Investigator, Howard Hughes Medical Institute, Professor, Gene Expression Laboratory, Benjamin H. Lewis Chair in Neuroscience, The Salk Institute for Biological Studies

*“Spinal Locomotor Circuits: Development and Degenerative Diseases”*

Winter 2014

**Yoav Gilad, Ph.D.**, Professor, Department of Human Genetics, University of Chicago

*“Understanding Gene Regulatory Variation Within and Between Species”*

**Eric Huang, M.D., Ph.D.**, Department of Pathology, University of California, San Francisco

*“Finding Connections Between Genes and Diseases in ALS: Lessons from Animal Models and Human Disease”*

**Bruce Lamb, Ph.D.**, Department of Neurosciences, Lerner Research Institute, Cleveland Clinic

*“The Role of Innate Immune Pathways in Alzheimer’s Disease Pathogenesis”*

**Susan Alberts, Ph.D.**, Bass Fellow and Professor of Biology, Duke University, Durham, North Carolina

*“Phenotypes and Genotypes: The Biology of a Wild Primate Population”*

Mary Kay Lobo, Ph.D., Assistant Professor, University of Maryland School of Medicine  
*“Molecular and Functional Roles of Nucleus Accumbens Circuits in Motivational Behaviors”*

Magdalena Skipper, Senior Editor, Nature  
*“Behind the Scenes at Nature”*

Anthony J. Wynshaw-Boris, M.D., Ph.D., James H. Jewell MD '34 Professor of Genetics, Chair, Department of Genetics and Genome Sciences, Case Western Reserve, University School of Medicine  
*“Investigating the Pathophysiology of Autism Using Mouse and iPSC Models”*

Spring 2014

Leonid Kruglyak, Ph.D., Professor, Department of Biological Chemistry, UCLA  
*“Complex Trait Genetics: Lessons from Yeast”*

Peter Tsai, M.D., Ph.D., Boston Children's Hospital  
*“Cerebellar Dysfunction and Autistic Behavior: Insights from a Mouse Model of Tuberous Sclerosis Complex”*

Jonathan Flint, FRC Psych, FMedSci, Michael Davys Professor of Neuroscience and Fellow of Merton College, University of Oxford, United Kingdom  
*“The Genetic Basis of Major Depression”*

Laura Zahn, Ph.D., Senior Editor, Science  
*“An Editor's Perspective on Scientific Publishing”*

Eliza Congdon, Ph.D., Department of Psychiatry & Biobehavioral Sciences, UCLA  
*“Gene Expression Profiles of ECT Response in Major Depressive Disorder”*

Ajit Varki, M.D., Distinguished Professor of Medicine and Cellular & Molecular Medicine, Co-Director, Glycobiology Research and Training Center, Co-Director, UCSD/Salk Center for Academic Research and Training in Anthropogeny (CARTA)  
*“The Mind over Reality Theory of Human Origins”*

Synapse to Circuit Club Affinity Group

Fall 2013

Xiao-Hong Lu, Ph.D., William Yang Laboratory, Department of Psychiatry and Biobehavioral Sciences, UCLA  
*“Targeting Huntington's Disease: New Gene and New Tool to Study HD Pathogenesis and Therapy In Vivo”*

Jacob Aptekar, Mark Frye Laboratory, Department of Integrative Biology & Physiology, and Neurobiology, UCLA  
*“The Neural Basis of Figure-Tracking in Fruit Flies”*

Toh Hean Ch'ng, Ph.D., Kelsey Martin Laboratory, Department of Biological Chemistry, UCLA  
*“Decoding the Activity-Dependent Translocation Signals in CREB Regulated Transcriptional Coactivator 1”*

Gerry Rubin, Ph.D., Janelia Farm Research Campus, Ashburn, Virginia  
*“A Molecular Geneticists Approach to Understanding the Fly Brain”*

Matt Pecot, Ph.D., Larry Zipursky Laboratory, Department of Biological Chemistry, UCLA  
*“Axon-Derived Signals Coordinate Circuit Assembly Within the Drosophila Visual System”*

Vivian Gradinaru, Ph.D., California Institute of Technology, Pasadena, California  
*“Neuromodulation and Neurodegeneration: Insights and Foresights from Optogenetics and Clarity”*

Samantha Butler, Ph.D., Department of Neurobiology, UCLA  
*“Using Developmental Mechanisms to Accelerate Regeneration in the Peripheral Nervous System”*

Yishi Jin, Ph.D., Section of Neurobiology, Department of Cellular and Molecular Medicine; Howard Hughes Medical Institute, UCSD  
*“From Synapse Formation to Axon Regeneration: Roles and Regulation of DLK Kinase”*

Winter 2014

Sara Wasserman, Ph.D., Mark Frye Laboratory, Department of Integrative Biology & Physiology, and Neurobiology, UCLA  
*“Multi-Modal Sensory Integration Underlying Decision-Making in Flying Drosophila”*

Todd Anthony, Ph.D., California Institute of Technology, Pasadena, California  
*“Genetic Dissection of Neural Circuits That Regulate Persistent Anxious States”*

Takaki Komiyama, Ph.D., Silvio Varon Professorship in Neuroregeneration; Section of Neurobiology/Neurosciences, UCSD  
*“Imaging Neuronal Ensembles in Mice during Learning”*

Paul Mathews, Ph.D., Tom Otis Laboratory, Department of Neurobiology, UCLA  
*“Disinhibition Drives Rapid Movement and Associative Motor Memory Formation in the Cerebellum”*

Ji-Ann Lee, Ph.D., Kelsey Martin Laboratory, Department of Biological Chemistry, UCLA  
*“A Cytoplasmic Rbfox1 Isoform Regulates the Expression of Autism Genes in Neurons”*

Kimberly Raab-Graham, Ph.D., Department of Cell and Molecular Biology, University of Texas at Austin  
*“DisTORTing Kv1.1 Balance in Epilepsy”*

Anthony Linares, Douglas Black Laboratory, Department of Microbiology, Immunology & Molecular Genetics, UCLA  
*“Functional Characterization of PTBP1 Regulated Alternative Splicing During Neuronal Differentiation”*

Spring 2014

Wael Tadros Ph.D., Larry Zipursky Laboratory, Department of Biological Chemistry, UCLA  
*“A Molecular Genetic Analysis of Dendritic Wiring”*

Ralph Greenspan, Ph.D., Kavli Institute for Brain and Mind, University of California, San Diego  
*“The Improbable Role of Seymour Benzer and Jeff Hall in the Origins of the BRAIN Initiative”*

Jeff Rasmussen, Ph.D., Alvaro Sagasti Laboratory, Department of Molecular, Cell and Developmental Biology, UCLA

*“Keeping in Touch: Skin Cells Maintain Sensory Endings”*

Celine Vuong, Douglas Black Laboratory, HHMI/Microbiology, Immunology & Molecular Genetics, UCLA

*“The Role of Rbfox1 in Neuronal Excitability”*

Kaiweh Kam, Ph.D., Jack Feldman Laboratory, Department of Neurobiology, UCLA

*“Illuminating Mammalian Microcircuits: Lessons from the Neural Control of Breathing”*

Pablo Garcia-Junco Clemente, Ph.D., Joshua Trachtenberg Laboratory, Department of Neurobiology, UCLA

*“Network Coding of Fear and Extinction in Mouse Frontal Cortex”*

Mariana Fontes, Ph.D., Kelsey Martin Laboratory, Department of Biological Chemistry, UCLA

*“Activity-Dependent Changes in miRNA and Alternative 3'UTR Usage”*

Patrick Chen, Kelsey Martin Laboratory, Department of Biological Chemistry, UCLA

*“Transcriptional and Translational Regulation of Gene Expression after LTP Induction in Hippocampal Neurons”*

Claude Desplan, Ph.D., Department of Biology, New York University, New York

*“Generating Neuronal Diversity in the Drosophila Optic Lobes”*

Pamela Kennedy, Ph.D., Department of Psychology, UCLA

*“Chromatin Cross-Talk in the Nucleus Accumbens: Implications for Cocaine-Induced Behavioral and Molecular Plasticity”*

### Training Program in Neural Repair

Fall 2013

Gerald Lipshutz, M.D., Liver and Surgery Transplantation, Department of Surgery, UCLA

*“Arginase Deficiency: Can Treating the Liver Prevent CNS Impairment?”*

Alon Avidan, M.D., M.P.H., Director, Neurology Clinic, Department of Clinical Neurology, UCLA

*“REM Sleep Behavior Disorder: What Can Sleep Teach Us About Neurodegeneration”*

Felix Schweizer, Ph.D., Department of Neurobiology, UCLA

*“Ketones Alleviate AD Deficits”*

Justin Ichida, Ph.D., Assistant Professor of Stem Cell Biology and Regenerative Medicine, USC

*“Using Lineage Reprogramming to Dissect C9ORF72-based FTL-ALS”*

Araceli Espinosa, Ph.D., Researcher, Jean de Vellis laboratory, Department of Psychiatry & Biobehavioral Sciences, UCLA

*“Oligodendrocytes, Their Functions and Myelin Disorders: Examples of Repair Strategies”*



Clive Svendsen, Ph.D., Director, Cedars-Sinai Regenerative Medicine Institute  
*“Neural Repair and Disease Modeling Using Induced Pluripotent Stem Cells”*

Winter 2014

Rhonda Voskuhl, Ph.D., Department of Neurology, UCLA  
*“Neurodegenerative and Neuroprotective Aspects of Multiple Sclerosis”*

James Byrne, Ph.D., Department of Molecular & Medical Pharmacology, UCLA  
*“Developing Personalized Pluripotent Stem Cell-Based Therapeutics”*

Matt Pecot, Ph.D., Larry Zipursky laboratory, Department of Biological Chemistry, UCLA  
*“Developmental Strategies Underlying Circuit Assembly in the Drosophila Visual System”*

Chris Colwell, Ph.D., Department of Psychiatry & Biobehavioral Sciences, UCLA  
*“Circadian Disruptions in Huntington's Disease: Mechanisms and Possible Treatment Options”*

Zhefeng Guo, Ph.D., Department of Neurology, UCLA  
*“Structural Insights into Amyloid-Related Neurodegenerative Diseases”*

Michael Sofroniew, Ph.D., Department of Neurobiology, UCLA  
*“Modulating Neural Repair and Axon Regrowth with Injectable Biomaterials”*

Neelroop Parikhshak, Daniel Geschwind laboratory, Departments of Neurology, and Psychiatry & Biobehavioral Sciences, UCLA  
*“Gene Expression from Cortex in Neurotypical Development and Autism - Insights into the Molecular Underpinnings of ASD”*

Richard Sutton, Ph.D., Department of Neurosurgery, UCLA  
*“Metabolic Fuel Supplementation to Improve Outcomes after Experimental Traumatic Brain Injury”*

Spring 2014

Carolyn Houser, Ph.D., Department of Neurobiology, UCLA  
*“Reorganized GABA Circuits in Epilepsy”*

Michele Basso, Ph.D., Professor and Director of the Fuster Laboratory of Cognitive Neuroscience, Department of Psychiatry & Biobehavioral Sciences, UCLA  
*“Cognition, Movement and Parkinson's Disease”*

Mayank Mehta, Ph.D., Director, Keck Center for Neurophysics; Professor, Departments of Physics & Astronomy, Neurology, and Neurobiology, UCLA  
*“How Neural Rhythms Influence Neural Circuit Dynamics and Organization”*

Harley Kornblum, Ph.D., Director, Neural Stem Cell Research Center, Semel Institute for Neuroscience and Human Behavior; Professor, Departments of Psychiatry & Biobehavioral Sciences, Molecular and Medical Pharmacology, and Pediatrics, UCLA  
*“Redox Regulation of Stem Cells: From Autism to Glioblastoma”*

Brent Fogel, M.D., Ph.D., Director, Ataxia and Neurogenetics Biobank Program; Department of Neurology, UCLA

*“Mutation of Senataxin Alters Disease-Specific Transcriptional Networks in Patients with Ataxia with Oculomotor Apraxia Type 2”*

Jerome Badaut, Ph.D., Cognitive and Integrative Neuroscience, University of Bordeaux (Institut de Neurosciences Cognitives et Intégratives d'Aquitaine Université de Bordeaux)

*“Longterm Neurovascular Phenotypic Transformation after Early Traumatic Brain Injury: A Future for New Drug Development”*

Diane Papazian, Ph.D., Department of Physiology, David Geffen School of Medicine, UCLA

*“Altered K<sup>+</sup> Channel Gating in Early-Onset Neurodegeneration”*

Albee Messing, V.M.D., Ph.D., Professor of Neuropathology, Waisman Center & Department of Comparative Biosciences, University of Wisconsin-Madison

*“When Astrocytes Fail - What Can We Learn from Alexander Disease?”*

#### UCLA Center for Autism Research and Treatment (CART) Affinity Group Seminars

##### Fall 2013

Dan Geschwind, M.D., Ph.D., UCLA CART Director; Professor, Neurology, Psychiatry & Human Genetics

*“Autism Genetics: Reaching for Coherence”*

Olga Solomon, Ph.D., University of Southern California

*“Family and Community Perspectives on Elopement and Wandering in Autism in an Urban Context”*

Mayada Elsabbagh, Ph.D., McGill University, Montreal, Canada

*“Getting Answers from Babies about Autism”*

##### Winter 2014

Elizabeth Aylward, Ph.D., University of Washington, Seattle

*“Face Processing in ASD: What We’ve Learned from 20 Years of Research”*

John Constantino, M.D., Washington University, St. Louis

*“Quantitative Autistic Traits: Patterns and Mechanisms of Transmission in Families”*

##### Spring 2014

Craig Newschaffer, Ph.D., Drexel University School of Public Health, Philadelphia

*“Epidemiologic Perspectives on Environmental Risk Factors for Autism”*

Peter Mundy, Ph.D., University of California at Davis; Visiting Professor at CART

*“Research on Social Attention and Reading: Implications for School Based Interventions for ASD”*

Marsha Mailick, Ph.D., Waisman Center; University of Wisconsin-Madison

*“Trajectories of Development of Adolescents and Adults with Autism”*

## SPECIAL CONFERENCES (Sponsored or Co-Sponsored by the Brain Research Institute)

### From the Frog Neuromuscular Junction to Bats & Beyond

#### A Symposium to Honor Alan Grinnell

A symposium to honor Dr. Alan Grinnell, "From the Frog Neuromuscular Junction to Bats & Beyond," was held on November 8, 2013. Dr. Grinnell received his B.A. from Harvard in 1958 where for three years he had been conducting research in the laboratory of Dr. Donald Griffen, the discoverer of the phenomenon of echolocation in bats. In his junior year, Dr. Grinnell initiated the study of neural correlates of echolocation skills, a study that he continued as a graduate student and fellow, receiving his Ph.D. degree in 1962. He then spent two years as a postdoctoral fellow in the laboratory of Dr. Bernard Katz at University College London, studying neuromuscular synaptic physiology. In 1964, attracted by the presence of Dr. Ted Bullock and Susumu Hagiwara at UCLA, Dr. Grinnell joined UCLA where he is currently in his 50<sup>th</sup> year. Throughout this time, he has continued to work both in echolocation (throughout the world) and in various aspects of synaptic physiology. In 1978 he became Director of the Jerry Lewis Neuromuscular Research Center, and of the Ahmanson Laboratory of Neurobiology. From 1997-2001 he served as Chair of the Department of Physiological Science (currently the Department of Integrative Biology and Physiology). Since 2011, Dr. Grinnell has served as Associate Dean of Life Sciences at UCLA.

#### Symposium Schedule

##### Welcome and Opening Remarks

Cameron Gundersen, Ph.D., Department of Molecular & Medical Pharmacology, UCLA

Larry Trussell, Ph.D., Oregon Hearing Research Center and Vollum Institute, Oregon Health & Science Institute

##### Session 1 Chair: Cameron Gundersen, Ph.D. Department of Molecular & Medical Pharmacology, UCLA

*Spontaneous Rhythmic Activity in Spinal Motor Circuit Development*

Lynn Landmesser, Ph.D., Department of Neurosciences, Case Western Reserve University

*Synaptic Signaling by Gap Junctions in the Auditory System*

Larry Trussell, Ph.D., Oregon Hearing Research Center and Vollum Institute, Oregon Health & Science Institute

*Manipulating Cerebellar Circuits: Movement, Coordination and Motor Learning*

Tom Otis, Ph.D., Department of Neurobiology, UCLA

##### Session 2 Chair: Jim Weiss, M.D., Departments of Medicine and Physiology, UCLA

*Imaging Methods in Ophthalmology: What I Learned from the Frogs*

Amir Kashani, M.D., Ph.D., Department of Ophthalmology, USC

*Inward Rectification in Mammalian Skeletal Muscle Fibers*

Julio Vergara, Ph.D., Department of Physiology, UCLA

*Calcium Signaling: A Personal Odyssey from Sea Potato to Human Stem Cell-Derived Cardiomyocytes*

Martin Morad, Ph.D., Cardiac Signaling Center of University of South Carolina, MUSC and Clemson University

##### Session 3 Chair: Tom O'Dell, Ph.D., Department of Physiology, UCLA

*Promoting Clinical Neurological Recovery Following Traumatic Peripheral Nerve Injuries*

Damien Kuffler, Ph.D., Institute of Neurobiology, Medical Sciences Campus, University of Puerto Rico

*Structure/Function of Neuromuscular Active Zones and Development of New Treatments for Neuromuscular Disease*

Steve Meriney, Department of Neuroscience, University of Pittsburgh

*Glutamate Modulates Acetylcholine Release at the Neuromuscular Junction*

Paul Brehm, Ph.D., Vollum Institute, Oregon Health & Science University

##### Session 4 Chair: Felix Schweizer, Ph.D., Department of Neurobiology, UCLA

*When is it Smart to Escape, and When is it Smarter to Stay Put?*

Olav Sand, Ph.D., Department of Biological Sciences, University of Oslo

*For the Love of Bats: Alan Grinnell's Link to Bat Natural History and Conservation*

Pat Brown, Ph.D., Brown-Berry Biological Consulting

*Listening to the Bat's Voice: A Window to Perception through Echolocation*

Cindy Moss, Ph.D., Department of Psychology and Institute for Systems Research, Program in Neuroscience and Cognitive Science, University of Maryland and Department of Psychological and Brain Science, Johns Hopkins University

*Tracing Echolocation from Grinnell to Now*

Jim Simmons, Ph.D., Department of Neuroscience, Brown University

Closing Remarks

Alan Grinnell, Ph.D., Department of Physiology, UCLA.

## **Neurodegenerative Disorders: Can Systems Neuroscience and Systems Biology Solve the Riddles?**

### **A UCLA and Gladstone Institutes Symposium**

"Neurodegenerative Disorders: Can Systems Neuroscience and Systems Biology Solve the Riddles?" a UCLA and Gladstone Institutes symposium, organized by Dr. John Mazziotta, Department of Neurology, UCLA and Dr. Lennart Mucke from the Gladstone Institute of Neurological Disease in San Francisco was held on November 19, 2013.

#### Symposium Schedule

John Mazziotta and Lennart Mucke

*Introduction* -including brief overviews of UCLA and Gladstone programs and purpose of symposium.

#### Molecular Networks

Steve Finkbeiner

*Disease-Specific Cascades Converging on Common Mechanisms of Neurodegeneration*

Ming Guo

*Mitochondria: A Convergence Point of Multiple Neurodegenerative Disorders*

Li Gan

*Targeting Protein Turnover in Proteinopathies of the Aging CNS*

Jeff Bronstein

*Counteracting Environmental Risk Factors in Parkinson's Disease*

Yadong Huang

*Counteracting Genetic Risk Factors in Alzheimer's Disease*

Dan Geschwind

*Using Genetics and Systems Biology to Unravel the Complex Pathogenesis of Neurodegenerative Disorders*

#### Cellular Networks

Lennart Mucke

*Mechanisms and Treatment of Neural Network Dysfunction in Alzheimer's Disease and Other Dementias*

Istvan Mody

*Critical Roles of Interneurons in Health and Disease*

Jorge Palop

*Restoring Brain Rhythms and Cognition in Alzheimer Models by Enhancing Inhibitory Interneuron Function*

Mayank Mehta

*Neurophysiological Substrates of Learning and Memory*

William Seeley

*Radiological Imaging of Network Dysfunction in Neurodegenerative Diseases*

Anatol Kreitzer

*Basal Ganglia Circuit Dysfunction Underlying Parkinson's Disease and Dyskinesia*

## **The 12th Annual CNS Basic and Translational Science Symposium**

### **Bringing The Brain Back Into Medicine: From Gut Microbes To Behavioral Interventions**

The 12th Annual CNS Basic and Translational Science Symposium, “Bringing The Brain Back Into Medicine: From Gut Microbes To Behavioral Interventions,” was held on February 28, 2014. The symposium was sponsored by the UCLA Brain Research Institute, the UCLA Division of Digestive Diseases, the VA Greater Los Angeles Healthcare System/Brentwood Biomedical Research Institute, CURE Foundation, the Gail and Gerald Oppenheimer Family Foundation and the Morris A. Hazan Family Foundation. Additional information about the Center can be found on the Center’s website: [www.uclacns.org](http://www.uclacns.org).)

#### Symposium Schedule

Symposium Chairs: Lin Chang, MD (Director, Functional GI Disorders Program - Gail and Gerald Oppenheimer Family Center for Neurobiology of Stress Division of Digestive Diseases, David Geffen School of Medicine at UCLA) and Muriel Larauche, PhD (Assistant Researcher, Division of Digestive Diseases, David Geffen Department of Medicine at UCLA)

#### Introduction

Judy Gasson, PhD, Senior Associate Dean for Research, David Geffen School of Medicine, UCLA

#### *State of the Center*

Emeran Mayer, MD, Director, Gail and Gerald Oppenheimer Family Center for Neurobiology of Stress; Co-Director, CURE: Digestive Diseases Research Center; Division of Digestive Diseases, David Geffen School of Medicine at UCLA

#### Session I

Session Chairs: Lin Chang, MD and Muriel Larauche, PhD

*Research Programs of the Center* (Program highlights and future directions)

Neurocardiology Program, Marmar Vaseghi, MD

Pain Research Program, Bruce Naliboff, PhD

Mind Body Research Program, Kirsten Tillisch, MD

Enteric Neuroscience Program Emeran Mayer, MD

Functional GI Disorders Program, Lin Chang, MD

#### Session II

Session Chairs: Million Mulugeta, DVM, PhD (Adjunct Professor, Division of Digestive Diseases, David Geffen School of Medicine at UCLA) and Andrea Rapkin, MD (Director, UCLA Pelvic Pain Program, Professor, Department of Obstetrics and Gynecology, David Geffen School of Medicine at UCLA)

#### Data Blitz – Research Highlights

*Clinical and Mechanistic Updates on Cardiac Decentralization in the Treatment of Ventricular Arrhythmias*

Olujimi Ajijola, MD, PhD, Clinical Instructor in Medicine, UCLA Cardiac Arrhythmia Center

*Morphological Imaging-Based Brain Signatures Discriminate Obese from Lean Subjects: Examining Central Mechanisms within the Brain*

Arpana Gupta, PhD, Post-Doctoral Scholar, Gail and Gerald Oppenheimer Family Center for Neurobiology of Stress, Division of Digestive Diseases, David Geffen School of Medicine at UCLA

*Central Alterations in Localized Provoked Vulvodynia*

Jennifer Labus, PhD, Adjunct Associate Professor, Gail and Gerald Oppenheimer Family Center for Neurobiology of Stress, Division of Digestive Diseases, David Geffen School of Medicine at UCLA

*Irritable Bowel Syndrome Symptoms Are Related to the Resting Brain’s Sensorimotor Network*

Michelle Chen, BS, Graduate Student - School of Public Health, Gail and Gerald Oppenheimer Family Center for Neurobiology of Stress, Division of Digestive Diseases, David Geffen School of Medicine at UCLA

*Structural and Functional Brain Changes in Inflammatory Bowel Diseases*

Emeran Mayer, MD, Director, Gail and Gerald Oppenheimer Family Center for Neurobiology of Stress; Co-Director, CURE: Digestive Diseases Research Center; Division of Digestive Diseases, David Geffen School of Medicine at UCLA

*Epigenetic Landscape of Irritable Bowel Syndrome*

Swapna Joshi, PhD, Post-Doctoral Scholar, Gail and Gerald Oppenheimer Family Center for Neurobiology of Stress, Division of Digestive Diseases, David Geffen School of Medicine at UCLA

Poster Session

Session III

Session Chair: Charalabos Harry Pothoulakis, MD, (Director, UCLA Research Center for Inflammatory Bowel Diseases, Division of Digestive Diseases, David Geffen School of Medicine at UCLA)

State Of The Art Lectures

*Social Regulation of Human Gene Expression*

Steve Cole, PhD, Professor of Medicine, Department of Hematology-Oncology, UCLA

*Defining and Harnessing the Intestinal Microbiome*

Jonathan Braun, MD, PhD, Co-Director, Jonsson Comprehensive Cancer Center Tumor Immunology Program Area; Professor, Pathology and Laboratory Medicine, UCLA

*Computer-Assisted Cognitive Behavioral Therapy for Anxiety Disorders in Primary Care*

Michelle Craske, PhD, Director, Anxiety Disorders Research Center of UCLA; Professor of Psychology and of Psychiatry and Biobehavioral Sciences, UCLA

Poster Award

Joseph Pisegna, MD, Chief, Division of Gastroenterology and Hepatology, VA Greater Los Angeles Healthcare System; Professor of Medicine, Division of Digestive Diseases, David Geffen School of Medicine at UCLA

Closing Comments

Yvette Taché, PhD, Co-Director, Enteric Neuroscience Program - Gail and Gerald Oppenheimer Family Center for Neurobiology of Stress; Director, CURE: Animal Models Core; Professor, Division of Digestive Diseases, David Geffen School of Medicine at UCLA

**Tools for Integrating and Planning Experiments in Neuroscience**

Tools for Integrating and Planning Experiments in Neuroscience, a full-day symposium was held on March 11, 2014. The increasing volume, complexity and interconnectedness of data and published studies in neuroscience make it difficult to determine what is known, what is uncertain, and how to contribute effectively to one's field. The speakers in this ICLM symposium presented ideas and tools to tackle this increasingly urgent problem. The symposium was sponsored by the UCLA Semel Institute, the UCLA Brain Research Institute, and the Integrative Center for Learning & Memory at UCLA.

Symposium Schedule

Welcome and Opening Remarks

Peter C. Whybrow, M.D., Professor and Executive Chair, Department of Psychiatry & Biobehavioral Sciences; Director, Semel Institute for Neuroscience and Human Behavior, UCLA

Session 1 Chair: Robert M. Bilder, PhD., Department of Psychiatry & Biobehavioral Sciences, University of California, Los Angeles

*Research Maps for Integrating and Planning Experiments in Neuroscience*

Alcino J. Silva, Ph.D., Departments of Neurobiology, Psychiatry & Biobehavioral Sciences, and Psychology, University of California, Los Angeles

*Linking Knowledge and Reproducible Research Via Standardized Provenance Models*

Satrajit Ghosh, Ph.D., McGovern Institute for Brain Research, Massachusetts Institute of Technology, Cambridge

*Cognitive Computing in Healthcare*

Martin S. Kohn, Ph.D., Chief Medical Scientist, Jointly Health, San Juan Capistrano, California

*Building a Breakthrough Machine for the Brain (will most likely change closer to event)*

Gully Burns, Ph.D., Biomedical Knowledge Engineering Group, Intelligent Systems Division, Information Sciences Institute, University of Southern California, Los Angeles

Session 2 Chair: John Bickle, Ph.D., Department of Philosophy, Mississippi State University

*How Do We Know What We Don't Know: The Use of Neuroscience Information Framework to Reveal Knowledge Gaps*

Maryann Martone, Ph.D., Director, Neuroscience Information Network, University of California, San Diego

*Big Data Analyses of Etiology of Complex Disease*

Andrey Rzhetsky, Ph.D., Department of Medicine and Human Genetics, Institute for Genomics and Systems Biology, and Computation Institute, University of Chicago, Illinois

*Big Data Analytics in Science*

Wei Wang, Ph.D., Computer Science Department, University of California, Los Angeles

*Integrating Experimental Results for Casual Discovery*

Frederick Eberhardt, Ph.D., Department of Philosophy, California Institute of Technology, Pasadena, California

### **The 8th Annual Neural Microcircuits Training Program Symposium, “Dynamics of Neural Microcircuits”**

The 8th Annual Neural Microcircuits Training Program Symposium, “Dynamics of Neural Microcircuits” was held on May 8, 2014. The symposium was sponsored by the UCLA Department of Neurobiology, and the UCLA Brain Research Institute.

#### Symposium Schedule

Session 1 - Tad Blair, Chair

Introduction

Jack Feldman - UCLA

NIH Update

Steven Korn - NIH

*Touch Circuits in the Spinal Cord*

Martyn Goulding - SALK

*Cellular Mechanisms Underlying Spontaneous Patterned Activity in Developing Retinal Circuits*

Marla Feller - UCB

Session 2 - Alex Reeves, Chair

*Molecular and Functional Characterization of the Respiratory Motor Circuit*

Albert Han - UCLA

*Making Choices: From Circuits to Behavior*

Michele Basso - UCLA

Session 3 - Carlos Portera-Cailliau, Chair

*More Than a Rhythm of Life: Breathing as the Master Clock for Orofacial Sensorimotor Control*

David Kleinfeld - UCSD

*Remapping in Parietal Cortex and Spatial Stability*

James Bisley - UCLA

Session 4 - Michele Basso, Chair

*Bistable Effect of Ubiquitination on Synaptic Function and Plasticity*

Katherine Myers - UCLA

*The Basal Ganglia Orchestrate the Activity in Downstream Microcircuits - A Vertebrate Perspective*

Sten Grillner - KAROLINSKA

## **Steroids, Genes and the Brain: A New Dogma - A Symposium of the Laboratory of Neuroendocrinology**

The Laboratory of Neuroendocrinology at UCLA hosted a full-day symposium, "Steroids, Genes and the Brain: A New Dogma," on May 23, 2014. The organizing committee gratefully acknowledged support from the UCLA Brain Research Institute, the Departments of Neurobiology, and Integrative Biology & Physiology at UCLA, and the Doris Duke Charitable Foundation.

The Laboratory of Neuroendocrinology (LNE) is a unit of the UCLA Brain Research Institute comprising 14 faculty laboratories with a common interest in neuroendocrinology, sex differences, and reproduction. The LNE fosters education and collaborative research in neuroendocrinology and sex differences, especially in areas concerning reproduction and disease. The activities of the LNE include graduate and undergraduate courses in neuroendocrinology, the weekly brown-bag seminar on current topics in neuroendocrinology, active research collaboration among labs, opportunities for students at all levels, and the annual Charles Sawyer lectureship in neuroendocrinology.

The educational activities of the LNE have been funded continuously since 1980 by an NIH training grant, "Neuroendocrinology, Sex Differences, and Reproduction." Research of the faculty spans all analytical levels, from the molecular to the behavioral. Research interests include sex determination and sexual differentiation, hormonal regulation of neural function, gender differences in disease, cellular and molecular analysis of neural development, circadian rhythms, neural regulation of gonadal and adrenal function, glial neurobiology, stress, aging, neuroendocrine immunology, molecular genetics of the sex chromosomes, and genetic approaches. Although the main focus is on basic research in neuroendocrinology, some faculty are also involved in direct analysis of human disease and clinical trials to develop new neuroendocrine therapies.

### Symposium Schedule

Welcome & Introduction:

Paul Micevych, Professor, Department of Neurobiology, David Geffen School of Medicine, UCLA

#### Session 1:

*"Hormonal Regulation of Plasticity in the Adult Avian Song Control System"*

Eliot Brenowitz, Professor, Departments of Biology and Psychology, University of Washington

*"Genomic Integration of Perceptual and Social Experience in Songbirds"*

David Clayton, Professor of Neuroscience, Head of Psychology Division, Queen Mary University of London

#### Session 2:

*"Neuroendocrine Control of Athleticism: Lessons from an Exuberant Tropical Bird"*

Barney Schlinger, Professor and Chair, Department of Integrative Biology & Physiology, UCLA

*"Estradiol Membrane-Initiated Signaling: Reproduction and Beyond"*

Paul Micevych, Professor, Department of Neurobiology, David Geffen School of Medicine, UCLA

#### Session 3:

Presentations by LNE Trainees

Nancy Day (White Lab):

Brian Parks (Lusis Lab): "Identification of Sex-Specific Genetic Loci Associated with Metabolic Traits in the Mouse"

Sienmi Du (Voskuhl Lab): "Sex Chromosomes and the CNS Response to Injury"

#### Session 4:

*"Does this Chromosome Make Me Look Fat?"*

Karen Reue, Professor, Department of Human Genetics, David Geffen School of Medicine, UCLA

*"Role of Sex Chromosome in Cardioprotection"*

Mansoureh Eghbali, Associate Professor, Department of Anesthesiology, David Geffen School of Medicine, UCLA

*"Sex, Food Intake, Growth Hormone and the Four Core Genotypes"*

Emilie Rissman, Professor, Department of Biochemistry and Molecular Genetics, University of Virginia



Plenary Lecture:

*"The Medical Importance of Sexual Differentiation Theory, or How a Half-Male Half-Female Bird Changed My Mind About Metabolic, Autoimmune, and Cardiovascular Disease"*

Arthur P. Arnold, Distinguished Professor, Department of Integrative Biology and Physiology, UCLA

LNE Poster Session and Reception

**21st Annual Joint Symposium on Neural Computation**

In 1994, the Institute for Neural Computation at the University of California, San Diego hosted the first Joint Symposium on Neural Computation with the California Institute of Technology in Pasadena. The symposium brought together students and faculty for a day of short presentations. Since then, the symposium has rotated between UCSD, Caltech, UCI, UCLA, USC and UCR. This year, the 21<sup>st</sup> Annual Joint Symposium on Neural Computation was held at the University of California, Irvine on May 17, 2014.

Symposium Schedule

Welcome and Opening Remarks

Session 1

*Retrosplenial Cortex: Interface Between Cortical and Hippocampal Maps of Space*

Doug Nitz, University of California, San Diego

*Information, Motivation and Goal-Directed Choice*

Mimi Liljeholm, University of California, Irvine

*Brain Machine Interfaces*

Richard Andersen, California Institute of Technology

Keynote Speaker

*Computing with a Periodic Table of the Neurons*

Giorgio Ascoli, George Mason University

Poster Highlights and Poster Session

Session 2

*Robot-assisted Neurorehabilitation: Toward a Computational Approach*

Dave Reinkensmeyer, University of California, Irvine

*Where the Insect Brain and Machine Learning Connect: Neural Circuits for Pattern Recognition*

Ramon Huerta, University of California, San Diego

Poster Viewing

*Making Choices: From Behavior to Circuits*

Michele Basso, University of California, Los Angeles

*Synaptic Plasticity Enables Adaptive Self-Tuning Critical Networks*

Narayan Srinivasa, HRL Laboratories

*Engineering Memories: A Cognitive Neural Prosthesis for the Hippocampus*

Ted Berger, University of Southern California

## The Integrative Center for Learning and Memory

### 13<sup>th</sup> Annual Southern California Learning and Memory Symposium

The Thirteenth Annual Southern California Learning & Memory Symposium was held on June 2 2014. This symposium is a yearly meeting primarily for Southern California laboratories interested in plasticity and learning. This year's annual symposium was supported by the Brain Research Institute, and the David Geffen School of Medicine at UCLA.

#### Symposium Schedule

Welcome and Opening Remarks

Alcino J. Silva, Ph.D., Departments of Neurobiology, Psychiatry & Biobehavioral Sciences, and Psychology, University of California, Los Angeles

#### Session 1

Chair: Michael Fanselow, Ph.D., Departments of Psychology, and Psychiatry & Biobehavioral Sciences, UCLA

*Chromatin Dynamics Mediating Cocaine-Induced Behavioral and Molecular Plasticity*

Pamela Kennedy, Ph.D., Behavioral Neuroscience, Department of Psychology, UCLA

*Effects of Manipulating Theta Oscillations and Medial Entorhinal Cortex on Hippocampal Temporal and Spatial Coding*

Stefan Leutgeb, Ph.D., Section of Neurobiology, Division of Biological Sciences, UCSD

*Unraveling Synaptic Connectivity from Ensemble Recordings*

Bruce McNaughton, Ph.D., Department of Neurobiology & Behavior, UCI

#### Session 2

Chair: Carrie Bearden, Ph.D., Department of Psychiatry & Biobehavioral Sciences, UCLA

*Effects of Modern-Life stress on Memory: Mechanisms and Molecules*

Tallie Z. Baram, M.D., Ph.D., Danette Shepard Professor of Neurological Sciences; Professor of Pediatrics, Anatomy/Neurobiology, Neurology, Physiology and Biophysics; Founder and Director, UCI Epilepsy Research Center, UCI

*Cognitive Networks and the Noisy Brain*

Bradley Voytek, Ph.D., Department of Cognitive Science, Neurosciences Graduate Program, Institute for Neural Computation, UCSD

*Plasticity Balance, the Sheldon Mouse, and Alzheimer's Disease*

Dale Bredeesen, M.D., Augustus Rose Professor of Neurology; Director, Mary S. Easton Center for Alzheimer's Disease Research, UCLA

#### Session 3

Chair: David Glanzman, Ph.D., Departments of Integrative Biology & Physiology, and Neurobiology, UCLA

*Pattern Separation Beyond the Hippocampus: A Role for Medial Temporal Cortices*

Michael Yassa, Ph.D., Department of Neurobiology & Behavior, UCI

*Fronto-Basal-Ganglia Circuits for Stopping Action in Humans*

Adam Aron, Ph.D., Department of Psychology, UCSD

*There is a Time and a Place for the Dentate Gyrus*

Andrea Chiba, Ph.D., Department of Cognitive Science, UCSD

#### Session 4

Chair: Alicia Izquierdo, Ph.D., Department of Psychology, UCLA

*Genes and Mechanisms that Orchestrate the Homeostatic Modulation of Synaptic Strength*

Dion Dickman, Ph.D., Department of Neurobiology, University of Southern California

*Central Circuits Underlying Olfaction*

Jeffrey S. Isaacson, Ph.D., Department of Neuroscience, School of Medicine, UCSD

*Interneurons: Pieces of the Puzzle Alois Never Mentioned*

Istvan Mody, Ph.D., Tony Coelho Professor of Neurology, and Professor of Physiology, UCLA

## CAROL MOSS SPIVAK CELL IMAGING FACILITY

In March 2008, the BRI Cell Imaging Facility moved to the California Nanosystems Institute (CNSI) to join with the CNSI Advanced Light Microscopy Facility. The joined facility has since served over 1400 users representing over 250 labs at UCLA, LABioMed, Harbor-UCLA and Cedars Sinai Health Center as well as several industry laboratories (e.g. Nestlé, NanoH2O, Sonendo Inc., Agensys Inc.). The facility houses five Leica spectral confocal microscopes, three of which have multiphoton laser scanning ability. The facility now has a Spinning Disk Confocal Microscope, a Laser Microdissection System and will soon have a TIRF (Total Internal Reflectance) Microscope online. Additional techniques now available include: FRET (fluorescence resonance energy transfer) FLIM (fluorescence lifetime imaging), FRAP (fluorescence recovery after photobleaching) and STED (scanning transmission depletion microscopy, which allows imaging below the diffraction limit of normal light resolution) and spectral unmixing both on microscopic and macroscopic (small animal) imaging scales. Dr. Laurent Bentolila is the scientific director of the facility.

Dr. Matt Schibler, former director of the BRI Cell Imaging Facility and now a Microscopy Staff Scientist in the combined CNSI/BRI Advanced Light Microscopy/Spectroscopy Facility, has primary responsibility for training new users in the facility and has taught over 200 individuals (in groups of 3-7) how to use the joined facility's confocal microscopes and other instruments. Training sessions are held on the average of once every ten days depending on demand. Each confocal microscopy training session includes three hours of confocal microscope theory and instruction in the use of the microscope software. Dr. Schibler also continues instruction for all of these users beyond the initial class. Dr. Schibler has been a member of UCLA's Laser Safety committee responsible for reviewing and setting laser safety policy at UCLA. Dr. Schibler also coordinates the collection of images for the annual BRI calendar.

The combined facility has hosted several tours during the current period which included students from local colleges (such as College of the Canyons and El Camino College), and UCLA class groups in electrical engineering, microscopy and microbiology as well as industry leaders in nanotechnology and members of committees and delegations from programs for neuroscience, nanoscience and nanotechnology.

The facility also acts as a bridge between UCLA researchers and the vendors of imaging technologies and assists vendors with space and coordination for workshops and presentations for the benefit of UCLA researchers.

## INTEGRATIVE CENTERS FOR NEUROSCIENCE EXCELLENCE (ICNE)

The launch of six new Integrative Centers for Neuroscience Excellence (ICNE) will bring different areas of research excellence into the forefront and highlight the specific strengths of UCLA's neuroscience activities. The UCLA neuroscience community is very large, and research is conducted within a number of schools, institutes, departments and organized research units (ORUs) which can make it difficult to envision how all the components contribute to the whole. The ICNE, by giving an institutional "face" to different areas of neuroscience, will remedy this situation by providing a focused profile highlighting the diverse activities of the neuroscience community to potential students and the public. The proposed ICNE represent communities of scientists who share an interest in similar topics or techniques, and correspond roughly to the focused areas of research (FARs) that guide curriculum options for the Interdepartmental Ph.D. Program for Neuroscience. Each ICNE will develop its own identity. Each will have its own website, and receive endowment support to organize symposia and seminars, as well as facilitate coordination and cooperation in its particular field. There are six Integrative Centers for Neuroscience Excellence. Two ICNE have launched (the Integrative Center for Learning and Memory, and the Integrative Center for Neurogenetics) and four are in the process of development. The next center to be launched will be the Integrative Center for Neural Repair and will represent research concentrations in neural development, degeneration and repair. Future ICNE will be concentrated on neuroimaging, synapses, cells and circuits, and addiction neurobiology.

## AFFINITY GROUPS (\*upcoming ICNE)

A variety of interdisciplinary affinity groups, developed to provide scientific exchange on specific research topics, meet at regular intervals. A number of these groups have developed program project, center, and training grant proposals. These groups represent one of the greatest strengths of the Institute; the scientific depth and diversity of its membership, and their collaborative interaction. These affinity groups include:

<u>Affinity Group</u>	<u>Leader(s)</u>
Addictions Research Consortium*	Edythe London & Igor Spigelman
Astrocyte Biology	Baljit Khakh & Michael Sofroniew
Autism	Daniel Geschwind
Brain-Mind-Body Interactions	Michael Irwin
Brain Tumor Affinity Group	Linda Liau and Robert Prins
Circadian and Sleep Medicine	Christopher Colwell
Computational Neuroscience	Ladan Shams
Immunology in Neuroscience	James Waschek
Inner Ear	Felix Schweizer
Neural Repair*	Marie-Françoise Chesselet
Neural Stem Cells	Harley Kornblum
Neurobiology of <i>Drosophila melanogaster</i> and <i>C. Elegans</i>	David Krantz
Neuroendocrinology	Arthur Arnold
Neuroimaging/Cognition*	Susan Bookheimer
Neuronuclear Imaging Affinity Group	Daniel Silverman
Neurophysics & Neuroengineering	Mayank Mehta
Neuroscience History	Joel Braslow & Russell Johnson
Songbird	Stephanie White
Stress, Pain and Emotion	Emeran Mayer
Synapse to Circuit Club*	Kelsey Martin & Larry Zipursky
Undergraduate Researchers in Parkinson's Disease	Marie-Françoise Chesselet
Zebra Fish	Alvaro Sagasti

## **SCIENTIFIC and EDUCATIONAL OUTREACH PROGRAMS**

### **Brain Awareness Week March 2014**

**(Held in conjunction with the Society for Neuroscience Brain Awareness Week)**

The UCLA Chapter of the Society for Neuroscience recognized Brain Awareness Week (BAW) with a number of special events during a busy, educational and exciting week at the UCLA Brain Research Institute (BRI).

The focus of BAW is “Community-to-Campus Outreach,” bringing nearly 300 students from Los Angeles area middle schools and high schools to the UCLA Brain Research Institute (BRI). This program provides students the opportunity to visit the UCLA BRI and participate in neuroscience educational activities, lab and campus tours, and career/mentoring workshops. With over 50 faculty and student volunteers from numerous groups (Project Brainstorm, Interaxon, STEMPLEDGE, Neuroscience Undergraduate Society) full-day events included brain demonstrations, hands-on activities and presentations, lab tours, campus tours, and career/mentorship workshops.

During Brain Awareness Week, a number of teachers from local schools are invited to bring their class on a very special field trip to the UCLA Brain Research Institute. Each day, visiting students arrived in front of the Gonda (Goldschmied) Neuroscience and Genetics Research Center to join “Project Brainstorm” leader, Nicholas Hardy. (Project Brainstorm is the ongoing science outreach program organized by graduate students in the Interdisciplinary Program for Neuroscience at UCLA.) The tour began with a brief overview on the structure and function of the brain, and then graduate students from Project Brainstorm conducted presentations on the brain, including some hands-on activities, and educational, age-appropriate presentations ranging from brain injury, two-point discrimination testing, sensation, synaptic function, hemispheric differences, motor system and lobe functions set up by the Interaxon group. The students then visited research laboratories in the Gonda Center where they heard presentations about a number of research topics. The day concluded with a campus tour, and a career/mentoring workshop. In the morning session the goal was to inspire excitement and educate our youth audience, specifically focusing on neuroscience hands-on activities. In the afternoon session, the campus tour had two benefits: 1) Introduce K-12 students to the UCLA campus, and 2) Expose students to the ethnic diversity of the UCLA community. In the career/mentoring panels students had the opportunity to meet a diverse graduate student panel. Graduate students from multiple ethnic and socioeconomic backgrounds described their personal paths to graduate education, and the hardships and successes they have experienced. Students expressed a lot of curiosity, insight, and interest throughout the entire day while being guided through the fascinating neuroscience research environment at UCLA. Before departing, the students all received a Brain Research Institute pencil and brain eraser as souvenirs of their visit to UCLA. This year, our BAW was sponsored by the UCLA Brain Research Institute, Campus Programs Committee, and the Graduate Student Association’s Discretionary Funds.

### **Project Brainstorm**

Project Brainstorm is the current outreach project of the Brain Research Institute and the Interdepartmental Graduate Program for Neuroscience. Project Brainstorm grew out of the former SPARCS (Special Achievement Rewards for College Scholars) Program that was developed by Dr. Arnold Scheibel and Ms. Norma Bowles of the ARCS Foundation (Achievement Rewards for College Scientists).

The goal of Project Brainstorm is to stimulate interest in science for children and young adults by emphasizing the function and importance of the brain. Students in the Interdepartmental Graduate and Undergraduate Neuroscience Programs devote a great deal of time to this outreach program. Teams of graduate and undergraduate students participate in the program and visit private and public schools in the Los Angeles area throughout the academic year. On a typical visit, a team of two predoctoral and two undergraduate students teach two classrooms of students at the elementary level. Through group participation, interactive games, and hands-on exercises, the young students receive instruction in the basic science of the

brain. With each visit, new techniques and strategies are learned for effectively reaching the children. Topics such as "What does the brain do? What is it made of? Does size matter? Are there sex differences in brains? What happens as your brain grows? What is good for your brain? and What is bad for your brain?" ~ are all topics the children love to explore. The teaching teams often get some surprisingly accurate answers from even the first- and second-graders!

Project Brainstorm participants carry a combined body of knowledge into the classroom with a few teaching props, a plastic model of the brain, one or two real human brains, skulls, and a spinal cord, and a few animal brains for comparison. The children respond with enthusiasm and show a great deal of interest in the brain. Hopefully this interest will survive, be nurtured, and grow until the children are able to pursue an educational path that will lead them to careers in science.

### **Interaxon**

Interaxon is an Undergraduate Neuroscience Educational Outreach Group founded at UCLA (<http://Interaxon.scienceontheweb.net>) and affiliated with the BRI. Interaxon was founded in 2006 by Shanna Fang, who was among the first group of students to take the NS195 Project Brainstorm course. Interaxon has grown and now consists of 30 or more members from freshmen to seniors, as well as some alumni, from a wide variety of majors encompassing not only the sciences (neuroscience, biology, integrative biology & physiology, molecular & cell biology) but also economics, philosophy, foreign language, and international development. Interaxon has been a huge success in the Los Angeles area, reaching out to a large number of 1st-12th grade student groups with as many as 6 presentations per quarter to as many as 150 students in a single visit to a school. Interaxon meets weekly to schedule their activities and practice their presentations for upcoming venues. They use approaches such as stations, brain models, props to talk about the brain in a simple way, as is done in Project Brainstorm, but with more senior graduate students and faculty supervising when human brains are shown. Interaxon excels in developing novel interactive games such as "Pirates of the Crrrrrranium." Presentations have included: Human/Animal Brain Lab, Lobe Functions, Sensory Systems, Neurons/Neurotransmitters, Brain Injury, Learning and Memory, Neurological Disorders, Effects of Drugs on the Brain, and Alcohol and the Brain. Interaxon also holds career panels for high school students to encourage them to pursue higher education and interests towards careers in science and medicine.

Interaxon made numerous presentations during the 2013-2014 academic year. Venues included: Project Bruin, Brain Awareness Week (in collaboration with Project Brainstorm), our first Science Day outreach event (with guest presentations by Alpha Chi Sigma and Baja Racing), hosting a neuroscience fair for Hawthorne Math and Science Academy students, the Brain Bee, and numerous outreach visits to schools within the Los Angeles United School District.

### **New Initiatives**

#### **NeuroCamp**

NeuroCamp was initiated in the summer of 2010. NeuroCamp invites students, drawn mainly from local high schools, to enjoy a crash course of lectures and hands-on exercises covering many aspects of the fundamentals of neuroscience. Students spend several hours attending lectures by UCLA professors and mastering a wide variety of laboratory techniques crucial to modern science. This intensive two-week course exposes students to the basics of neuroanatomy and molecular biology.

NeuroCamp is the brainchild of Dr. Joe Watson, the BRI's former Associate Director for Outreach. Students intern in UCLA neuroscience labs for two weeks and meet every afternoon in a teaching lab in Franz Hall for instruction from Drs. Volkan Coskun, Jack Van Horn and Wendy Walwyn. Dr. Watson, and Associate Director for Outreach, Dr. Ellen Carpenter, have expanded NeuroCamp, each year enrolling more students from schools in disadvantaged areas. For more information, please see: [http://www.bri.ucla.edu/bri\\_education/scienceoutreach.asp](http://www.bri.ucla.edu/bri_education/scienceoutreach.asp).

### **Science Fairs and Competitions**

The BRI Outreach Program also sponsors science fairs off campus at local high schools and also at the state level. The BRI sponsors prizes at the Annual California State Science Fair, awarding multiple Neuroscience prizes for both the senior (grades 9-12) and junior (grades 6-8) levels. The BRI also sponsors prizes at the Los Angeles County Science Fair, and co-sponsors the LA BRAIN BEE (<http://www.losangelesbrainbee.com>). During the summer the BRI also places as many as 20 local high school students in research labs in the UCLA neuroscience community. The BRI also sponsors winners of local high school fairs as part of the Summer Internship Program.

**NEUROSCIENCE NEWS**, the BRI's newsletter, provides a quarterly update on Institute news and events, including new members in the BRI, and graduate students in the Interdepartmental Program for Neuroscience, fellowships and awards currently available, and laboratory personnel and positions available in the UCLA neuroscience community.

**UCLA NEUROSCIENCE RESEARCH SEMINARS AND LECTURES** calendar is published bi-monthly and is a summary of all neuroscience-related lectures and activities on the entire campus.

**BRI ANNUAL NEUROSCIENCE CALENDAR** includes major national and international neuroscience conferences as well as UCLA neuroscience events throughout the year.





## BRAIN RESEARCH INSTITUTE FUNDING

### STATISTICAL DATA

1.	Number of Graduate and Postdoctoral Students Directly Contributing to BRI's Work	
(a)	Who are on payroll	0
(b)	Who participate through assistantships, traineeships, fellowships or otherwise	
(1)	BRI fellowships from ARCS Predoctoral	6
(2)	Interdepartmental Ph.D. Program in Neuroscience (including fellowships from ARCS)	
	Candidates for Ph.D.	83
	Candidates for M.D.-Ph.D.	14
(c)	Total number of graduate and postdoctoral students under supervision of BRI members	
(1)	Predoctoral	319
(2)	Postdoctoral	308
2.	Number of Faculty Members Actively Engaged in BRI's Research or Its Supervision	
	Total number of members	339
	Regular members	264
	Emeritus members	66
	Corresponding members	9
3.	Extent of Faculty Participation from Other Campuses	0
4.	Number of FTEs of Professional, Technical, Administrative, and Clerical Personnel Employed	
(a)	Positions supported by grants and contracts administered by the BRI	
(1)	Academic	0
(2)	Non-academic (administrative, technical, and clerical)	0
(3)	Total	0
(b)	Positions supported by UC 19900 budget	
(1)	Academic	0.18
(2)	Non-academic	4.35
(3)	Total	4.43

5. List of Publications Issued by the BRI
  - (a) Publications of individual members and BRI affiliates and programs (1200)
  - (b) BRI Annual Report  
(30 copies distributed free of charge)
  - (c) Joint Seminars in Neuroscience flyers  
(E-mail distribution only)
  - (d) UCLA Neuroscience Research Seminars and Lectures 2013 #13-21; 2014 #1-12  
(E-mail distribution only)
  - (e) Neuroscience News Vol. 22, # 1, Fall 2013/Winter 2014; Vol. 22 # 2, Spring/Summer 2014  
(E-mail distribution and limited mailings (development, alumni, etc.)
  - (f) BRI Annual Calendar  
(Distribution to the neuroscience community, donors and guest speakers)

## RESEARCH AND TRAINING SUPPORT

Substantial support continued to be provided from the ARCS Foundation (Achievement Rewards for College Scientists) for scholarships given to a number of talented graduate students in neuroscience.

Evidence of a broadening base was also apparent in efforts to acquire additional funds for the endowment, the nucleus of which was formed by the Leslie Fund in 1974. The BRI continues to aim at achieving a large stabilizing fund in order to assure the potential productivity of which it is capable.

The amount and sources of extramural funding administered by the BRI are listed in the table below. These figures do not include gift and endowment principal. BRI members have additional research funding administered through their home departments.

### Brain Research Institute Contracts & Grants Administration Sources of Extramural Financial Support 2013-2014

Agency	Title	Total Direct Cost	Principal Investigator
National Institutes of Health			
National Institute of Child Health & Human Development HD-07228	Training Program in Neuroendocrinology, Sex Differences, and Reproduction	\$282,258	A. Arnold (Life Sciences)
National Institute of Neurological Disorders & Stroke NS07449	Training Program in Neural Repair	\$160,120	M. Chesselet (Neurology)
NS-07101	Cellular Neurobiology Training Program	\$194,656	T. O'Dell (Physiology)
National Institute of General Medical Sciences GM 75776	Clinical Pharmacology Training	\$250,120	B. Levey (Pharmacology)
Federal		\$887,154	
Total Funding Administered Through BRI		\$887,154	

## PUBLICATIONS

BRI Members' Total Number of Peer Reviewed Publications: 1200.

Total Number of Collaborative Publications with one or more BRI Member: 446.

To view publications by member please search PubMed at: <http://www.ncbi.nlm.nih.gov/pubmed/>.