BRAIN MAPPING
July 8 - 14 (Lecture Course)
John Mazzotta, UCLA School of Medicine
Arthur Toga, UCLA School of Medicine
The aim of this lecture course is to describe the rapidly evolving developments in brain mapping that have been applied to the problem of mapping the structure and function of the brain, both to understand its normal functional anatomy and to unravel pathological, neurodegenerative, and psychiatric disease states. This course describes new methods as well as the application of traditional techniques to unravelling the structural and functional anatomy of the brain. Methodologies that will be discussed include magnetic resonance imaging (including functional, spectroscopic and angiographic approaches), positron emission tomography (PET), single photon emission computed tomography (SPECT), optical intrinsic signal imaging, digital approaches to conventional post-mortem neuroanatomical investigations, data analysis statistical, structural approaches, visualization and stereotaxy. The course is not designed to simply describe methods, but rather to discuss how brain mapping strategies can be employed in combination with biological models for understanding the structure and function of the brain. Findings relevant to the function of the visual, motor, language, memory and cognitive brain systems, as well as diseases that affect them, will be discussed. Specific hypotheses and experimental designs will be developed by the students for mock experiments, or as an actual experiment if a field for an imaging laboratory can be arranged. Invited speakers will include world leaders in each of the respective brain mapping sub-specialties.

SUMMER - THIRD SESSION COURSES
EUKARYOTIC GENES EXPRESSION
July 23 - August 12
Michael Current, UCLA School of Medicine
Grace Gill, Harvard Medical School
David Gilmour, Pennsylvania State University
Stephen Smale, UCLA School of Medicine
The rapid cloning of eukaryotic promoters and regulatory factors has led to a dramatic increase in studies of gene regulation. The Eukaryotic Gene Expression course, designed for students, postdocs, and professors who have recently ventured into this dynamic area of contemporary biology, will cover topics on state-of-the-art techniques and strategies for the study of gene expression, with special emphasis on transcriptional regulation. Students will be instructed in the execution of in vivo transcription in yeast and extracts and by transfection of mammalian tissue culture cells. Analytical techniques for measuring gene expression will include primer extension and nucleic acid protection measurements of mRNAs, and enzymatic analyses of reporter proteins.

YEAST GENETICS
July 23 - August 12
Alison Adams, University of Arizona, Tucson
Gunnar de Groot, Fred Hutchinson Cancer Research Center
Tim Stearns, Stanford University
The major laboratory techniques used in the genetic analysis of yeast will be studied, including the isolation and characterization of yeast gene disruptions, complementation, and mitotic recombination. Micromanipulation used in tetrad analysis will be covered by all students. Molecular genetic techniques, including yeast transformation, gene replacement, analysis of gene fusions, and generation of mutations in cloned genes, will be studied. Direct immunofluorescence experiments will be done to identify the nucleus, microtubules, and other cellular components. Lectures on fundamental aspects of yeast genetics will be presented along with seminars given by outside speakers on topics of current interest.

THE BIOLOGY OF MEMORY: FROM MOLECULES TO BEHAVIOR
July 18 - 31 (Lecture Course)
Jack Byrne, University of Texas Medical School, Houston
Howard Eichenbaum, Harvard Medical School
Keir Pearson, University of Alberta, Canada
Larry Squire, University of California, San Diego
This lecture course provides an introduction to cell, molecular, and systems approaches to learning and memory. It is suited for graduate students in molecular biology, neurobiology, and psychology as well as research workers who are interested in an introduction to this field. The course will cover topics ranging from behavioral considerations of learning and memory to gene regulation in the nervous system. The lectures provide an in-depth coverage of six selected areas: 1) an introduction to modern behavioral studies of learning and memory; 2) an overview of the cell biology of neuronal plasticity and second messenger systems; 3) the regulation of gene expression; 4) cellular and molecular mechanisms of simple forms of learning and memory in invertebrates and vertebrates; 5) cellular and molecular mechanisms of long-term potentiation and depression in various regions of the mammalian brain; 6) systems approaches to learning in vertebrates and humans.

NEUROBIOLOGY OF HUMAN NEUROLOGICAL DISEASE: Mechanisms of Neurodegeneration
August 4 - 10 (Lecture Course)
Sam Gandy, Cornell University Medical College
Sangram Sisodia, John Hopkins University School of Medicine
How and why do neurons die in specific acute or chronic human neurological disorders? What are the molecular and biochemical manifestations of specific genetic lesions in specific neurodegenerative disorders? Do different pathological mechanisms share common mechanisms? What practical treatments can be contemplated? This lecture course will explore possible answers to these important questions. Recent advances in neurogenetics and molecular and cell biology have begun to shed light on the mechanisms that underly nervous system injury in disease states such as Alzheimer’s disease, amyotrophic lateral sclerosis, prion diseases, Huntington’s disease, epilepsy and stroke. Taking advantage of small class size and extensive discussion, invited faculty lecturers will examine critical issues in their areas of expertise. Overview will be provided and course participants need not have familiarity with neurological diseases. The course will focus primarily on four specific hypotheses and approaches driving current research. Emphasis will be placed on the highly dynamic interface between basic and clinical investigation, including the interdependence of clinical research and disease model development. The value of disease research in understanding the function of the normal nervous system.

FALL COURSES
ADVANCED IN SITU HYBRIDIZATION & IMMUNOCHEMISTRY
October 14 - 27
John Murray, Robert Ochs, Thomas Ried, David Spector
MACROMOLECULAR CRYSTALLOGRAPHY
October 14 - 27
Walter Ira, Gary Gilliland, Alexander McPherson, James Pfuglath
POSITIONAL CLONING: CONTIG TO CANDIDATE GENE
October 14 - 27
Carmen Puente, Gary Silverman
MOLECULAR AND CELL BIOLOGY OF S. POMBE & OTHER YEASTS
November 4 - 17
Tom Chappell, Paul Young
MOUSE BEHAVIORAL ANALYSIS
November 4 - 17
Instructors to be announced
PHAGE DISPLAY OF COMBINATORIAL ANTIBODY LIBRARIES
November 4 - 17
Carlo Barbui, Dennis Burton, Gregg Silverman
COMPUTATIONAL GENOMICS
November 6 - 11
William Pearson, Randall Smith

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