

# Molecular Biology

## Faculty

Greg L. Harris, Ph.D., Professor of Biology  
(Molecular Biology Institute Director)  
Sanford I. Bernstein, Ph.D., Albert W. Johnson Distinguished  
Professor of Biology  
Kelly S. Doran, Ph.D., Professor of Biology  
(Graduate Adviser, Molecular Biology)  
Christopher C. Glembotski, Ph.D., Professor of Biology  
Tom Huxford, Ph.D., Professor of Chemistry and Biochemistry  
Scott T. Kelley, Ph.D., Professor of Biology  
Stanley R. Maloy, Ph.D., Professor of Biology and  
Dean of the College of Sciences  
Kathleen L. McGuire, Ph.D., Professor of Biology  
Penelope J.E. (Jenny) Quintana, Ph.D., Professor of Public Health  
Forest L. Rohwer, Ph.D., Professor of Biology  
Anca Mara Segall, Ph.D., Professor of Biology  
Mark A. Sussman, Ph.D., Albert W. Johnson Distinguished Professor  
of Biology  
Elizabeth R. Waters, Ph.D., Professor of Biology  
Roland Wolkowicz, Ph.D., Professor of Biology  
Robert W. Zeller, Ph.D., Professor of Biology  
(Graduate Adviser, M.A./M.S. Programs)  
Ralph Feuer, Ph.D., Associate Professor of Biology  
John J. Love, Ph.D., Associate Professor of Chemistry and  
Biochemistry  
Peter van der Geer, Ph.D., Associate Professor of Chemistry and  
Biochemistry  
Ricardo Zayas, Ph.D., Associate Professor of Biology

## Adjunct Faculty

Piero Anversa, M.D., Harvard Medical School  
Jeremy Barr, Ph.D., San Diego State University  
Michael Buchmeier, Ph.D., University of California, Irvine  
Alex Burgin, Ph.D., Emerald Biostructures  
Maurizio C. Capogrossi, M.D., L'Istituto Dermatologico dell'Immacolata  
(IDI - IRCCS)  
Karen Clingerman, D.V.M., The Scripps Research Institute  
Thomas Cujec, Ph.D., Eli Lilly  
Adrienne Dubin, Ph.D., The Scripps Research Institute  
Kim Finley, Ph.D., SDSU Donald P. Shiley BioScience Center  
Roger Allyn Forsyth, Ph.D., San Diego State University  
Natalie Gude, Ph.D., San Diego State University  
Deron Herr, Ph.D., National University of Singapore  
Valentine Lance, Ph.D., San Diego State University  
Phyllis-Jean Linton, Ph.D., SDSU Donald P. Shiley BioScience Center  
Patrick McDonough, Ph.D., Vala Sciences, Inc.  
Aram Meghghian, Ph.D., University of Padova  
Girish Melkani, Ph.D., San Diego State University  
John Mokili, Ph.D., San Diego State University  
Brett Monia, Ph.D., Isis Pharmaceuticals, Inc.  
James W. Neel, Ph.D., San Diego State University  
Kent Osborn, Ph.D., San Diego State University  
Joy A. Phillips, Ph.D., SDSU Donald P. Shiley BioScience Center  
Clemencia Pinilla, Ph.D., Torrey Pines Research Institute  
Harry H. Plymale, D.V.M., San Diego State University  
Coralie Poizat, Ph.D., King Faisal Specialist Hospital & Research  
Centre in Riyadh  
Moselio Schaechter, Ph.D., San Diego State University/University of  
California, San Diego  
Marilyn Thoman, Ph.D., SDSU Donald P. Shiley BioScience Center  
John D. Trawick, Ph.D., San Diego State Institute  
Mirko Volkers, M.D., San Diego State University  
Gregor Zlokarnik, Ph.D., Vertex Pharmaceuticals

## General Information

The Molecular Biology Institute (MBI) administers the Master of Arts and Master of Science degrees in biology with a concentration in molecular biology. The MBI is currently composed of members from the Departments of Biology, Chemistry and Biochemistry, and the Graduate School of Public Health, and is designed to serve these departments in the coordination, support, and enhancement of research and training in the molecular biological sciences. See Biology in this section of the bulletin for information on how to apply.

Graduate teaching associateships in biology and chemistry are available to qualified students. Application blanks and additional information may be obtained from the graduate coordinator of biology and are also available at <http://www.bio.sdsu.edu>.

## Admission to Graduate Study

Candidates for admission may come from a variety of disciplines in the biological and physical sciences. Ultimately, the research programs of individuals wishing to pursue master's degree work in molecular biology will be carried out under the supervision of MBI members.

In addition to the general requirements for admission to the university with classified graduate standing as described in Part Two of this bulletin, a student must satisfy the following admission requirements before being recommended for admission.

1. Possess a bachelor's degree with a major in a biological or physical science equivalent to that offered at San Diego State University.
2. Have a grade point average of 2.85 or better in work taken for the baccalaureate degree.
3. Meet biology departmental expectations on the GRE General Test.
4. Supply two letters of reference that describe the applicant's potential for graduate work.

Students who do not meet all of the above requirements for admission may be admitted with conditionally classified graduate standing upon the recommendation of the MBI faculty. Students so admitted will be advised as to the nature of their deficiency and the time allowed to achieve full classified graduate standing.

## Advancement to Candidacy

All students must satisfy the general requirements for advancement to candidacy, including the foreign language requirement for the master of arts degree, as stated in Part Four of this bulletin. Satisfactory progress on the thesis research will be prerequisite to obtaining departmental approval for advancement.

## Specific Requirements for the Master of Arts or Master of Science Degree

**(Major Code: 04161) (SIMS Code: M.A. 771459; M.S. 771458)**

In addition to meeting the requirements for classified graduate standing and the basic requirements for the master's degree as described in Part Four of this bulletin, the student must complete a graduate program of 30 units of 500-level and above courses selected, with the approval of the MBI graduate adviser. A list of suggested courses is presented on the following page. All students entering the Master of Science program in molecular biology will be required to take an advanced course in molecular biology. At least 15 units of the courses selected must be in 600- and 700-numbered courses including 799A, Thesis. The student must complete at least three units of Molecular Biology 601 and six units of Molecular Biology 610. With the approval of the graduate adviser of molecular biology, a student may substitute for Molecular Biology 610 another 600- or 700- numbered course. A final oral examination on the thesis will be administered by the thesis committee.

## Courses Acceptable for the Concentration in Molecular Biology (M BIO)

Refer to Courses and Curricula and Regulations of the Division of Graduate Affairs sections of this bulletin for explanation of the course numbering system, unit or credit hour, prerequisites, and related information.

### UPPER DIVISION COURSES

#### Biology (BIOL)

- BIOL 510. Molecular Evolution (3)  
 BIOL 549. Microbial Genetics and Physiology (3)  
 BIOL 554. Molecular Virology (3)  
 BIOL 556. Scanning Electron Microscopy Laboratory (2)  
 BIOL 557. Transmission Electron Microscopy Laboratory (3)  
 BIOL 567. Advanced Biochemistry, Cellular, and Molecular Biology (4)

- BIOL 568/  
 BIOMI 568. Bioinformatics (3)  
 BIOL 570. Neurobiology (3)  
 BIOL 575. Molecular Basis of Heart Disease (3)  
 BIOL 576. Developmental Biology (3)  
 BIOL 584. Medical Microbiology (3)  
 BIOL 585. Cellular and Molecular Immunology (3)  
 BIOL 590. Physiology of Human Systems (4)  
 BIOL 596. Special Topics in Biology (1-4)  
 BIOL 597A. Univariate Statistical Methods in Biology (3)

#### Chemistry (CHEM)

- CHEM 510. Advanced Physical Chemistry (3)  
 CHEM 550. Instrumental Methods of Chemical Analysis (2)  
 CHEM 560. General Biochemistry (3)  
 CHEM 562. Intermediary Metabolism (2)  
 CHEM 563. Nucleic Acid Function and Protein Synthesis (2)  
 CHEM 564. Receptor Biochemistry and Protein Modification (2)  
 CHEM 567. Biochemistry Laboratory (3)  
 CHEM 596. Advanced Special Topics in Chemistry (1-3)

### GRADUATE COURSES

#### Biology (BIOL)

- BIOL 600. Seminar (1-3)  
 BIOL 696. Advanced Topics in Biology (1-3)  
 BIOL 797. Research (1-3) Cr/NC/RP  
 BIOL 798. Special Study (1-3) Cr/NC/RP

#### Chemistry (CHEM)

- CHEM 712. Chemical Kinetics (3)  
 CHEM 751. Separations Science (3)  
 CHEM 763. Cellular Regulation (2)  
 CHEM 790. Seminar (1-3)  
 CHEM 791. Research Seminar (1)  
 CHEM 792. Bibliography (1)  
 CHEM 797. Research (1-3) Cr/NC/RP  
 CHEM 798. Special Study (1-3) Cr/NC/RP

### GRADUATE COURSES

#### M BIO 600. Seminar in Molecular Biology (1-3)

Prerequisite: Consent of instructor.

Evaluation of current literature in molecular biology. May be repeated with new content. Maximum credit six units applicable to a master's degree.

#### M BIO 601. Colloquium in Molecular Biology Research (1) Cr/NC/RP

Recent research advances in selected areas of modern molecular biology presented by faculty of the Molecular Biology Institute and established outside investigators. May be repeated with new content. Open only to students admitted to the molecular biology program or by permission of the graduate adviser for molecular biology. Maximum credit six units, three of which are applicable to a master's degree.

#### M BIO 610. Advanced Topics in Molecular and Cell Biology (1-4)

Prerequisite: Graduate standing in a life or physical science.

Intensive study in specific areas of molecular and cell biology. May be repeated with new content. See *Class Schedule* for specific content. Maximum credit six units applicable to a master's degree.