

# Molecular Biology

## Faculty

**Greg L. Harris**, Ph.D., Professor of Biology, Director of the Molecular Biology Institute  
**Sanford I. Bernstein**, Ph.D., Albert W. Johnson Distinguished Professor of Biology, Emeritus  
**Richard M. Cripps**, Ph.D., Professor of Biology  
**Robert A. Edwards**, Ph.D., Professor of Biology  
**Christopher C. Glembotski**, Ph.D., Albert W. Johnson Distinguished Professor of Biology  
**Tom Huxford**, Ph.D., Professor of Chemistry and Biochemistry  
**Scott T. Kelley**, Ph.D., Professor of Biology (Graduate Adviser, Molecular Biology, M.S. Program)  
**Stanley R. Maloy**, Ph.D., Professor of Biology and Associate Vice President for Research and Innovation in Graduate and Research Affairs  
**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, Chair of Department  
**Ralph Feuer**, Ph.D., Associate Professor of Biology  
**Marina Kalyuzhnaya**, Ph.D., Associate Professor of Biology  
**John J. Love**, Ph.D., Associate Professor of Chemistry and Biochemistry  
**Manal A. Swairjo**, Ph.D., Associate Professor of Chemistry and Biochemistry  
**Peter van der Geer**, Ph.D., Associate Professor of Chemistry and Biochemistry  
**Ricardo M. Zayas**, Ph.D., Associate Professor of Biology (Graduate Adviser, Cell and Molecular Biology Ph.D. Program)  
**Carrie D. House**, Ph.D., Assistant Professor of Biology  
**Robert J. Lualien**, Ph.D., Assistant Professor of Biology  
**Dwayne R. Roach**, Ph.D., Assistant Professor of Biology  
**Nicholas J. Shikuma**, Ph.D., Assistant Professor of Biology  
**Christal D. Sohl**, Ph.D., Assistant Professor of Chemistry and Biochemistry

## Adjunct Faculty

**Jeremy Barr**, Ph.D., San Diego State University  
**Alex Burgin**, Ph.D., Emerald Biostructures  
**Maurizio C. Capogrossi**, M.D., L'Istituto Dermopatico 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  
**Phyllis-Jean Linton**, Ph.D., SDSU Donald P. Shiley BioScience Center  
**Aram Megighian**, Ph.D., University of Padova  
**Girish Melkani**, Ph.D., San Diego State University  
**James W. Neel**, Ph.D., San Diego State University, Emeritus  
**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  
**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 Volkens**, 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 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 567L	Biochemistry, Cellular, and Molecular Biology Laboratory II.....	2
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 589	Stem Cell and Regenerative Biology.....	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.