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# Molecular Biology

## Faculty

Greg L. Harris, Ph.D., Associate Professor of Biology  
(Molecular Biology Institute Director)  
Sanford I. Bernstein, Ph.D., Professor of Biology  
Richard L. Bizzoco, Ph.D., Professor of Biology  
Michael J. Breindl, Ph.D., Professor of Biology  
(Graduate Adviser)  
A. Stephen Dahms, Ph.D., Professor of Chemistry  
Roger A. Davis, Ph.D., Professor of Biology  
Terrence G. Frey, Ph.D., Professor of Biology (Graduate Adviser)  
Christopher C. Glembocki, Ph.D., Professor of Biology  
Barbara B. Hemmingsen, Ph.D., Professor of Biology  
Stanley Maloy, Ph.D., Professor of Biology  
Kathleen L. McGuire, Ph.D., Professor of Biology  
Robert P. Metzger, Ph.D., Professor of Chemistry  
Paul J. Paolini, Jr., Ph.D., Professor of Biology  
Jacques Perrault, Ph.D., Professor of Biology  
Roger A. Sabbadini, Ph.D., Professor of Biology  
William E. Stumph, Ph.D., Professor of Chemistry  
(Graduate Adviser)  
Mark A. Sussman, Ph.D., Professor of Biology  
Constantine Tsoukas, Ph.D., Professor of Biology  
P.J.E. (Jenny) Quintana, Ph.D., Associate Professor of Public Health  
Anca Mara Segall, Ph.D., Associate Professor of Biology  
Scott Kelley, Ph.D., Assistant Professor of Biology  
John J. Love, Ph.D., Assistant Professor of Chemistry  
Shelli R. McAlpine, Ph.D., Assistant Professor of Chemistry  
Robert W. Zeller, Ph.D., Assistant Professor of Biology

## Adjunct Faculty

Ashley J. Birkett, Ph.D., Apovia Incorporated  
Robert A. Bohrer, J.D., LL.M., California Western School of Law  
Stanley G. Bower, Ph.D., Kelco Biopolymers  
Stanley T. Croke, M.D., Ph.D., Isis Pharmaceuticals  
Martin Gore, Ph.D., Arena Pharmaceuticals, Inc.  
Nancy E. Harding, Ph.D., Kelco Biopolymers  
Greg Kelner, Ph.D., Arena Pharmaceuticals  
Kevin A. Krown, Ph.D., Biology  
Brett P. Monia, Ph.D., Isis Pharmaceuticals  
Tilman Oltersdorf, Ph.D., Idun Pharmaceuticals  
Forest Rohwer, Ph.D., Biology  
Gregor Zlokarnik, Ph.D., Aurora Biosciences

## General Information

The Molecular Biology Institute (MBI) administers the Master of Arts and Master of Science degrees in biology with an emphasis in molecular biology. The MBI is currently composed of members from the Departments of Biology, Chemistry, 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.

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.

## 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 2.75 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 Two 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)**

In addition to meeting the requirements for classified graduate standing and the basic requirements for the master's degree as described in Part Two 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. Students who achieve a sufficiently high score on the molecular biology proficiency examination given to all incoming molecular biology M.S. students may be excused from this requirement. 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 Emphasis in Molecular Biology**

**UPPER DIVISION COURSES**

**Biology (BIOL)**

- 549. Microbial Genetics and Physiology (3)
- 551. Recombinant DNA (3)
- 551L. Recombinant DNA Laboratory (2)
- 554. Molecular Virology (2)
- 555. Principles of Electron Microscopy (1)
- 556. Scanning Electron Microscopy Laboratory (2)
- 557. Transmission Electron Microscopy Laboratory (3)
- 561. Radiation Biology (3)
- 563. Plant Physiology (3)
- 569. Molecular Pharmacology (3)
- 570. Neurobiology (3)
- 575. Molecular Basis of Heart Disease (3)
- 577. Embryology (4)
- 584. Medical Microbiology (2)
- 585. Cellular and Molecular Immunology (3)
- 590. Physiology of Human Systems (4)
- 595. Computers in Biomedical Research (3)
- 596. Special Topics in Biology (1-4)
- 597A. Univariate Statistical Methods in Biology (3)

**Chemistry (CHEM)**

- 510. Advanced Physical Chemistry (3)
- 550. Instrumental Methods of Chemical Analysis (2)
- 560A-560B. General Biochemistry (3-3)
- 567. Biochemistry Laboratory (3)
- 596. Advanced Special Topics in Chemistry (1-3)

**GRADUATE COURSES**

**Biology (BIOL)**

- 600. Seminar (2-3)
- 630. Signal Transduction (3)
- 694. Advanced Topics in Virology (1-4)
- 696. Advanced Topics in Biology (1-3)
- 750. Molecular Biophysics (3)
- 797. Research (1-3) Cr/NC/RP
- 798. Special Study (1-3) Cr/NC/RP

**Chemistry (CHEM)**

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

**GRADUATE COURSES IN MOLECULAR BIOLOGY (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.

**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.

**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.