

BIOLOGICAL SCIENCES (BISI)

Graduate Degree Program

College: Computer, Mathematical, and Natural Sciences

Abstract

The Biological Sciences (BISI) Graduate Program offers a wide range of training opportunities for students interested in pursuing doctoral level research in exciting, diverse areas across the biological sciences. BISI is an interdepartmental umbrella program that consists of four Areas of Concentration:

- Behavior, Ecology, Evolution, and Systematics (BEES)
- Computational Biology, Bioinformatics, and Genomics (CBBG)
- Molecular and Cell Biology (MOCB)
- Physiological Systems (PSYS)

Graduate students in BISI are associated with one of these areas, but their interests often span multiple concentrations, which allows the development of innovative research projects across traditional disciplinary boundaries. Descriptions of each Concentration Area, faculty research interests, and more detailed programmatic information are available at [bisi.umd.edu](http://www.bisi.umd.edu) (<http://www.bisi.umd.edu>).

Although the BISI Program is administered within the College of Computer, Mathematical, and Natural Sciences, it involves distinguished graduate faculty from multiple departments and Colleges at the University of Maryland as well as outstanding adjunct faculty from nearby research institutions. Students may have opportunities to work with participating scientists from - as examples - the National Institutes of Health; Smithsonian Institution, including the National Museum of Natural History, the National Zoo, and Molecular Systematics Laboratory; the Food and Drug Administration; and the U.S. Department of Agriculture. BISI students have an incomparable wealth of potential research options and collaborations that extend from Maryland's College Park campus throughout the Washington D.C. metropolitan area.

Financial Assistance

Students are supported through fellowships, research assistantships, and/or teaching assistantships. Each type of funding provides a stipend, tuition remission, and access to health and dental insurance and a prescription drug plan. Historically, all students have been supported throughout their graduate careers.

Fellowships are offered on a competitive basis. There are no separate financial disclosure forms to fill out as part of the graduate application process.

Teaching assistantships require students to assist a faculty member in teaching a course or lab section(s). Benefits of teaching assistantships include building communication and organizational skills as well as resume enhancement for academic, government, or private sector jobs. It is also delightfully rewarding to explain concepts to students and then witness their excitement as ideas 'click' and their questions are resolved.

Contact

Students are strongly encouraged to communicate directly with faculty in the area of their interest. Additional general information may be obtained by emailing bisi@umd.edu or by calling the Biological Sciences Graduate Office at 301-405-6905.

Please visit the Biological Sciences Graduate Program website, featuring a search engine to match research interests with faculty and links to all Concentration Areas: [bisi.umd.edu](http://www.bisi.umd.edu) (<http://www.bisi.umd.edu>)

The Graduate School provides detailed information on International Student Admission here: <http://gradschool.umd.edu/admissions/international-admissions> (<http://gradschool.umd.edu/admissions/international-admissions/>) and additional information for international graduate students is available on the International Students and Scholars website at <http://globalmaryland.umd.edu/>.

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Courses: BEES (<https://academiccatalog.umd.edu/graduate/courses/bees/>) BIOL (<https://academiccatalog.umd.edu/graduate/courses/biol/>) BIOM (<https://academiccatalog.umd.edu/graduate/courses/biom/>) BISI (<https://academiccatalog.umd.edu/graduate/courses/bisi/>) BSCI (<https://academiccatalog.umd.edu/graduate/courses/bsci/>) CBMG (<https://academiccatalog.umd.edu/graduate/courses/cbm/>) ENTM (<https://academiccatalog.umd.edu/graduate/courses/entm/>) MOCB (<https://academiccatalog.umd.edu/graduate/courses/mocb/>)

Relationships: Biochemistry (BCHM) (<https://academiccatalog.umd.edu/graduate/programs/biochemistry-bchm/>), Biophysics (BIPH) (<https://academiccatalog.umd.edu/graduate/programs/biophysics-biph/>), Chemistry (CHEM) (<https://academiccatalog.umd.edu/graduate/programs/chemistry-chem/>), Entomology (ENTM) (<https://academiccatalog.umd.edu/graduate/programs/entomology-entm/>), Marine, Estuarine, and Environmental Sciences (MEES) (<https://academiccatalog.umd.edu/graduate/programs/marine-estuarine-environmental-sciences-meess/>), Neurosciences and Cognitive Science (NACS) (<https://academiccatalog.umd.edu/graduate/programs/neurosciences-cognitive-science-nacs/>)

Admissions

General Requirements

- Statement of Purpose
- Transcript(s)
- TOEFL/IELTS/PTE (international graduate students (<https://gradschool.umd.edu/education/z069/>))

Program-Specific Requirements

- Letters of Recommendation (3)
- CV/Resume
- Supplementary Application (<https://gradschool.umd.edu/sites/gradschool.umd.edu/files/uploads/admissionsforms/umsupplementaryapplicationbisi.pdf>)

- Writing Sample (optional)
- Publications/Presentations (optional)

All students applying to the Biological Sciences Graduate Program must have a Bachelor's degree from a recognized undergraduate institution. Applicants are expected to have a strong academic record, including coursework in advanced areas of biology as well as at least one year of calculus, general chemistry, organic chemistry, and physics. Able students with deficiencies in a particular area may be admitted and the deficiency corrected after enrollment. **Students are asked to identify a concentration area and research interests on the general application.**

To explore matches of your interests with those of BISI faculty, see the BISI website, [bisi.umd.edu](http://www.bisi.umd.edu/) (<http://www.bisi.umd.edu/>).

For more admissions information or to apply to the program, please visit our Graduate School website: <https://gradschool.umd.edu/admissions> (<https://gradschool.umd.edu/admissions/>)

Application Deadlines

| Type of Applicant | Fall Deadline |
|---|---------------|
| Domestic Applicants | |
| US Citizens and Permanent Residents | 3 Dec |
| International Applicants | |
| F (student) or J (exchange visitor) visas; A,E,G,H,I and L visas and immigrants | 3 Dec |

Other Deadlines: Please visit the program website at <http://www.bisi.umd.edu>

Requirements

- Biological Sciences, Doctor of Philosophy (Ph.D.) (<https://academiccatalog.umd.edu/graduate/programs/biological-sciences-bisi/biological-sciences-phd/>)
- Biological Sciences, Master of Science (M.S.) (<https://academiccatalog.umd.edu/graduate/programs/biological-sciences-bisi/biological-sciences-ms/>)

Facilities and Special Resources

The campus and local area provide students access to a vast array of instrumentation, equipment, facilities, and technologies to advance biological research. As examples, the college has state of the art facilities for research in all aspects of cell and molecular biology including cell and organism culturing, protein and nucleic acid analyses, peptide sequencing, oligonucleotide synthesis and sequencing, fluorescence, confocal microscopy, scanning and transmission electron microscopy, computer graphics for molecular modeling, NMR, mass-spectroscopy, and X-ray diffraction. Students have access to a laboratory for evolutionary molecular sequence analysis; gas source stable isotope mass spectrophotometer; bioacoustic lab; flume lab; GIS (graphic information systems) lab; and high-speed network access to a wide range of desktop and super-computing facilities. Greenhouses and animal care facilities are available.

We also have several state-of-the-art shared instrumentation laboratories. Two center around biological imaging for both electron and light microscopy, including a field-emission scanner and an image reconstruction/deconvolution microscope. Another shared laboratory

augments existing sequencing facilities on campus, enabling large-scale processing and sequencing of nucleic acids, with multiple robotic sequencers and real time PCR. Other core facilities provide instrumentation for fluorescence-activated cell sorting (FACS), NMR, mass spectrometry, and microarray technology. Equipment and analytical instruments are available in both faculty and core laboratories for the maintenance of animal and plant tissue cultures, for the production of monoclonal antibodies, for the synthesis and micro-analysis of proteins, for large-scale fermentation and cultivation of microorganisms, and for computer assisted molecular modeling. Support staffing in shared instrumentation facilities is provided by the college, and maintenance costs have been subsidized by the college, thereby providing even occasional users with appropriate training and access, and simultaneously keeping instrument use costs low. This strategy provides exceptional opportunities for research and training, and enables graduate students to perform experiments with instrumentation that is at the leading edge of biological technology.

Students have access to the Smithsonian National Museum and USDA collections of living and preserved organisms.

LIBRARY FACILITIES

The library facilities on campus, as well as their online accessibility, are outstanding. In addition, there are libraries in the local area with specialized collections. The most important are the National Agricultural Library, the Library of Congress, the National Library of Medicine, and the Smithsonian Institution Library. Thus, the University of Maryland's region contains perhaps the most comprehensive collections of books and journals in the world.