COLLEGE OF
Saint Benedict Saint John's
UNIVERSITY

Biochemistry

Program Overview

The biochemistry major combines the strengths of both our chemistry and biology faculty. That gives our students the opportunity to do the kind of original research that will get them prepared for their future — either in graduate school, medical school or in the job market.

Introduction

Through the biochemistry major, the biology and chemistry departments at the College of Saint Benedict and Saint John's University strive to provide a truly integrative and interdisciplinary education in the biology and chemistry of life within a liberal arts tradition.

Our biochemistry program is designed to help students understand how living material and processes are constructed, organized and regulated. Together, the disciplines of biology and chemistry can provide such an understanding, since neither a reductionistic approach of studying individual molecules, nor a global approach of studying entire organisms or systems is sufficient to obtain an in-depth understanding of the cellular and molecular bases of life. Both approaches are required, and the expertise of faculty in both biology and chemistry is necessary.

In the best liberal arts tradition, the CSB/SJU biochemistry program will build these biological and chemical foundations in a context that helps students become scientifically responsible citizens, with the knowledge, skills, attitudes and values that allow them to be successful in their selected professions.

Curriculum

Some biochemistry course offerings include:

- General Chemistry I and II
- Organic Chemistry I and II
- Biochemistry I and II
- Thermodynamics or Quantum Chemistry
- Analytical Chemistry
- Cellular Life
- Cellular Biology
- Molecular Biology
- Calculus I and II
- Physics for Life Sciences I and II or Foundations of Physics I and II
- For a complete listing of courses, please visit www.csbsju.edu/biochemistry

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We offer students a variety of learning opportunities such as formal courses with integrated laboratories, hands-on experiences with modern instrumentation and computers, research projects and seminar programs, all carried out in an atmosphere of support and encouragement for our students.

Facilities

Students will learn biochemistry in exceptional facilities on both campuses. The chemistry department is housed in the Ardolf Science Center at CSB. The building is equipped with state-of-the-art laboratories and classrooms that support a wide variety of classroom teaching methods.

The chemistry department updates and modernizes its equipment on a continuous basis. The department has more than
$1 million in modern instrumentation, including a new $70,000 gas chromatograph-mass spectrometer intended for second-year organic students and a spectrofluorometer, which is used predominately by students in biochemistry and instrumental analysis. The department has recently obtained a grant for a liquid-chromatography-mass spectrometer. All instruments are used by research students as well.

The biochemistry/nutrition lab has a small animal room, a walk-in cold room, a high speed centrifuge, and a laminar flow hood and incubator for cell growth.

The Ardolf Science Center is also equipped with a modern computer lab with both PCs and UNIX-based Silicon Graphics workstations. Software, from word processing and spreadsheets, to sophisticated programs for mathematical analyses, molecular modeling and computational chemistry, is available to all students and is integrated throughout our curriculum.

The biology department is housed in the Science Building at SJU, which includes state-of-the-art laboratories especially designed for the study of cell biology, microbiology, virology, biochemistry, molecular biology, immunology, histology and introductory biology as well as collaborative research spaces where student and faculty members work side by side. The Peter Engel Science Center at SJU includes classrooms for genetics, anatomy, ecology and botany; collections of both invertebrates and vertebrates; a modern greenhouse; facilities for aquatic research; and the largest herbarium of any Minnesota private college.

Research Opportunities

Research is perhaps the best way to experience the excitement of modern biochemistry and to really develop a deeper understanding of it. All majors are required to do either library or laboratory research. We strongly encourage you to do undergraduate laboratory research, either at CSB and SJU or off campus. Not only will it help you get into graduate/medical schools or gain employment, but it will also develop and solidify your interest in biochemistry. You will also gain the experience of working closely with a professor who will mentor you in your project.

The biology and chemistry departments have many opportunities for undergraduate research. You may apply for selection into a 10-week summer undergraduate program. Students live on campus and receive a summer stipend as well as board. You may also continue or start research in the academic year.

Many of our students choose to do summer research off campus. In recent years, our students have done summer research at:

Princeton University, Princeton, N.J.
Texas South West Medical Center, Dallas, Texas
Pacific Northwest Research Institute, Seattle, Wash.
National Institute of Health, Bethesda, Md.
National Cancer Institute, Bethesda, Md.
Clemson University, Clemson, S.C.
University of Minnesota, Minneapolis, Minn.
University of Kansas, Lawrence, Kan.
Eppley Institute, Omaha, Neb.
Montana State, Bozeman, Mont.

Outcomes:

This major is particularly useful for students interested in graduate school in biochemistry, molecular biology, cell biology, pharmacology, pharmacy and biophysics. In addition, it is a great major for students interested in attending medical school as medicine becomes more molecular in its diagnosis and treatment in the post-genomic era. Likewise it is excellent preparation for students interested in entry-level industrial careers in biotechnology and pharmaceutics.

Recent Graduate Success

Many of our students have gone on to prestigious graduate programs at:

Mayo Clinic/Foundation, Rochester, Minn.
University of Minnesota Medical School, Minneapolis, Minn.
Iowa State University, Ames, Iowa
University of Texas Medical School, Houston, Texas
University of Wisconsin, Madison, Wis.
University of Washington, Seattle, Wash.
Vanderbilt University, Nashville, Tenn.
Stanford University, Palo Alto, Calif.

Graduates from our programs that have been interested in biochemistry have also attended the following medical schools:

Mayo Clinic/Foundation, Rochester, Minn.
University of Iowa, Iowa City, Iowa
University of Minnesota, Minneapolis, Minn.
University of Wisconsin, Madison, Wis.
University North Dakota, Grand Forks, N.D.
Creighton University, Omaha, Neb.

Program Highlights

- We have more than $1 million in modern instrumentation, including a new spectrofluorometer — which is used predominately by students in biochemistry for instrumental analysis.
- Our students have won Howard Hughes Medical Institute and National Institute of Health Fellowships to attend graduate school.
- CSB and SJU have recently received a grant from Merck for undergraduate biochemistry research.
- Small introductory classes and labs give you plenty of faculty interaction throughout your degree program.
- *Peterson's Top Colleges* for Science lists our science and math programs among the best in the nation.

Faculty Members

Mani Campos
Ph.D., Pennsylvania State University

Kate Graham
Ph.D., Cornell University

Henry Jakubowski
Ph.D., University of Iowa

Ellen Jensen
Ph.D., University of Nebraska, Lincoln

Brian Johnson
Ph.D., University of Minnesota

Jeanne Marie Lust, OSB
Ph.D., University of Minnesota

Ed McIntee
Ph.D., University of Minnesota

Anna McKenna
Ph.D., Clemson University

David Mitchell
Ph.D., University of Texas-Austin

Michael Reagan
Ph.D., Washington University

Elizabeth Wurdak
Ph.D., Dartmouth College