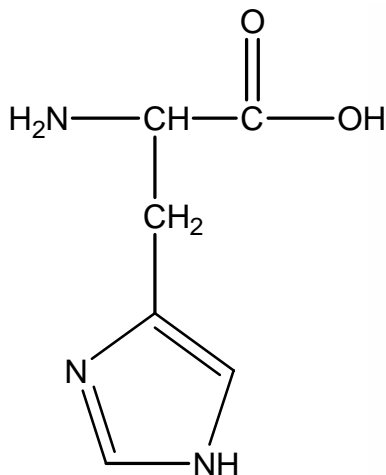


CAREERS IN CHEMISTRY:
BIOCHEMISTRY AND
BIOTECHNOLOGY



What is Biochemistry?

Biochemistry is the study of chemistry in living systems. While there is a good deal of overlap with areas such as molecular and cellular biology, biochemistry is distinct in its focus on fully characterizing biological molecules and their interactions.

Biochemists work in a wide range of positions, from chemical and pharmaceutical manufacturing to agriculture and environmental management. Biochemists also have extensive career opportunities in government agencies and in academia.

What is Biotechnology?

Biotechnology is the use of living organisms to manufacture useful products. It may include the creation and culture of genetically modified organisms, or the extraction and immobilization of enzymes for use in chemical processing.

While persons possessing a bachelor's degree are highly employable in the field, most scientists recommend a PhD for those seeking to do creative work. The field is growing rapidly, and biotechnologists are finding work in both large and small companies as well as academia.

Careers in Biotechnology and Biochemistry

Brooklyn College does not offer a bachelors degree in Biochemistry *per se*, but can start you on a career in the field. An applicant with a bachelor's degree in Chemistry – with or without a minor in Biochemistry – is a strong candidate for admission to a master's or doctoral program in biochemistry. And employers looking to fill positions in biochemistry will generally accept applicants with a degree in chemistry and suitable coursework and research experience. Employers want skills, not labels, and you can acquire those skills as a Chemistry major.

Biotechnology is an emerging field, and few schools offer undergraduate degree programs in biotechnology. Those wishing to enter the field at the bachelor's level should take appropriate coursework (see facing page). Students interested in graduate school should consider schools offering biotechnology degree programs, but may also want to consider a degree in chemistry or biochemistry from a school in which the faculty have extensive research interests in biotechnology.

Planning Your Studies in Biochemistry and Biotechnology

Both disciplines are extremely rigorous, and students interested in pursuing these careers are advised to take a Bachelor's of Science (BS) in chemistry and a minor in Biochemistry. Pamphlets describing both of these are available from the Chemistry Department (359 NE). Students may also request the "Careers in Chemistry" folder to find out more information about careers in Biochemistry and Biotechnology, or speak to the departmental advisor (see contact information on the back page).

Recommended Coursework

Preparation for a Career in Biochemistry:

- Completion of a BS in Chemistry (see "The Chemistry Major").
- Completion of a minor in Biochemistry (see "The Biochemistry Minor").
- Students are advised to complete at least some of the following electives:
 - Cell and Molecular Biology (Bio 17.1, 35); Microbiology (Bio 52 & 52.2); Genetics (Bio 58)

Preparation for a Career in Biotechnology:

- Completion of a BS in Chemistry (see "The Chemistry Major").
- Completion of a minor in Biochemistry (see "The Biochemistry Minor").
- Students are advised to complete at least some of the following electives:
 - Cell and Molecular Biology (Bio 17.1, 35); Microbiology (Bio 52 & 52.2); Genetics (Bio 58); Biotechnology of Algae (Bio 59)

"Announced in 1868 by the chemist A. Crum-Brown and the biologist T. R. Fraser; [the] principle – that chemical structure determines biological activity – underlies modern Western drug therapy."

-- Richard J. Friary, "Jobs in the Drug Industry: A Career Guide for Chemists"

For additional information on Biochemistry and Biotechnology see:

The American Chemical Society: <http://www.acs.org>

The American Society for Biochemistry and Molecular Biology: <http://www.asbmb.org>

The Biotechnology Human Resource Council (Canadian):
<http://www.bhrc.ca>

The Virtual Library of Biochemistry and Cell Biology
<http://www.biochemweb.org>

Richard J. Friary, "Jobs in the Drug Industry: A Career Guide for Chemists," Academic Press, 2000

Want more?

The Department of Chemistry has a "Chemistry Careers" folder in the main office (359 NE). Stop by and ask the secretary to let you take a look!

"Life science companies ... seek chemists of all descriptions. Physical chemists, analytical chemists, synthetic organic chemists, combinatorial chemists, medicinal chemists, and biochemists: All are welcome in an industrial world that must cope increasingly with the need to synthesize and test thousands of new molecules." -- Peter Gwynne, science writer and former science editor of *Newsweek*

To discuss a Chemistry Major:

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