

# Biochemistry

## Curriculum

The curriculum provides a broad background in chemistry and biological science and permits flexibility in meeting student interest. Courses in biochemistry and molecular biology provide students with sufficient background in the basic sciences of mathematics, physics, chemistry, and biology to meet the needs for graduate or professional program in most fields of medicine, dentistry and veterinary medicine.

## Biochemistry majors develop the following skills:

**Communication:** Learn to communicate the results of your research and laboratory work in both written and oral form

**Teamwork:** Learn to work in groups for collaboration in the classroom and lab

**Laboratory Skills:** Learn to utilize modern instrumentation, technology and computers which are integrated into classrooms and laboratories

**Research:** Learn to work in advanced laboratories and complete independent research which will teach self-motivation and problem solving processes

**Analytical Thinking:** Learn to analyze and interpret research findings and other data related to your experiments and lab work

## Get Involved

Delta Nu Alpha  
 Biochemistry and Molecular Biology  
 Graduate Student Association  
 Pre- Health Professionals Club  
 Pre- Physician's Assistant Club  
 Pre- Occupational Therapy Club  
 Pre- Veterinary Club  
 Pre- Optometry Student Association  
 Pre- Pharmacy Student Association

### College of Arts & Sciences Career Services

213 Life Science East  
 Tel: 405 744 5658

For appointments and resources:  
<http://cascareers.okstate.edu>

## Job and Internship Websites

- American Society for Clinical Laboratories  
<http://www.ascls.org>
- Bio Space  
<http://www.biospace.com/jobs/homepage/>
- Biochemistry Society  
<http://www.biochemistry.org/education/careers.aspx>
- Federal Jobs  
<http://www.usajobs.gov>
- Jobs Abroad  
<http://www.jobsabroad.com>
- Mayo Clinic  
<http://www.mayo.edu/mgs/surf.html>
- NASA  
<http://nasajobs.nasa.gov>
- Navy  
<http://www.navy.com/careers/healthcare/healthcare-sciences/biochemistry.html>
- National Institute of Environmental Health Sciences  
<http://www.niehs.nih.gov/careers/jobs/index.cfm>
- National Institute of Health  
<http://www.jobs.nih.gov/vacancies/student>
- National Science Foundation  
<http://www.nsf.gov/careers/openings/>
- Office of Science  
<http://science.energy.gov/about/jobs>
- Research Gate  
<http://researchgate.net/jobs/>
- Science Jobs  
<http://www.newscientist.com>  
<http://www.sciencejobs.org>
- Science Careers  
<http://www.sciencecareers.org>
- Top USA jobs  
<http://biochemistry.jobs.topusajobs.com/>
- US Dept. of Energy, Dept. of Science  
<http://science.energy.gov>

# Biochemistry Career Paths...

**Potential Career Paths:** Biochemists study the chemical components and processes of living systems including plants, insects, viruses, microorganisms, and mammals to explain how and why chemical reactions occur. Biochemistry includes the sciences of molecular biology; immunochemistry; neurochemistry; and bioinorganic, bioorganic, and biophysical chemistry. The underlying principle of biochemistry understands the structure of living systems. By understanding the structure of something, a scientist has a vital start to understanding its function.

**Medicine and Health:** Diseases are prevented by vaccines developed and produced by biochemists. Expertise in protein chemistry is required for traditional vaccines and in nucleic acid chemistry for the new DNA-based vaccines. Many techniques for detecting diseases are also founded on biochemistry, from enzyme assay to magnetic resonance imaging (MRI). Biochemists work to develop new diagnostic tools and improve existing systems.

**Government:** The federal government funds many biochemical research projects through the Food and Drug Administration, the Environmental Protection Agency and the National Institutes of Health.

**Navy:** Research Biochemists conduct and manage basic and applied research on biochemical problems of interest to the Navy, including harnessing solar and sea power, or developing a vaccine to battle a new disease. Forensic Toxicologists work in military forensic laboratories, Navy Research Laboratories or Environmental Preventive Medicine Units. Work with the Naval Criminal Investigative Service (NCIS), or serve as a member of a deployable Chemical, Biological, Radiological and Environmental (CBRE) Training Team, defending against biological, chemical and nuclear weapons.

**Drug Manufacture and Design:** Doctors prescribe them, pharmacists dispense them, but chemists and biochemists discover new drugs. In order to discover a new drug, a thorough understanding of the interaction between biological macromolecules and small molecules is needed. Biochemists are also involved in their production and quality assurance.

**Research:** Biochemists often have the opportunity to work in teams on research projects or they are assigned individual tasks in modern, well-equipped labs. There are plenty of job openings for biochemists interested in carrying out applied research for private companies in health and beauty care, chemical manufacturing, food and drink production, medical instruments and pharmaceutical development. Biochemistry's application to other fields and its focus on improving the quality of our lives means that laboratory research is guided by strict guidelines.

**Forensic Science:** (Crime Lab Scene) Not only are biochemists and their expertise used in DNA fingerprinting, but the examination of other biological samples (blood, saliva, semen, flesh, etc.) are essential in many criminal investigations.

**Education:** Biochemists, who opt for the teaching science courses at the high school or university level, will instruct in the laboratory and lecture in a classroom setting.

## Job Titles

Research Assistant	Analytical Chemist
Clinical Research Associate	Technical Writer
Quality Control Technician	Biostatistician
Secondary School Teacher	Clinical Technician
Pharmaceutical Researcher	Clinical Chemist
Research Assistant	Pharmacologist
Laboratory Technician	Toxicologist
Product Developer	Clinical Chemist
Chemical Safety Engineer	Associate Chemist
Independent Researcher	Marine Biologist
Industrial Researcher	Cytologist
Research Technician	Research Chemist
Chemical Safety Engineer	College Professor
Pharmaceutical Researcher	Anesthesiologist
Laboratory Supervisor	Perfumer
Applied Researcher	Biochemist
Dairy Technologist	Science Teacher
Biostatistician	
Biochemical Development Engineer	
Testing and Inspection Professional	

## Types of Employers

- Dept. of Agriculture
- Dept. of Defense
- Dept. of the Interior
- National Institutes of Health
- Drug Enforcement Agencies
- Crime labs/Forensic Labs
- Dept. of Health and Human Services
- Occupational Safety and Health Admin.
- Federal Bureau of Investigation
- Food and Drug Administration
- Public Health Service
- Nuclear Regulatory Commission
- Environmental Protection Agency
- Biotechnology Firms
- Colleges and Universities
- Research Institutes
- Energy Firms
- Health Maintenance Organizations
- Chemical Manufacturing Firms
- Hospitals
- Public Health Laboratories or Offices
- Cancer Research Institutes
- Environmental Pollution Control
- Centers for Disease Control
- Research and Development Labs
- Pharmaceutical Companies
- Medical Instrument Companies