# BIOCHEMISTRY
What can I do with this major?

## AREAS

### RESEARCH
- Basic Research
- Applied Research
- Grant Writing
- Administration

### Some areas of specialization:
- Healthcare: virology, immunology, enzymology
- Pharmacology: drug properties, interactions, application and development
- Environmental: testing, air/water/waste management, regulation
- Agricultural: crop production, herbicide/pesticide development and application
- Food science: preservation, nutrition
- Cosmeceutical: development and application
- Forensic: toxicology, DNA analysis, scientific instrumentation

## EMPLOYERS

- University laboratories
- Federal government laboratories/agencies:
  - National Science Foundation
  - National Institutes of Health
  - Food and Drug Administration
  - Environmental Protection Agency
  - Department of Agriculture
  - Department of Energy
  - Armed Services
- State and local government laboratories/agencies
- Public health departments
- Hospital laboratories
- Commercial medical laboratories
- Private testing laboratories including forensics
- Independent research foundations
- Industries:
  - Pharmaceutical
  - Biotechnology
  - Food processing
  - Cosmetic
  - Chemical
  - Petroleum
  - Agricultural

## STRATEGIES

- Bachelor's degree in biochemistry, biology, or chemistry qualifies one for laboratory technician or research assistant positions.
- Choose courses with laboratory components to build experimental and instrumentation skills.
- Gain experience in area of interest through internships, research with professors and/or complete a senior research project.
- Complete a certificate training program, usually one year, to learn specialized laboratory techniques.
- Take a course in grant writing.
- Earn master's degree in biochemistry for advanced positions, greater responsibility, and higher pay.
- Obtain Ph.D. to direct research projects and lead research teams.

## TEACHING

### Elementary
- Public and private schools, K-12

### Secondary
- Two-year community colleges/technical institutes
- Four-year institutions
- Professional schools including colleges of pharmacy, dentistry, medicine, veterinary medicine, and agriculture
- Museums
- Zoos
- Nature centers and parks

### Post-secondary
- Develop excellent communication skills.
- Volunteer with and/or tutor target age group.
- Complete an accredited education program for certification/licensure in biology and/or chemistry.
- Earn a master's degree for teaching at some two-year institutions.
- Prepare to attend graduate school by maintaining a high grade point average and securing strong faculty recommendations.
- Complete Ph.D. for college or university teaching.
### Areas

<table>
<thead>
<tr>
<th>HEALTHCARE</th>
<th>EMPLOYERS</th>
<th>STRATEGIES</th>
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<tbody>
<tr>
<td>Medicine</td>
<td>Hospitals</td>
<td>Plan on attending medical school or other related graduate program.</td>
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<tr>
<td>Dentistry</td>
<td>Colleges or universities</td>
<td>Maintain an outstanding grade point average, particularly in the sciences.</td>
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<tr>
<td>Optometry</td>
<td>Medical centers and clinics</td>
<td>Meet with a pre-health advisor periodically.</td>
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<tr>
<td>Podiatry</td>
<td>Private and group practice</td>
<td>Join related student organizations. Demonstrate leadership abilities.</td>
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<tr>
<td>Pharmacy</td>
<td>Health networks</td>
<td>Volunteer to work in a hospital or healthcare setting.</td>
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<tr>
<td>Chiropractic</td>
<td>Nursing homes</td>
<td>Find a summer job or internship in a hospital.</td>
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<tr>
<td>Veterinary Medicine</td>
<td>Rehabilitation centers</td>
<td>Secure strong faculty recommendations.</td>
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<tr>
<td>Occupational Therapy</td>
<td>Correctional facilities</td>
<td>Research all of the various fields within medicine to determine a particular career goal.</td>
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<tr>
<td>Physical Therapy</td>
<td>Large corporations</td>
<td>Develop a back up plan in case medical/graduate school admission is denied.</td>
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<tr>
<td>Public Health</td>
<td>Armed services</td>
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<td>Government agencies</td>
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<td>State and local public health departments</td>
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### Other Professional Opportunities

| Sales/Marketing                   | Biotechnology industry                        | Supplement biochemistry degree with coursework in chosen field.                                                                           |
| Technical Writing                 | Pharmaceutical and chemical companies         | Gain sales experience through internships, part-time work, or summer jobs for sales positions.                                             |
| Scientific Journalism            | Publishers:                                   | Take business and/or computer classes.                                                                                                      |
| Scientific Illustration          | Textbook, magazine, newspaper, book           | Become familiar with desktop publishing and other software packages.                                                                       |
| Regulatory Affairs               | Software firms                                 | Develop strong written and oral communication skills.                                                                                      |
| Administration/Management        | Regulatory agencies                            | Get experience writing for a school or local newspaper.                                                                                     |
| Scientific/Technical Recruiting  | Search firms                                   | Obtain an MBA or Ph.D. to reach high levels of administration.                                                                               |
| Intellectual Property/Patent Law | Law firms                                     | To pursue a J.D., participate in mock trial and pre-law associations, learn law school admissions process.                                  |
| Bioinformatics                    | Legal departments of corporations             |                                                                                                                                              |
GENERAL INFORMATION

- Biochemists are typically curious and creative with strong observational skills and the ability to persevere.
- Biochemists often interact with scientists from other disciplines. Learn to work independently and as part of a team.
- Develop the ability to communicate clearly to compile and share results in oral and written forms.
- Gain competencies in computers and mathematics.
- Read scientific journals to stay current on relevant issues in the field, and join related professional organizations to network and build contacts.
- As an undergraduate, seek laboratory experiences such as research projects, volunteering with professors, summer jobs, or internships.
- Visit government laboratories or research centers to learn more about opportunities in biochemistry. Schedule informational interviews to learn about the profession and specific career paths.
- Participate in research programs sponsored by organizations like the National Science Foundation and the National Institutes of Health.
- Consider a certificate program or specialized master's program to qualify for research technician positions.
- Become familiar with the specific entrance exam for graduate or professional schools in your area of interest.
- Maintain a high grade point average, and secure strong faculty recommendations.
- Earn master's degree for greater variety and autonomy on the job.
- Earn Ph.D. to work on high-level research projects, to direct research programs, to enter high levels of administration, and to teach at four-year post-secondary institutions. Postdoctoral fellowships may also be required.
- Combine an undergraduate degree in biochemistry with a degree in law, computer programming, business, education, information science, or other discipline to expand career opportunities.
- Learn the job application process for government positions.