

Careers in Biology

Being a biologist can be a fulfilling and exciting profession provided your own personal goals, talents, and interests match the activities of biologists. The information on these pages provides general career information for a variety of interests and careers in biology. Explore this area and discover the diversity of biology.

What do biologists do?

Research. Conducting research can be a satisfying and challenging experience that runs the gamut from the exhilaration of new discovery to the day-to-day tedium of repetitive experiments. Depending upon their interests and place of employment, biologists may engage in basic or applied research.

Basic research is pure science motivated by the need to answer questions about how organisms function or evolve. It is often curiosity-driven and it allows scientists to create new knowledge. Basic research is extremely important to society, because it fosters the development of new theories - conceptual frameworks that help scientists understand and explain the living world, and it provides the basis for applied research.

Applied research is characterized by the application of concepts and is driven by the need to solve problems that are often of immediate concern to society, medicine or industry. The distinction between basic and applied research is often blurred, however, because a scientist might be engaged in both enterprises as one flows logically from the other. For example, scientists can apply knowledge of the basic biology and ecology of an insect pest to develop an integrated pest management strategy that will minimize pesticide use and environmental damage.

Teaching. Teaching offers biologists personal as well as intellectual rewards. As faculty, biologists may teach in a formal classroom setting or serve as mentors in a research laboratory. The teaching setting may even extend beyond the boundaries of the classroom into the community or the environment.

Informal Education. Biologists may also communicate science to the public. For example, they might:

- create educational exhibits for museums, zoos or aquaria.
- give public lectures or workshops.
- write science articles published in newspapers, magazines and books.
- produce educational software or multimedia applications.
- develop educational films and television programs.

Administration. Biologists in academe, industry and government are often in positions that require many other skills in addition to their biological knowledge. Management and administrative positions require excellent communication skills and business knowledge, as well as information management and computer skills.

Who hires biologists?

Teaching institutions such as:

- colleges and universities
- community and junior colleges
- technical schools
- high school

Industries involved with the development and application of new products:

- agricultural products and pesticide production
- biological testing
- biotechnology
- food industry
- health-related consumer items
- independent research laboratories
- pharmaceutical sales and production

Governmental agencies are primary employers of biologists. Federal agencies include:

- Bureau of Land Management
- Environmental Protection Agency
- Fish and Wildlife Service
- Food and Drug Administration
- Geological Survey
- National Institutes of Health
- National Park Service
- National Science Foundation
- Department of Agriculture

Most states have agencies that are potential employers, such as:

- agricultural extension services
- resource protection authorities
- forest services
- health departments
- natural resource conservation boards
- water quality and water development boards

Other employers include:

- zoos and aquaria
- environmental consulting firms
- museums
- theme parks
- private foundations

How do I select a career?

Selecting a career that matches your personal goals and talents requires that you have enough background information to make an informed choice. Students with unrealistic expectations can be disappointed to find that the coursework, dedication and years of study required to become a scientist are not what they bargained for or contribute to the lifestyle that they want. Take the initiative early to explore career options.

Research different occupations and employers that hire biologists.

- Arrange to "shadow" someone in a career that interests you. Spend several days with him/her in the workplace to witness firsthand what it would be like to have a similar career.
- Review current job listings to see what characteristics employers want. Go to the library or Internet and access the classified advertisements in trade journals. Refer to the section at the end of this brochure for a listing of some helpful titles and Web sites.

Acquire practical experience through:

- Volunteer work.
- Summer college courses.
- Summer internships for high school students or undergraduates. Many colleges and universities offer summer internships, which are excellent opportunities to interact with scientists and gain practical research experience.
- Visit Peterson's Education Center on the Internet to do a quick search of summer programs. (<http://www.petersons.com/summerop/ssector.html>)
- Check with the undergraduate advisor for summer programs offered locally. Many research faculty have stipends for summer research in their laboratories or in the field.
- The Howard Hughes Medical Institute (HHMI) funds research experiences for both high school students and undergraduates. Search their web site for "summer programs." (<http://hhmi.org/search>)
- The National Science Foundation not only funds summer internships but also maintains a Web site with links to other summer programs. (<http://nsf.gov/>)
- *Undergraduate research.* Become involved with research as an undergraduate - preferably during the junior and senior years. Most universities have courses that may be listed as independent studies, problems or undergraduate research. An important part of the research experience is sharing your results through professional meetings and publishing papers. Most states have an Academy of Science with a Junior Academy specifically designed for high school students and college undergraduates. These are excellent opportunities to present your project results, meet faculty from state universities and hear their research presentations. Additionally, increasing numbers of undergraduate researchers present the results of their studies as talks and posters at the SICB Annual Meetings.

How much training will I need? Should I go to graduate school?

It depends upon your career goals. In general, you have the following options.

Bachelor's degree. Some students directly enter the workplace after completing their undergraduate degrees and have happy, productive careers. Many take entry-level positions in industry or government or become K-12 teachers.

Master's degree. Others go into graduate programs to build their knowledge to higher technical levels. A master's degree prepares you as a professional in a technical field or gives you the background to do more advanced study. People with master's degrees may become secondary school teachers, junior college instructors, or laboratory technicians in industry, government and universities.

Ph.D. degree. The Ph.D. degree is a research degree that allows you to add to the body of existing scientific and technical knowledge. If your career goals include directing research or teaching at the college or university level, you should strongly consider entering a doctoral program.

Postdoctoral Study. If you desire a research career in academe, it is often necessary to spend one or more years beyond the Ph.D. in postdoctoral study. If the field is very competitive, it is not unusual for scientists to have several postdoctoral positions in succession before they find suitable academic positions.

People who complete graduate studies share a strong commitment to their discipline and are prepared to face the high level of competition for grant money necessary to fund research. They enjoy learning, solving problems, discovering new facts and are excited about what they do.

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