**Careers in the Biological Sciences**

Pursuing a career in biology can be immensely rewarding and exciting. Studying biology teaches us to ask questions, make observations, evaluate evidence, and solve problems. Biologists learn how living things work, how they interact with one another, and how they evolve. They may study cells under a microscope, insects in a rainforest, viruses that affect human beings, plants in a greenhouse, or lions in the African grasslands. Their work increases our understanding about the natural world in which we live and helps us address issues of personal well being and worldwide concern, such as environmental depletion, threats to human health, and maintaining viable and abundant food supplies.

[Download the AIBS *Careers in Biology* brochure](http://www.aibs.org/careers/resources/career_brochure.pdf).

**Frequently Asked Questions about Careers in Biology**

* What do biologists do?
* How can I prepare for a career in biology?
* Where are the best college and university biology programs?
* What is the job outlook for the future?
* What are the salaries for biologists?
* Where can I find more information about people who have become biologists?
* Where can I find more information and job postings for biology-related careers?

**What do biologists do?**

There are several career paths you can follow as a biologist, including these:

**Research:** Research biologists study the natural world, using the latest scientific tools and techniques in both laboratory settings and the outdoors, to understand how living systems work. Many work in exotic locations around the world, and what they discover increases our understanding of biology and may be put to practical use to find solutions to specific problems.

**Health care:** Biologists may develop public health campaigns to defeat illnesses such as tuberculosis, AIDS, cancer, and heart disease. Others work to prevent the spread of rare, deadly diseases, such as the now infamous Ebola virus. Veterinarians tend to sick and injured animals, and doctors, dentists, nurses, and other health care professionals maintain the general health and well being of their patients.

**Environmental management and conservation:** Biologists in management and conservation careers are interested in solving environmental problems and preserving the natural world for future generations. Park rangers protect state and national parks, help preserve their natural resources, and educate the general public. Zoo biologists carry out endangered species recovery programs. In addition, management and conservation biologists often work with members of a community such as landowners and special interest groups to develop and implement management plans.

**Education:** Life science educators enjoy working with people and encouraging them to learn new things, whether in a classroom, a research lab, the field, or a museum.

* **Colleges and universities:** Professors and lecturers teach introductory and advanced biology courses. They may also mentor students with projects and direct research programs.
* **Primary and secondary schools:** Teaching younger students requires a general knowledge of science and skill at working with different kinds of learners. High school teachers often specialize in biology and teach other courses of personal interest.
* **Science museums, zoos, aquariums, parks, and nature centers:** Educators in these settings may design exhibits and educational programs, in addition to teaching special classes or leading tours and nature hikes.

**New directions in biological careers:** There are many careers for biologists who want to combine their scientific training with interests in other fields. Here are some examples:

* **Biotechnology:** Biologists apply scientific principles to develop and enhance products, tools, and technological advances in fields such as agriculture, food science, and medicine.
* **Forensic science:** Forensic biologists work with police departments and other law enforcement agencies using scientific methods to discover and process evidence that can be used to solve crimes.
* **Politics and policy:** Science advisors work with lawmakers to create new legislation on topics such as biomedical research and environmental protection. Their input is essential, ensuring that decisions are based upon solid science.
* **Business and industry:** Biologists work with drug companies and providers of scientific products and services to research and test new products. They also work in sales, marketing, and public relations positions.
* **Economics:** Trained professionals work with the government and other organizations to study and address the economic impacts of biological issues, such as species extinctions, forest protection, and environmental pollution.
* **Mathematics:** Biologists in fields such as bioinformatics and computational biology apply mathematical techniques to solve biological problems, such as modeling ecosystem processes and gene sequencing.
* **Science writing and communication:** Journalists and writers with a science background inform the general public about relevant and emerging biological issues.
* **Art:** All the illustrations in your biology textbook, as well as in newspaper and magazine science articles, were created by talented artists with a thorough understanding of biology.

If you are interested in learning more about nontraditional science careers, AIBS has a book available on the subject. Environmental scientist-turned-science writer Karen Young Kreeger reports on the experiences of nearly 100 scientists and provides case studies and career options for scientists in her book, *Guide to Non-Traditional Careers in Science*. The guide is organized by profession and includes one-on-one interviews, job-hunting advice, and comprehensive lists of resources.

**How can I prepare for a career in biology?**

If you are interested in becoming a biologist, there are some things you can do along the way to prepare yourself.

**In high school**

* **Take courses in math and science.** Biologists need a solid understanding of math, chemistry, physics, and of course biology. Taking these courses in high school will provide you with an excellent background and allow you to explore what scientists do.
* **Talk to biologists.** If you are interested in a health care career, visit doctors or veterinarians and ask for a moment to talk about their careers. If you are interested in outdoor work, talk to park rangers, land managers, and other professionals in your area.
* **Explore your college options.** Deciding where to go to college and what to study can be a daunting task. Research schools of interest. Talk to your guidance counselor, as well as to admissions counselors, faculty, and current students at these schools. There are excellent programs at a wide range of institutions, from large research universities to small liberal arts and community colleges.
* **Have fun!** While studies are important, remember to get out and enjoy yourself as well. Participate in any extracurricular activities of interest: a school club, a science fair, a sports team, or volunteer work. You'll learn teamwork while developing leadership and social skills, making you stand out not only as a future biologist but also as an individual.

**In college**

* **Talk to your advisor.** Your faculty advisor or guidance counselor is a great source of information for advice on classes to take, career path options, and job opportunities.
* **Consider how long you want to be in school.** For some biology jobs, a two-year college degree is sufficient. But most life science careers require at least a bachelor's degree and often an advanced degree, such as a master's degree. Research jobs typically require a doctorate, which may take five or six years of intense and demanding training.
* **Ask your professors about part-time jobs.** Many professors hire student assistants to help with library, field, and laboratory research. Not only will you earn some money and experience, but you'll also develop a professional relationship with someone who can give you career advice and write letters of recommendation.
* **Find summer internships.** Internships are a good way to learn about a career, make contacts, and gain experience in biology. Some internships may provide opportunities to do an original research project—a very rewarding experience that will show you how science works and get you thinking about graduate school.

**Where are the best college and university biology programs?**

There are many universities with strong biology programs. There is no "best" college to study biology. If you are considering a biology degree, search for a school that fits your needs, budget, and lifestyle. Large research universities offer broad course work, a variety of specialized concentrations, and many opportunities for independent research. Smaller colleges allow for small class sizes, individualized instruction, and frequent interaction with professors. In general, there are several key elements that make up a solid biology program at a college or university:

**Faculty diversity and experience**

* Most faculty members hold PhD degrees and have active, productive research programs.
* The faculty is an accurate representation of the diversity of biological disciplines: botanists, evolutionary biologists, zoologists, biochemists, cell biologists, ecologists, physiologists, taxonomists, and so on. Either the biology program contains faculty members in diverse fields, or the university has several individual departments that complement each other.

**Commitment to undergraduate education**

* Courses are taught by faculty members, not graduate students.
* The institution has an active faculty advisor program and an active career advising/career development program.
* The curriculum includes a variety of courses that provide a strong background in the natural and social sciences, humanities, and writing, while still allowing students to pursue their individual interests.
* Well-equipped libraries with Internet access to biology journals, and easily accessible computer labs for student use.

**Research opportunities for undergraduates**

* Faculty welcome students into their research groups as part-time workers, interns, and research assistants.
* Opportunities are available for undergraduates to pursue independent research projects.
* There are programs and centers that suit a student's particular interest, for example, a field station to study ecology, proximity to the coast or a marine station to study marine biology.

**What is the job outlook for the future?**

While there will always be a need for bright, energetic, and educated individuals with a strong understanding of biology, opportunities vary depending on the status of local and national economies. For current job outlook information, check the Job growth is expected in a number of areas, biotechnology and molecular biology in particular. Business leaders have begun to address the issue of creating more science and technology jobs in the United States to prevent them from being exported. For more information, take a look at the report (in PDF format) [Tapping America's Potential: The Education for Innovation Challenge](http://www.businessroundtable.org/publications/publication.aspx?qs=2AF6BF807822B0F1AD1478E). Also, the number of openings in federal government agencies charged with managing natural resources, such as the Interior and Agriculture Departments and the Environmental Protection Agency, is expected to grow; see the report (in PDF format) [Federal Natural Resources Agencies Confront an Aging Workforce and Challenges to Their Future Roles](http://www.rnrf.org/rrj.html#workforce). These openings will become available as many senior-level biologists and life scientists retire in the coming years.

**What are the salaries for biologists?**

A 2003 survey by AIBS in conjunction with the Abbot and Langer Company found that biologists with less than one year experience have a starting salary of around $33,000 per year. Data from a 2005 US Bureau of Labor Statistics report show that the field of life sciences as a whole has a mean annual salary close to $60,000. As biologists gain more experience and education in their field, those in private industry may earn salaries of over $80,000, while those working in government, academia, and the nonprofit sector earn around $60,000 to $70,000. Those with over 30 years of experience have a median salary of around $103,000. Keep in mind that salaries may vary greatly depending on geographic location, job type, and experience and education.

As you can see, higher salaries are found in private research companies and government agencies, where you may have more job security, advancement opportunities, and independence in your work. While jobs in nonprofit groups or academic institutions may in general have lower salaries, many biologists find great personal reward in working for an organization that is affecting change and has an emphasis on teamwork and collaboration.

**Where can I find more information about people who have become biologists?**

If you think there's one type of person who becomes a biologist, think again. All kinds of people with diverse talents are drawn to careers in biology, for many reasons. Get to know a few and you'll see. Here are links to profiles of biologists in a variety of fields who come from a wide range of backgrounds:

* [Biology, Evolution and Ecology Career Panel at the SACNAS National Convention](http://www.aibs.org/careers/exploring_careers_in_biology_evolution_and_ecology.html)
* [Biologists who have been selected as AIBS Diversity Scholars](http://www.aibs.org/diversity/diversity_scholars_program.html)
* [Profiles of Ecologists—Ecological Society of America](http://www.esa.org/education/ecologists_profile/EcologistsProfileDirectory/)
* [Botanical Society of America Careers page](http://www.botany.org/bsa/careers/)
* Profiles of Marine biologists and careers in
[Marine Science—NOAA Sea Grant](http://marinecareers.net/careerfields.html)
* [National Geographic's Emerging Explorers](http://www.nationalgeographic.com/emerging/ourExplorers.html)
* [Profiles of Canadian scientists](http://www.science.ca/scientists/scientists.php)
* Profiles of Biologists from
[Arizona State University's "Ask a Biologist" Program](http://askabiologist.asu.edu/profiles/index.html)
* Becoming a Biomedical Scientist:
[Video profiles from the Howard Hughes Medical Institute](http://www.hhmi.org/becoming/)
* SACNAS Biography Project:
[Profiles of Latin American and Native American Scientists](http://www.sacnas.org/biography/)
* [Profiles of Minority Environmental Professionals](http://www.umich.edu/~meldi/4_profiles_minprof.html)—Minority Environmental Leadership Development Initiative
* The Faces of Science:
[Profiles of African Americans in the Sciences](https://webfiles.uci.edu/mcbrown/display/faces.html)
* [Profiles of Famous Women in Science](http://www.bios.niu.edu/wis/profiles.html)
* Association of Medical Research Centers:
[Profiles of Women in Science](http://www.amrc.org.uk/index.asp?id=14649)

**Where can I find more information and job postings for biology-related careers?**

AIBS member societies and organizations are an excellent place to start looking for jobs, graduate school opportunities, and other career-related resources. Other web resources are listed below.

**General career development and job hunting sites**

* [AAAS Science Careers Page](http://sciencecareers.sciencemag.org/)
* [Conservation Job Board](http://www.conservationjobboard.com/JobBoard.php)
* Environmental Jobs and Careers: <http://www.ecoemploy.com/>
* Environmental Career Opportunities: <http://www.ecojobs.com/>
* [Minority Environmental Leadership Development Initiative](http://www.umich.edu/~meldi/)
* [National Academy of Sciences career planning guide](http://nationalacademies.org/careerguides.html)
* [National Institutes of Health—Career Exploration](http://science.education.nih.gov/home2.nsf/Careers/Career%2BExploration)
* [Virtual Hospital—Careers in Biomedical Research](http://www.vh.org/welcome/tour/discovery/)
* [AccessExcellence—Biotechnology Careers](http://www.accessexcellence.org/RC/CC/)
* [*The Scientist* Magazine—Science careers](http://careers.the-scientist.com/)
* [Sloan Career Conerstone Center—Science, Technology, Engineering, Mathematics & Computer Career Planning](http://www.careercornerstone.org/)

**Internship listings**

* [Environmental Careers Organization—short- and long-term internships in the environmental field](http://www.eco.org/)
* [Rochester Institute of Technology—biology and biotechnology internship listings](http://www.rit.edu/~gtfsbi/Symp/summer.htm)
* [Kalamazoo College—research opportunities listing](http://www.kzoo.edu/biology/internopps.html)

**Research Experiences for Undergraduates (REU) programs**

* [National Science Foundation's REU page](http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5517&from=fund)
* [Harvard Forest](http://harvardforest.fas.harvard.edu/education/reu/reu.html)
* [Institute of Ecosystem Studies](http://www.ecostudies.org/reu.html)
* [Organization for Tropical Studies](http://www.ots.duke.edu/en/education/under_summer_reu.shtml)