



INDUSTRY OVERVIEW: SCIENTIFIC RESEARCH

What is Scientific Research?

With a degree in any of the sciences, one can enter the research field in a number of ways. This field is extremely diverse, encompassing research and development opportunities, laboratory work, field studies, and much more. Your level of education can determine how far you enter the field, as those right out of college can take advantage of some entry-level opportunities while other occupations require advanced degrees. The largest employer of professionals in this field is the federal government (i.e., National Institute of Health, Department of Agriculture, National Science Foundation, Department of Defense, and many other departments.) Opportunities within the private sector, such as pharmaceuticals, biotechnology, cosmetics, food sciences, and energy exist as well.

Career Tracks

Laboratory Technician: Performs the routine maintenance tasks that are needed to keep labs functioning such as cleaning and maintaining glassware, working with animals, operating lab equipment, ordering pertinent supplies, and other related tasks. This position exists in any type of research-based laboratory from biotechnology, to psychology, to chemistry, to medical.

Research Associate: Works at the bench conducting experiments under the guidance of scientists with PhDs. This is a great position for those interested in entering the Research and Development field but do not yet have a terminal degree. Research associates make detailed observations, analyze data and interpret results. They also must exercise technical discretion in the design, execution and interpretation of experiments that contribute to project strategies. In addition to conducting experiments, they may have to prepare technical reports, summaries, protocols, and quantitative analyses and may be responsible for identifying patentable inventions.

Pharmaceutical Sales Representative: Spends most of the time on the road, talking with pharmacists, hospital personnel, physicians, patient advocacy groups, and even retirement homes, increasing the visibility of their company's products and the volume of their sales. Pharmaceutical sales representatives with a science background have an advantage in this profession, in terms of both their credibility and their ability to educate themselves about product lines.

Quality Control Analyst: Performs ongoing tests to ensure that a company's manufacturing processes meet federal regulations. These professionals participate in development and implementation of standards, methods and procedures for inspecting, testing and evaluating the precision, accuracy and reliability of company products. Quality control analysts can make recommendations for corrective action necessary to assure conformity with quality specifications. There are many levels within a quality control department from entry-level testing to supervision and coordination which can require an advanced degree.

Bioinformatics Manager: Channels an interest for information technology into the science realm. They direct the design, development, implementation, and maintenance of the IT side of a research organization. Bioinformatics professionals oversee the computational infrastructure and control the flow of samples and information for large-scale studies. They must also provide web-based bioinformatics, establish access to relational databases and develop a network information system.

Patent Associate: Analyzes and assists scientists in protecting intellectual property. Professionals in this area have a strong science background and typically practice in their area of specialization (e.g., chemistry, engineering). In order to advocate on behalf of a scientist in legal proceedings to patent and protect new findings, patent attorneys must supplement their science background with a law degree. Oftentimes, patent associates can work for a firm that will pay for the cost of their law school education so they can then stay on as a full patent attorney.

Forensic Scientist: Analyzes biological, chemical, or physical samples taken into evidence during a criminal investigation. It's their work to provide the proof the police need to bring the case to court. Forensic scientists also examine contact trace materials associated with crimes in order to provide evidence for criminal investigations. The work is usually dealt with under three sections: biology, chemistry and drugs/toxicology. Occasionally, forensic scientists may be required to attend crime scenes but more often they work in a lab environment.

Soil Scientist: Evaluates and interprets soils and soil-related data for a variety of purposes including agricultural production, environmental quality and protection of human health and the environment. The main purpose of soil scientists is to manage soil research and provide guidelines for development and process. Management of soils can include purposes such as landscape design, mining, site restoration, natural resource management, and investigation of environmental hazards. The university degree should be in Soil Science, or closely related field (i.e., natural resources, environmental science, earth science, etc.) and include sufficient soils-related course. Many positions in this field are with the federal government, natural resource companies (such as oil companies), real estate development firms, and environmental groups.

Technical Writer: Combines writing skills with an interest in science. Professionals in this field write and edit many documents and items for use in scientific environments such as Standard Operating Procedures (SOPs), technical clinical and/or marketing publications including, but not limited to, procedure manuals and other related documents. Technical writers integrate various sources of information into a uniform style and language for regulatory compliance. They assist in developing documentation for instructional, descriptive, reference, publication and/or informational purposes and may coordinate the review, approval and revision of procedures, specifications, and forms. Along with other staff members, they often rewrite, clarify or reconstruct established documents.

Additional Related Occupations

Bioethicist	Perfumer
Medical illustrator	Software developer
Botanist	College professor
Bioterrorism expert	Public health official
Genetic counselor	Animal care manager
Zymurgy (Wine and beer making)	Biotechnology venture capitalist
Engineer (**See CDC Industry Overview for Engineering)	Biotechnology fund trader
Sustainability scientist	Taste Science / Flavor Chemistry

(**See CDC Industry Overview for Green Careers)

Requirements / Skills

In general, many advanced positions in the field of research require graduate degrees. For research, the most common advanced degree is a PhD. Often, if you enter a company as an entry level employee, they will fund your PhD studies. However, some of the positions above can be acquired with a Bachelor's and offer a good way to enter the field and gain experience before pursuing a higher degree. In order to succeed in this field, one must have strong quantitative and scientific reasoning skills. If it is a laboratory position, familiarity and proficiency with lab equipment and protocol is essential. As one advances in his/her career, there is increased

importance placed on receiving funding or being involved in the sales side for products; these positions require strong interpersonal and communication skills, both written and oral.

Salary

Salaries vary widely depending on setting, specialty and education level. The salaries below are the national average in these particular positions.

Bioinformatics Manager: \$77,000

Laboratory Technician: \$ 39,000

Technical Writer: \$61,000

Research Associate (Biotech): \$81,000

Quality Control Manager: \$71,000

Pharmaceutical Sales Representative: \$86,000 (varies depending on base pay and commission)

Perfumer: \$35,000

The largest employer of people in the scientific research field is the federal government, which utilizes a pay grade system. Working for the government has great fringe benefits, including healthcare and vacation time, as well as a set scale for pay increases and raises. Information on government pay grades can be found at www.opm.gov/oca/09tables/index.asp.

Associations

Biotechnology Industry Organization: www.bio.org

American Association of Pharmaceutical Scientists: www.aaps.org

American Chemical Society: www.acs.org

National Center for Biotechnology Information: www.ncbi.nlm.nih.gov

National Institutes of Health: www.nih.gov

American Society of Perfumers: www.perfumers.org

Websites

http://sciencecareers.sciencemag.org/career_development

http://sciencecareers.sciencemag.org/career_magazine/previous_issues/articles/2008_12_12/caredit.a0800181 (internships)

<http://scforum.sciencecareers.org>

www.sciencejobs.com

www.topresearchjobs.com

www.nih.gov

www.biospace.com

www.nsf.gov/funding/pgm_summ.jsp?pims_id=5517&from=fund

www.chemjobs.net

www.perfumerflavorist.com