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Medicinal Chemistry

Chemists in the Field



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Overview

Medicinal chemistry is a stimulating field as it links many scientific disciplines and allows for collaboration with other scientists in researching and developing new drugs.



Medicinal chemists apply their chemistry training to the process of synthesizing new pharmaceuticals. They also improve the processes by which existing pharmaceuticals are made. Medicinal chemists are focused on drug discovery and development and are concerned with the isolation of medicinal agents found in plants, as well as the creation of new synthetic drug compounds. Most chemists work with a team of scientists from different disciplines, including biologists, toxicologists, pharmacologists, theoretical chemists, microbiologists, and biopharmacists. Together, this team uses sophisticated analytical techniques to synthesize and test new drug products and to develop the most cost-effective and environmentally friendly means of production.

Careers in this Field

- Basic research into how various chemicals affect biological systems
- Drug development, including formulating drugs used to treat patients with diseases
- Testing potential new bio-active compounds in patient populations
- Developing guidelines for how new pharmaceuticals will be such as chemists at the U.S. Food and Drug Administration (FDA) who review new drug applications from pharmaceutical companies and the processes by which the substances are made



Education

Generally, pharmaceutical companies prefer to hire people with research experience, advanced degrees (especially in organic chemistry), and at least two years of post-doctoral experience. Most chemists in traditional

research careers are Ph.D. chemists, while chemists with B.S. degrees generally serve as research technicians. You can place yourself in a competitive position by getting as much industrial experience as possible, with a strong background in organic chemistry and biochemistry. A number of universities have medicinal chemistry departments, often associated with biological chemistry, pharmaceutical chemistry, pharmacology, or pharmacy programs.



Workspace



Medicinal chemistry offers a wide variety of lab opportunities in pharmaceutical, biotechnology, and medical device companies. Most chemists use their research skills to formulate, produce, characterize, and analyze new compounds for specific applications. However, each lab environment is unique in regards to daily activities and career opportunities. In some cases, laboratory work is not always required, for example, when reviewing drug applications at the FDA.



Technical Skills

Analytical	Background Knowledge	Communication
<ul style="list-style-type: none">Analytical instrumentation skills for compound identification.	<ul style="list-style-type: none">Synthetic organic chemistry skills, including purification and identification of products.Broad understanding of biology and biological functions	<ul style="list-style-type: none">Teamwork and interpersonal skills are required. In most cases a large, interdisciplinary team will decide which compounds should be synthesized and tested, so the medicinal chemist needs to work well with everyone on the team.Communication skills—medicinal chemists often have to write reports and present the results of their research. They need to be able to communicate clearly with other chemists, with other types of scientists, and with nonscientists.

and how drugs
work.



Career Path

Many medicinal chemists start out in the lab and then move on to other laboratory career such as process chemistry, formulation chemistry, quality control or quality assurance. They may also move to nonlaboratory careers such as regulatory affairs, intellectual property (patents), project management, or technology transfer.

Professional Organizations

- [ACS Division of Medicinal Chemistry \(ACS MEDI\)](#)
- [Professional Societies for Pharmaceutical Research](#)

Labor Statistics

- [Labor Statistics - Pharmacists](#)
-



Future Employment Trends

The outlook for this field is mixed due to changing economy and government health care reform regulations. Pharmaceutical companies have been downsizing their research labs, merging with other companies, and outsourcing research for many years. Some outsourcing has also taken place overseas, reducing opportunities for domestic pharmaceutical jobs. Small companies and contract research firms are some of the more promising places for employment in medicinal chemistry.



Is This Career a Good Fit for You?

Medicinal chemists must enjoy varied activities and be excited about exploring the unknown. A good imagination and persistence are also two important qualities to have when considering a career in medicinal chemistry. Being a team player with good written and verbal communication skills are invaluable assets when interacting with scientists from other disciplines. Knowing that your work is helping to improve human health and reduce suffering is a strong motivating factor for many in this field.

Articles

- [ACS Medicinal Chemistry Letters](#)

Opportunities

Pharmaceutical companies have been downsizing their research labs or merging with other companies. Meanwhile, some government agencies are looking for chemists to fill nonlaboratory chemistry positions. Some outsourcing has also taken place overseas, reducing opportunities for domestic pharmaceutical jobs.

Education

- Pharmaceutical companies hire people with research experience, advanced degrees (especially in organic chemistry), and at least two years of postdoctoral experience
- Most chemists in traditional research careers have a Ph.D.
- Research technicians have B.S. degrees

Salaries

- Median annual wage: \$82,240 (2015)

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