

Biochemistry

The study of the chemical processes that govern how living organisms work



Understanding the chemical properties of biomolecules is fundamental to modern biology

Biochemists investigate the structure, function and interaction of biological molecules such as proteins, DNA, RNA, carbohydrates and lipids.

Understanding the chemical properties of these large and complex molecules helps explain how living systems work.

Why is it important?

Some of the greatest breakthroughs in modern science have been in biological chemistry – for example, the discovery of the structure of DNA, and how it encodes instructions for development in all living organisms. Complex chemical processes are at the heart of all biological systems, from the replication of genetic information, to energy production, to the immune system – and therefore almost all branches of the life sciences depend on an understanding of biochemistry.

Synthesising biological molecules artificially is not only tremendously useful in medicine, but can also help us to understand how the very first life on Earth formed spontaneously from non-living material billions of years ago. Biochemistry is now very much an umbrella term for

many more specific fields of biology, such as genomics, proteomics, metabolomics, synthetic biology and systems biology.

What careers are available?

Biochemists are employed in a huge variety of roles across the public sector, industry, and academic research. Biochemists are particularly important in healthcare, analysing samples for the health service and helping to develop treatments with pharmaceutical companies, research institutes and public health laboratories.

Other areas that biochemists work in include forensic science, agriculture, environment, biotechnology, food, energy and waste, or any organisation that requires chemical analysis of biological material.

Fundamental biochemistry research is also helping us find out more about the molecular basis of many diseases like cancer. Related fields such as synthetic biology and genetic engineering will allow us to create new strains of organisms that could help towards world issues such as food security and global warming.

How do I become a biochemist?

Biochemists working in academic research will normally have completed a biochemistry undergraduate degree (or something very similar – for example molecular biology, genetics or biology), followed by a further biochemistry related course of study up to PhD level.

Similarly, postgraduate qualifications are increasingly important for those entering industry or other sectors. Biochemistry graduates are also often employed in publishing and the sales and marketing of drugs and medical technology.

Where can I find out more?

The Biochemical Society is the largest discipline based bioscience society, with 7,000 members. It organises a variety of scientific meetings, resources, and awards and grants for its members, and publishes several journals.

● www.biochemistry.org