

WHAT IS BIOCHEMISTRY

Each part of every living being is biochemically connected.

Biochemistry is at the heart of life science. It is a fascinating, diverse and sprawling discipline; which makes it near impossible to pigeon-hole or define concisely. Many look upon biochemistry as a science that underpins and explains the essential processes of life, impacting on:

- Biotechnology and bioinformatics
- Cell biology and signalling
- Development and disease
- Energy and metabolism
- Genetics
- Molecular biology
- Plant biology

Lubert Stryer, the famous biochemist and author of *Biochemistry* (W.H. Freeman & Co.), states that biochemistry is “rapidly progressing from a science performed almost entirely at the laboratory bench to one that may be explored through computers. Its practical approach applies the molecular aspects of chemistry to the vast variety of biological systems.”

Biochemists:

- Provide new ideas and experiments, essential for understanding how life works
- Support our understanding of health and disease
- Drive the discovery of new ways to use molecular systems and their biological functions
- Contribute essential innovative information to the technology revolution
- Work together as part of a team with chemists, physicists, healthcare professionals, government policy makers, engineers, zoologists, environmental scientists, sales and marketing managers, journalists and other professionals from a variety of different disciplines

Biochemists have high-value jobs that influence work in:

Hospitals, university research departments, agriculture, food institutes, education, scientific law, cosmetic industries, forensic crime research, industrial laboratories, drug manufacturing, biotechnology, publishing, sales and marketing, government administration, science writing and many more...

Biochemists are highly valued members of any company or institution, and their skills and expertise are greatly in demand by a variety of other professionals. Biochemistry is often a collaborative field, requiring biochemists to work and communicate as a team with professionals from a variety of disciplines to achieve their goals.

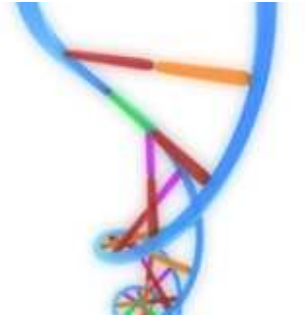
A degree in biochemistry provides many attractive and transferable skills:

Analytical, communication, research, problem solving, numerical, written, planning, Observational, team work, organizational, computational....Good preparation for any Career.

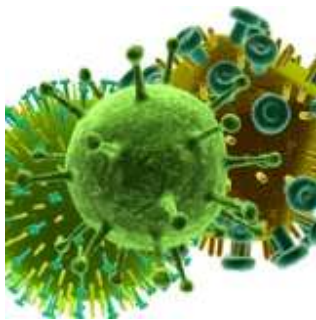
The life science community is a fast-paced, interactive network with global career opportunities at all levels. The UK is at the forefront of research and hosts more than 25% of Europe's life science companies. The Government recognizes the potential that developments in biochemistry and the life sciences have for contributing to national prosperity and for improving the quality of life of the population. Funding for research in these areas has been increasing dramatically in most countries, and the biotechnology industry is expanding rapidly.



From the biochemical bonds linking atoms to form simple molecular structures...



...to larger structures like the double-helix of DNA, that holds genetic information which flows into RNA and then into proteins...



...Biochemistry is all about discovering new biochemical structures and determining their functions and interactions with other molecules.



The field deals with complex molecular machines, metabolic pathways and biochemical communication across cellular structures and throughout organisms.



The research and development of biochemical concepts and techniques in life science and medicine over the past 100 years have been staggering... the opportunities for further discovery are endless.

Biochemistry is the application of chemistry to the study of biological processes at the cellular and molecular level. It emerged as a distinct discipline around the beginning of the 20th century when scientists combined chemistry, physiology and biology to investigate the chemistry of living systems.

Biochemistry is both a life science and a chemical science - it explores the chemistry of living organisms and the molecular basis for the changes occurring in living cells. It uses the methods of chemistry, physics, molecular biology and immunology to study the structure and behaviour of the complex molecules found in biological material and the ways these molecules interact to form cells, tissues and whole organisms.

Biochemists are interested, for example, in mechanisms of brain function, cellular multiplication and differentiation, communication within and between cells and organs, and the chemical bases of inheritance and disease. The biochemist seeks to determine how specific molecules such as proteins, nucleic acids, lipids, vitamins and hormones function in such processes. Particular emphasis is placed on regulation of chemical reactions in living cells.

Because biochemistry seeks to unravel the complex chemical reactions that occur in a wide variety of life forms, it provides the basis for practical advances in medicine, veterinary medicine, agriculture and biotechnology. It underlies and includes such exciting new fields as molecular genetics and bioengineering.

Biochemistry has become the foundation for understanding all biological processes. It has provided explanations for the causes of many diseases in humans, animals and plants. It can frequently suggest ways by which such diseases may be treated or cured. The knowledge and methods developed by biochemists are applied to in all fields of medicine, in agriculture and in many chemical and health related industries.

Biochemistry is also unique in providing teaching and research in protein structure/function and genetic engineering, the two basic components of the rapidly expanding field of biotechnology. As the broadest of the basic sciences, biochemistry includes many subspecialties such as neurochemistry, bioorganic chemistry, clinical biochemistry, physical biochemistry, molecular genetics, biochemical pharmacology and immunochemistry. Recent advances in these areas have created links among technology, chemical engineering and biochemistry.