

MICROBIOLOGY

What is microbiology?

Microbiology is the study of all microscopic organisms, principally bacteria, fungi and viruses. It is concerned with the interactions between micro-organisms and their hosts and is of immense importance in relation to the environment, agriculture and food, medicine and biotechnology.

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What do they do?

Most people know that microbes are the cause of infectious diseases like 'flu, or whooping cough but they don't realise that exploiting microbial activities brings us many benefits. Microbes can make you ill, but they are also the source of the antibiotics that can cure you. Microbiology is a vast subject which overlaps with other life sciences such as genetics, biochemistry, molecular biology and even engineering. Microbiologists can be found at work in many different places but they are normally based in a laboratory. As there are many different types of microbes there are many different types of microbiologists. Food, pharmaceutical, agrochemical, biotechnological, environmental and pollution control companies all need microbiologists to develop new products, monitor the production of existing ones and solve problems.

Hospitals, public health laboratories, research institutes and pharmaceutical companies offer work in diagnosis, prevention and treatment of illnesses caused by microbes. Agriculture, environmental and health specialists study the role of microbes in plant disease, pest control, nutrition and soil fertility, or monitor and control pollution and devise biological treatment of waste. Microbiology is of fundamental importance in the environment, with micro-organisms carrying out many of the processes that cycle elements such as carbon, nitrogen and sulphur in the biosphere. Microbiology is pivotal to solving the challenges we face in the health, food and environmental sectors. Knowledge of microbiology will enable you to improve the quality of our lives in relation to the environment, to fight disease by immunisation and to combat pollution.

As a microbiologist you could...



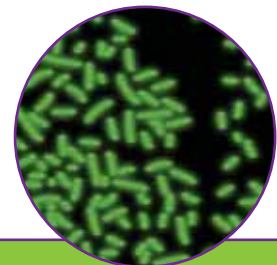
produce novel therapeutic proteins and antibodies



use micro-organisms in recombinant DNA technology



develop more effective chemotherapy or immunisation methods



use organisms as 'cell factories' to make gene therapy agents

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Career opportunities

Microbiology is an exciting and rapidly developing area of the life sciences and underpins much of the molecular biology and medical developments that are revolutionising our lives. It is an integral part of many professions. Recent graduates have been employed in hospital laboratories, the pharmaceutical industry, genome mapping, medical diagnostic development, manufacturing companies, forensic science, education, environmental agencies and journalism. Graduates in microbiology find employment in pharmaceutical and medical research laboratories, as quality control officers in the preparation of drugs, in food processing and packaging or in

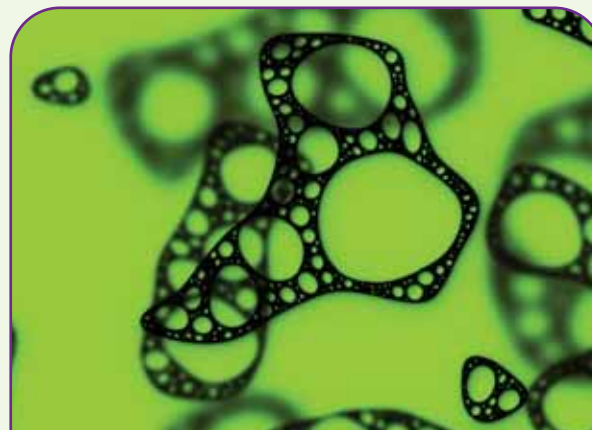
public utilities. Industry employs microbiologists in the manufacture of numerous products, such as pharmaceuticals, chemicals, cosmetics, food and drink, either because microorganisms are used in the process or for reasons of microbiological safety and hygiene. Many other industrial concerns have requirements for graduates in biological disciplines in such areas as environmental protection, quality control of starting materials, in-process and finished product monitoring. The multidisciplinary nature of microbiologists' training means that they find employment in a wide variety of positions.

Did you know?



Battling infectious disease

Sixteen million people worldwide die from infectious disease every year. In the developed world, antibiotic resistance amongst bacteria is increasing and 'new' micro-organisms, such as the viruses causing HIV and SARS, pose threats on a global scale. All these problems require a broad understanding of microbiology if the opportunities offered to solve them are to be grasped.



Too many bugs

Food-spoiling bugs can munch away on vegetables without causing any damage as long as there aren't too many of them. But once their population grows to about 100 million bacteria per gram, they release enzymes to get extra nutrients and it is these enzymes that make the vegetables go off.