bbsrc
biotechnology and biological sciences research council

What is Nano?

A **nanometre** is one thousand millionth of a metre.

A human hair is 80,000 **nanometres** wide.

Nanotechnology is about using and making materials and devices at this tiny scale.

An everyday example is sunscreens that contain nanoparticles of zinc oxide and titanium dioxide to block UV light.

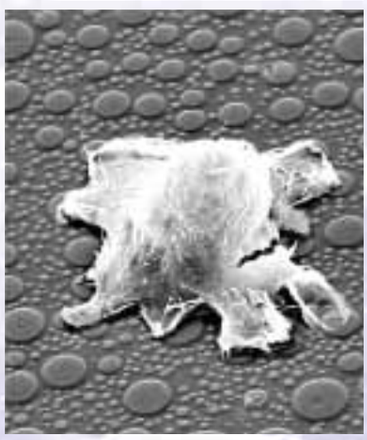
The UK is at the forefront of developing nanotechnologies.

Researchers are working to learn more about the properties of materials at the nanoscale and to use this information in applications ranging from tissue replacement surgery, to novel sensors and 'packages' for delivering medicines to their site of action in the body.

BBSRC invested around £20M in nanotechnology research in 2004. Here we introduce some of the applications and issues surrounding this new science.

Tissue engineering is about replacing and repairing diseased tissue with living cells. To do this, scientists and surgeons will need to be able to introduce cells in a controlled way that enables them to grow and function normally in their new environment.

Researchers at the University of Glasgow are exploring how cells respond to nanoscale contours in their environment. By creating nanoscale 'pits' and columns in tissues in the laboratory, they can follow how different landscapes affect the growth and behaviour of human cells. Nanoscale features in a cell's environment can alter its shape, and this in turn can affect activity inside the cell.



How do we hear?

Insect ears are very simple compared to ours but they work on the same basic principles. Studying the 'ears' of mosquitoes, fruit flies and locusts is helping scientists at the University of Bristol to solve one of nature's big puzzles - how energy in sound waves is converted into mechanical vibrations in 'ears', enabling us to hear.

Working at the nanoscale, the research team hope to use the information to mimic this natural phenomenon in novel sensors that would be able to detect and respond to tiny sounds that cannot be trapped by conventional techniques.

Nano and Us

Like all new areas of science, nanotechnology raises issues, for example about regulation, applications and safety. BBSRC supports projects that investigate public attitudes to nanotechnology including:

Nanodialogues, a project led by DEMOS (a thinktank). Two research councils, BBSRC and EPSRC, will be inviting members of the public to discuss how basic research on nanotechnology is funded, how decisions are made and who makes them.

Nanojury UK, led by PEALS (run in partnership with Greepeace UK, The Guardian, the IRC in Nanotechnology at the University of Cambridge). Twenty members of the public considered the issues surrounding nanotechnologies and questioned a range of experts. Their recommendations include:

- greater transparency when public money is spent on nanotechnologies
- more public involvement at the key stages of the development of technologies
- using nanotechnologies particularly to tackle health and environmental problems
- proper labelling of products developed using nanotechnologies

For further information please see:
www.bbsrc.ac.uk