

LATEST NEWS**Molecular machine closer to reality**

A new breakthrough has brought the sci-fi world of molecular machines closer to reality.

Scientists have built molecules that can for the first time move "large" objects.

The research could eventually lead to the development of artificial muscles to perform physical tasks.

Molecular machines could also find their way into "smart" materials that change their properties in response to outside stimulus. They could even control the movement of drugs around the body to the exact point where they are needed, say scientists.

University of Edinburgh researchers used light to stimulate man-made molecules to propel small droplets of liquid across flat surfaces and up slopes. The team, led by Professor David Leigh, covered a gold surface with specially engineered molecules. When stimulated with ultra-violet light, the components of the molecules shifted position. These changes dramatically altered the surface tension of liquid droplets placed on the gold surface.

In this way enough energy was produced to move the droplet a distance of up to a millimetre. Although the movement is tiny, it represents a great technological leap in the new emerging field of nanotechnology.

Prof Leigh told the BA Festival of Science at Trinity College, Dublin: "Nature uses molecules as motors and machines in all kinds of biological and chemical processes. Although man's understanding of how to build and control molecular machines is still at an early stage, nanoscale science and engineering could have a life-enhancing impact on human society comparable in extent to that of electricity, the steam engine, the transistor and the internet."

Nanotechnology is the manipulation of materials at scales of a millionth of a millimetre.

The molecular machines built by Dr Leigh's team resemble tiny rods, each one 80,000th the width of a human hair. The rods have

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rings that slide up and down them. Shining the light causes the rings to shift position. In the experiment being reported, this alters the properties of the surface on which the rods are placed, causing the droplet to move.

But Dr Leigh said it may in future be possible to create an artificial muscle by joining the rods together. Real muscles operate using natural biomolecular machines. Molecular rods slip past each other to create the force that makes a muscle contract. The same effect could be generated artificially using the sliding rings, said Dr Leigh.

TECHNOLOGY VOTE

Would you be happy to carry an identity card?

- Yes, it will make it easier for Police to keep track of criminals, underage drinkers and tackle terrorism
- No, I think it is against my civil liberties
- Don't know