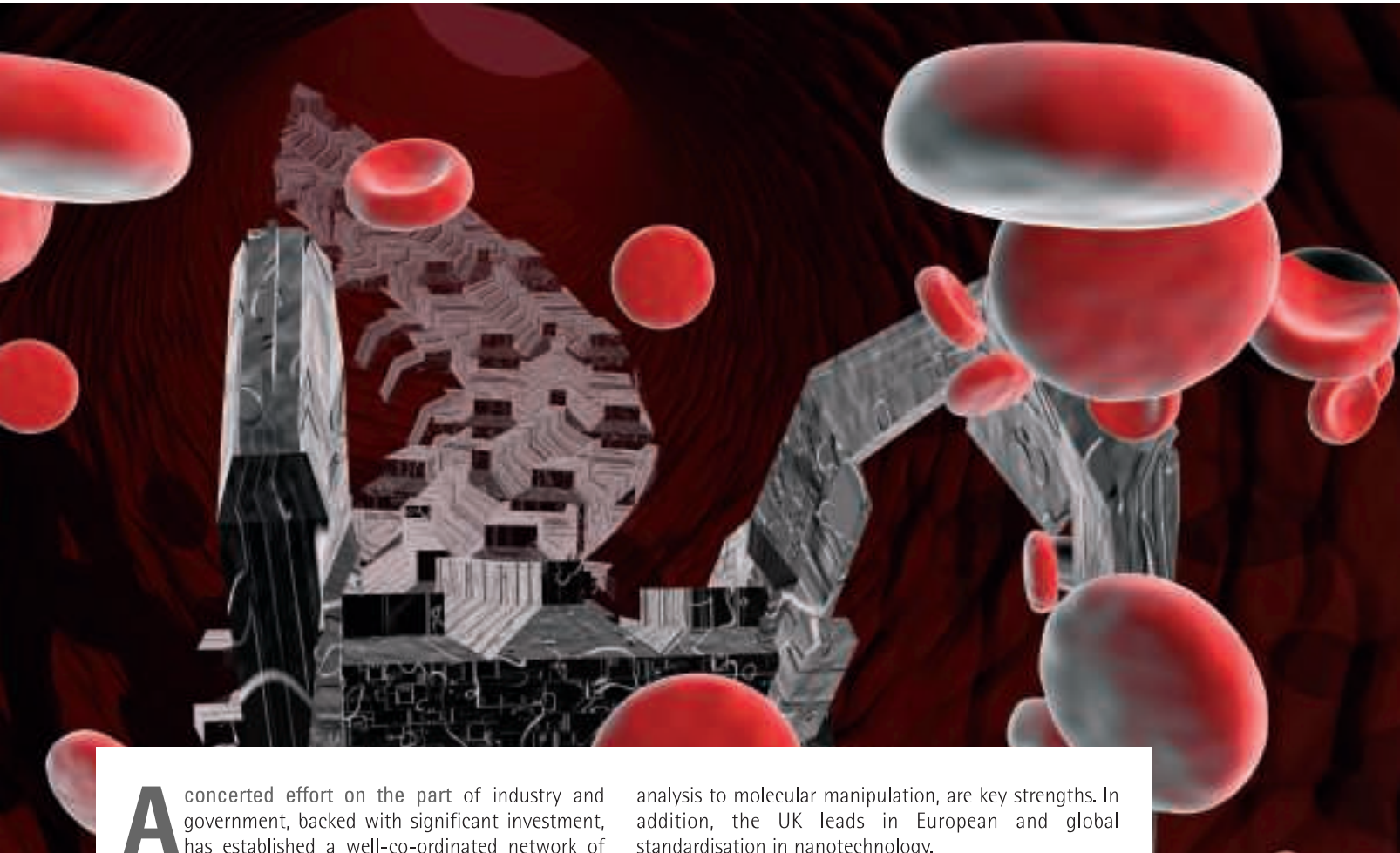


Nanotechnology

Today, the UK is working at the cutting edge of the nanotechnology revolution and the sector has made huge strides in recent years



A concerted effort on the part of industry and government, backed with significant investment, has established a well-co-ordinated network of companies that are developing and manufacturing technologies and materials on the nanometric scale.

The sector is supported by a world-class academic community, whose research is consistently bearing the fruit of powerful new technologies. These are providing a demonstrable competitive edge in a range of engineering industries, including the defence, automotive, power generation, chemicals and materials sectors.

Prototyping and production processes pioneered in the UK are enabling the world to discover and harness the properties that nanomanipulation can unlock. The sector's breadth and extensive infrastructure of research and manufacturing facilities position the UK as the ideal place for companies from across the world to form commercial partnerships in order to identify and demonstrate breakthrough technologies.

The UK is also supporting the global nanotechnology revolution through its internationally recognised instrumentation and analytical industry infrastructure. Metrology tools, which are critical to the advancement of nanotechnology activities from surface and particle

analysis to molecular manipulation, are key strengths. In addition, the UK leads in European and global standardisation in nanotechnology.

UK EXPERTISE

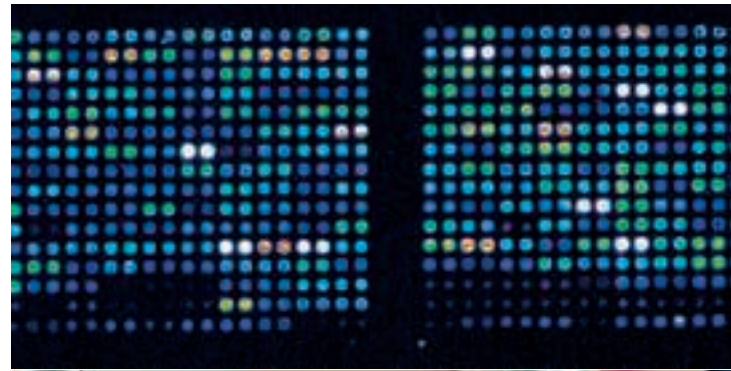
The field of nanomaterials and bulk nanomaterials production is a key area of expertise in the UK. Products and processes developed in this field offer significant advantages to a wide range of engineering industries.

In the field of nanopowders, for example, two UK companies have developed a flexible and scaleable process for the bulk production of nanopowders that have a range of applications, from protective coatings to catalysts. The process involves vaporising feedstock material in a plasma stream, then quenching it to form discrete nanoparticles. Categories of material which can be produced consistently in a regular form and in bulk quantities include oxides, carbides, nitrides, metals and layered or doped materials.

Nanomaterials made in the UK, including nanoparticles, nanopowders, carbon multi-wall nanotubes, nanowire and quantum dots, underpin much of nanotechnology-enabled industry. Nanocomposites are also commonplace in the production process. The automotive industry is a ➡



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prime adopter of nanotechnologies, and experts in the UK are working on a range of products aimed at its needs. These include chrome replacement technology; high-strength, lightweight components; wear-resistant coatings; fuel-borne nanocatalysts for the reduction of engine emissions; fuel-cell catalysts; new cooling fluids; hydrogen storage for fuel cells; and electrochromic glasses and paints.

The UK is also making breakthroughs with the application of nanotechnology in the fields of textiles, coatings, sensors, packaging and product security. Products include smart textiles, shape-memory polymers, self-cleaning fabrics, antibacterial and self-cleaning coatings; hydrophobic coatings; nanocomposite magnetic materials for tag sensors; nanofluids for improved heat transfer; and fatigue-resistant materials among many others.

UK NANOTECH NETWORKS

A distinctive feature of the UK nanotechnology industry is its highly effective micro and nanotechnology strategy, implemented by the Micro and Nanotechnologies

Network (MNT). MNT facilities provide commercial access to over \$1 billion of technical infrastructure at a co-ordinated network of UK centres of excellence in nanotechnology. Available to companies globally, this network enables commercial partners to identify and demonstrate breakthrough opportunities to improve businesses' competitiveness through nanotechnology. Comprising the UK's leaders in the sector, MNT offers innovative, value-adding solutions and access to nanotechnology products, processes, enabling tools and knowledge. System integration, prototyping, production foundries and packaging facilities are all available.

This 'lab-to-market' strategy means that the UK is ideally placed to develop ideas rapidly into innovative, market-leading products, processes and applications. ■

i FOR MORE INFORMATION

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