SCIENCE FOR A HEALTHY NATION

ABOUT EPSRC

The Engineering and Physical Sciences Research Council (EPSRC) invests £800 million a year in research and postgraduate training.

Our investments support four inter-linked outcomes – Connectedness, Productivity, Resilience and Health – which collectively underpin UK prosperity. We also support highly skilled individuals with the potential to become leaders in industry, the public sector and academia. Stable, long-term investment:

- Gives researchers the best environment for ideas and innovation to flourish
- Attracts significant leverage on public investment
- Leads to new jobs, products and services, facilitating growth
- Benefits society and improves the quality of life in the UK

Our mental and physical wellbeing affects our quality of life, the resilience of communities and national productivity.

Advances based on new research in the engineering and physical sciences will revolutionise our ability to manage our own health, help us to maintain healthier behaviours and environments, and transform the way care is delivered.

Novel technologies and materials will continue to improve our ability to predict, diagnose and treat disease. Research will lead to better quality of life and higher standards of affordable care, and will drive UK growth through new products and services.

STEM CELL MANUFACTURE BRINGS OVER £20 MILLION IN SALES

Human stem cells are key to regenerative therapies that replace or regenerate diseased or injured cells, tissues and organs. Since 2003 EPSRC-supported researchers at Loughborough University have worked with industry to create future manufacturing systems to enable large-scale production of human stem cells.

The research, development and demonstration of consistent, optimised, automated expansion in the culture of human stem cells at Loughborough has led to over £20 million in sales of systems to companies developing stem cell-based and other therapies.

The systems' use is contributing to the health and quality of life of patients while creating a new industry sector with significant economic and employment benefits.

SOFTWARE COULD SAVE £0.5 BILLION

£320,000

already saved by one NHS Trust

Pioneering Artificial Intelligence techniques developed by EPSRC-supported researchers at the University of Reading and Goldsmiths, University of London, working with @UK PLC, have led to ground-breaking software which pinpoints potential NHS savings by combining and mining purchasing data across systems and formats.

The SpendInsight software was used in an analysis for the National Audit Office, which showed that the NHS could save over £0.5 billion in consumables expenditure through simple changes to purchasing practice. One Trust has already saved £320,000.

£0.5 BILLION

potential savings in NHS consumables expenditure

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BACTERIA-RESISTANT STEEL SURFACES

Materials scientists at the University of Birmingham, led by Professor Hanshan Dong, have devised a way of making stainless steel surfaces resistant to bacteria.

By introducing silver or copper into the steel surface (rather than coating it on to the surface), the researchers have developed a technique that not only kills bacteria but is also very hard and resistant to wear and tear during cleaning.

Bacteria-resistant surfaces could be used in hospitals to prevent the spread of superbug infections on stainless steels surfaces, as well as in medical equipment, for example, instruments and implants. The technology could also be adapted for use in the food industry and in domestic kitchens.

3D PRINTING OF DRUG THERAPIES

University of Nottingham scientists and colleagues from EPSRC Strategic Partner, AstraZeneca, have proved in principle the use of 3D inkjet printing technology that could lead to 'printed' drugs exactly tailored to individual patients' needs.

The printer uses a piezo-electric inkjet head, similar to the kind found on desktop paper printers we use at home.

The team suggest that the 'formulation printer' of the future could use cartridges supplied by the pharmaceutical industry to print out the patient's specific dosage – mixing and matching the drug combinations with accuracy to the nearest nano-drop as the inkjet printer builds the prescription layer-by-layer.

The printer could be linked via the internet to the appropriate healthcare provider, as well as to the patient's medical records, enabling individualised dosages to be printed, monitored, and modified remotely.

Doctoral students from the EPSRC Centre for Doctoral Training in Targeted Therapeutics at the University of Nottingham played a vital role in the project.

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