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CELL-SQUIRTING NEEDLES COULD WEAVE NEW ORGANS

A new approach to "printing" living cells could make it easier to arrange them into precise structures without harming them. This could enable future therapies where replacement limbs or organs can be printed to order.

The most advanced form of bioprinting borrows technology from the office. A solution of cells dubbed "bioink" is used in standard inkjet printing heads to make layers of cells on the microscale. But the technique gives a limited degree of precision.

University College London is developing an alternative approach, called Pressure Assisted Spinning. Three needles nested inside one another separately deliver cells, a viscous polymer, and pressurized air. The cells and polymer mix are drawn out and mixed by the pressurized air, explains Susan Jayasinghe.

Because the polymer is viscous, it does not break up into droplets but flows out in a continuous stream of sticky thread like spider silk. Living cells are spaced along the 50-nanometere-wide thread's length. Cells are handled gently because they are delivered by a relatively wide needle—the thread is shaped by air pressure, not mechanical force.

Scanning the needle across a surface can build up a flat sheet of the material (see image,) doing that over a 3D shape can produce a scaffold of cells ready to grow into any shape, for example, a particular bone or piece of tissue. Jayasinghe thinks sheets of the material might be useful externally as bandages.

Source: NewScientist.com
<http://technology.newscientist.com/article/dn12780-cellsquirting-needles-could-weave-new-organs.html>

THE FUTURE OF BIOMEDICINE: VIRTUAL HUMANS

Scientists at Johns Hopkins University have recently provided a sneak preview of the future of biomedicine with a range of projects seeking to assemble virtual humans--or parts of them--on computers and "labs on a chip." The technology could usher in a new era of personalized medicine in which rapid tests tell doctors which treatments have the best chances of success.

Source: MSNBC
<http://www.msnbc.msn.com/id/23447395/>

ROBOTIC HELPING HAND

A new robot from Georgia Tech understands commands given using a simple tool: an off-the-shelf laser pointer. In a demonstration video, a person reclining in a chair flicks on a green laser and trains it on a cordless phone on the floor a few feet away. A thin, five-foot-seven-inch robot called Elevated Engagement, or EI-E for short, fixes on the phone, wheels over, grips it, and brings

it back to the user in a robotic version of fetch.

Source: MIT Technology Review:
<http://www.technologyreview.com/Infotech/20453/>

LOCKHEED MARTIN TO DEVELOP OBJECT RECOGNITION

The Defense Advanced Research Projects Agency (DARPA) and the National Geospatial-Intelligence Agency awarded Lockheed Martin a \$4.9-million, 18-month program to use brain-inspired technologies to develop a system that will speed an image analyst's job by 100 times. Called Object Recognition via Brain-Inspired Technology (ORBIT), the system will use electro-optical, light detection and ranging (LIDAR), and brain inspired technologies to automatically recognize objects in urban environments from ground and aerial surveillance. ORBIT will fuse commercial airborne sensor data into a three-dimensional, photorealistic model of the landscape. Its brain-inspired object recognition technology will automatically generate lists of recognizable imagery, like mailboxes and dumpsters.

Source: CNN Money October 11, 2007
<http://money.cnn.com/news/newsfeeds/articles/prnewswire/NETH01611102007-1.htm>

AMERICA'S BRIDGES FALLING DOWN

According to a 2005 study by the American Society of Civil Engineers, 27.1 percent of the nation's bridges are either structurally deficient or functionally obsolete—a total of more than 160,000 bridges. The estimated cost to repair these bridges is almost \$10 billion a year over the next 20 years.

Source: American Society of Civil Engineers

WEAVING BATTERIES INTO CLOTHES

Researchers have developed technology that combines multiple materials into intricately structured fibers. The researchers hope to make fibers that can store energy or convert sunlight into power, for use in soldiers' uniforms. A machine, manufactured by Hills, of West Melbourne, FL is one of only two in the world capable of producing such fibers.

Source: <http://www.technologyreview.com/Nanotech/19487/>

ARTIFICIAL CORNEA COULD END BLINDNESS

A novel artificial cornea that adheres to eye cells could bring new hope to the estimated 10 million people worldwide who are blind because of corneal damage or disease.

The key to the new implant is a protein-coated polymer developed by researchers at the Fraunhofer Institute, in Munich, Germany. The polymer, which is commercially available, repels water, so it won't absorb tear-duct secretions that could cause it to swell. It also prohibits cell growth, so natural tissue will not cloud it over.

Source: MIT Technology Review
<http://www.technologyreview.com/Biotech/19490/>

NEW PLASTIC IS STRONG AS STEEL

By mimicking a brick-and-mortar molecular structure found in seashells, University of Michigan researchers created a composite plastic that's as strong as steel but lighter and transparent. The researchers created this new composite plastic with a machine they developed that builds materials one nanoscale layer after another.

The robotic machine consists of an arm that hovers over a wheel of vials of different liquids. In this case, the arm held a piece of glass about the size of a stick of gum on which it built the new material.

Source: Physorg.com <http://physorg.com/news110727530.html>

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