

Laser Beams Sort Stem Cells

Measuring the "stretchiness" of cells using a new laser technique promises to pinpoint human stem cells in blood and distinguish cancerous cells from benign ones, say researchers.

Using an "optical stretcher", which pushes and pulls individual cells to measure their elasticity, Josef Käs and Jochen Guck from the University of Leipzig in Germany successfully separated adult stem cells from human blood.

They say they can also pick out cancerous cells from biopsies as small as just 50 cells--traditional

methods need between 10,000 and 100,000 cells to give a diagnosis. Furthermore, the researchers say this is the first test able to identify metastatic cancer cells--those which are prone to spreading through the body to form secondary tumours--without actually locating any metastatic tumors.

"We have developed a very good way to recognise different cells based on something known since the 1950s--that very different cells have very different skeletons," says Käs.

He says the optical technique developed by the team is relative-

ly simple and low cost, yet could offer a highly specific way of identifying stem cells, with the added benefit of a high throughput. "Sometimes the simple ideas are the ones people overlook," he told New Scientist, adding that its simplicity is the reason for its broad applications.

The new technique could lead to advances in medical treatments, says Michael Watts, a haematology and stem cell expert at University College London, UK. "We could significantly add to our knowledge of stem cell biology, [adding the search for] cellular therapies," he says.

Smart Lenses to Halt Short Sight

Scientists have designed special contact lenses that could help make short-sightedness a thing of the past, BBC News website reported.

The custom-made lenses are intended to correct problems with focusing which eye experts blame for progressive short vision, or myopia.

A team at Anglia Polytechnic University will test whether the lenses can prevent people's myopia getting worse.

The ultimate aim is to give myopia-prone children the lenses to wear from the age of five.

This should stop them encountering any short-sightedness later on and eye diseases linked with

myopia, such as cataracts and glaucoma.

Short-sightedness is caused by the inability of the muscles in the eye to flatten the lens enough to focus light from distant objects directly on to the retina.

Instead, the point of focus is in front of the retina, leading to a blurred image.

Glasses correct the problem by moving the focal point back onto the retina.

However, even when wearing glasses, short-sighted people cannot always focus very accurately on things, particularly when they are close up, said lead investigator and optometrist Professor Daniel O'Leary.



Short-sightedness is caused by the inability of the muscles in the eye.

Smoking's Asthma Timebomb

Women who smoke during pregnancy could be creating an asthma timebomb for their grandchildren, ananova.com said.

A new US study has found that a child whose grandmother smoked when pregnant

has double the risk of asthma.

A team at the University of Southern California studied the health of 1,000 children under the age of ten.

They found that if a mum smoked when pregnant, her children were 1.5 times more

likely to develop asthma by the age of five.

But if the gran smoked, they were twice as likely to suffer.

If both mother and grandmother smoked, the risk was 2.5 times greater.

Dr Frank Gilliland said, "This is the first

study to show that if a woman smokes while pregnant both her children and grandchildren may be more likely to have asthma.

"Smoking could have a long-term impact on a family's health that's never before been realised."

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Nickel Nuclei Yield Magic Finding

Physicists in the US and Germany have measured the half-life of the "doubly-magic" nucleus nickel-78 for the first time and have found that it is shorter than expected. Nickel-78 is a highly stable nucleus that is thought to produce about half the elements heavier than iron in the universe, PhysicsWeb.org reported.

The finding, obtained by Paul Hosmer of Michigan State University and colleagues, could mean that supernova explosions produce gold and other heavy elements much faster than previously thought.

With 50 neutrons and 28 protons, nickel-78 has the largest excess of neutrons of any naturally occurring isotope. Nickel-78 is said to be a "doubly-magic" nucleus because it has closed shells of both protons

and neutrons.

It is as a ten such highly stable and one of only ten such nuclei that can be formed in nature. It is also very difficult to produce experimentally. Although physicists at the GSI lab in Darmstadt, Germany, had produced three nickel-78 nuclei before, they were not able to measure their properties. Working at the National Superconducting Cyclotron Laboratory at Michigan State University, Hosmer and colleagues first fired a beam of stable krypton into a beryllium target. The krypton fragments to produce many exotic neutron-rich isotopes.

About twice a day, one out of ten billion attempts per second produces a nickel-78 nucleus. This isotope was separated out and its decay half-life measured to be about 110 milliseconds, which is

about four times shorter than nuclear theories predict.

According to some models, the decay of nickel-78 is part of the so-called "rapid neutron capture process" or r-process, which is thought to produce about half the elements heavier than iron in the universe. The r-process is the main source of elements such as gold, platinum and uranium and may take place in supernova explosions.

More importantly, nickel-78 is one of the main bottlenecks in this process and acts like a valve for the build-up of heavier elements. The new shorter half-life for the isotope means that the r-process could be creating gold and other heavy elements much faster than previously thought. The finding could force existing models for the synthesis of heavy elements in the universe to be modified.

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