

A year in medical science: stem cells, Star Trek and steroids



AARON HARRIS/TORONTO STAR

Stem cell researchers Bill Stanford, left, Cheryle Seguin and James Ellis of the Research Institute at Sick Children's Hospital, are shown with an incubator of reprogrammed human cells at Sick Kids this week. (Nov. 19, 2008)

RESEARCHING GOOD HABITS

If you're already wavering on that New Year's exercise resolution, you may be smarter if you just keep at it.

Literally.

New research in 2008, showed that exercise — a year-end resolution staple — can actually forge connections between brain cells and keep those critical neurons healthier.

Thus, along with all its other benefits, both medical and aesthetic, exercise can actually make you smarter.

The findings came out of Alzheimer's research, where scientists have been looking for ways to preserve and strengthen the brain against the degenerative, memory-robbing disease.

They found that simple exercise and social interaction - things often abandoned with

Alzheimer's onset — could help slow the ailment's progression and actually build and protect brain tissues.

While the reasons to exercise got even better last year, the use of daily vitamin supplements took several more hits.

Late last year a [Harvard University](#) study contradicted earlier research that had touted Vitamins C and E as effective cancer preventers.

Other studies over recent years have also cast doubt on the cancer prevention properties of vitamins B, and E, as well as folic acid and calcium.

The jury, however, is largely still out on these supplemental debates. And since substances like folic acid have a number of known and proven benefits, and since there's little evidence there's any potential harm, taking vitamins after that daily workout might still be a good idea.

Visit our New Year's Resolution [Fitness Guide](#) for everything you need to know about achieving great physical and mental health in 2009.

Canadian researchers made big leaps forward in a year of remarkable medical science

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Here's a look at the major medical advancements of 2008.

STEM CELL RESEARCH

In a much-anticipated leap forward, embryonic stem cells were coaxed to transform into rudimentary heart cells, which were then directed further into three different types of coronary tissue.

The cells, which actually beat a cardiac rhythm in the University Health Network labs where they were created, will have several uses, doctors say. First, they will likely allow for a much clearer understanding of early coronary development, which even today, remains largely a mystery.

Second, the Petri dish tissues will allow researchers to test new drugs for effectiveness or toxicity, said lead study author Gordon Keller, director of the network's McEwen Centre for Regenerative Medicine.

Ultimately, however, the conjured tissues hold out the hope that they will one day be used to repair damaged organs, and eventually, even grow replacement ones.

The work was published in the prestigious journal Nature.

ORGAN REPAIR

In another Toronto first, doctors at the [Toronto General Hospital](#) announced that they had used new technology developed at the facility to [repair a set of donor lungs](#), outside of the body, and successfully transplanted them into a patient.

An advance that could usher in a sixfold increase the number of available transplant lungs, the technique keeps the organs at body temperature, while attached to a respirator, as a bloodless, oxygen carrying solution is pumped through.

Taking place under a Star Trek like, Plexiglas dome, the procedure allows the lungs time to heal themselves from the inflammatory damage that often accompanies the brain death of their original owner. This naturally occurring damage has limited the number of usable lungs to about 10 to 15 per cent of those that could be harvested.

Doctors may also be able to help the lungs along using pharmacological therapies.

PRESCRIBING PRIVILEGES

On the health policy front, many doctors were up in arms after a high-level provincial medical committee recommended that [pharmacists be allowed to dispense and prescribe](#) some of their own medicines in Ontario.

The Ontario Medical Association [strongly objected to the idea](#), raised by the province's [Health Professions Regulatory Advisory Council](#) in November, saying pharmacists were not equipped to make the diagnosis required for prescriptions.

The [Ontario Pharmacists' Association](#) countered that their members would undergo proper training before being allowed to write prescriptions and

that the ailments covered under the new policy would be minor and limited in number.

FERTILE GROUND

In Montreal, researchers were able to [pinpoint a gene that's responsible for ovulation](#), giving scientists anew target for contraception and infertile women new hope for pregnancy.

The gene, known as Lrh1, was found to hold the master switch for the monthly release of eggs from the ovaries, [University of Montreal](#) scientists say.

And tweaking the gene to turn it on may one day allow infertile women to conceive, while turning it off would be an effective pregnancy control.

STEROID-FREE CROHN'S

At the [University of Western Ontario](#), researchers turned the traditional treatment for [Crohn's disease on its head](#).

For decades doctors used bloating and destructive steroids as the first line of defence against the inflammatory bowel disease. Only if these drugs failed, did they turn to other medications that suppress the immune response that causes the body to turn on itself in the autoimmune disease.

In a paper published in the journal [The Lancet](#), however, the Western researchers found that using the backup medications initially produced better control of the disease without the often-debilitating effects of the steroids.

Meanwhile, in its list of top 10 breakthroughs this year, the top journal Science devoted six spots to medical advancements last year.

PARKINSON'S PROGRESS

Included among these, in top spot, was international research in cell reprogramming, which gave scientists "made to order" cell lines that offer ready and abundant models for research into ailments like Parkinson's disease and type 1 diabetes.

Also mentioned was research that sequenced the genomes of various cancers, allowing scientists to see what genetic alterations specific tumours may carry. Studies that used video imaging to follow the dance

of cells in an emerging embryo — giving scientists a better understanding of life's beginnings — also made the Science list.