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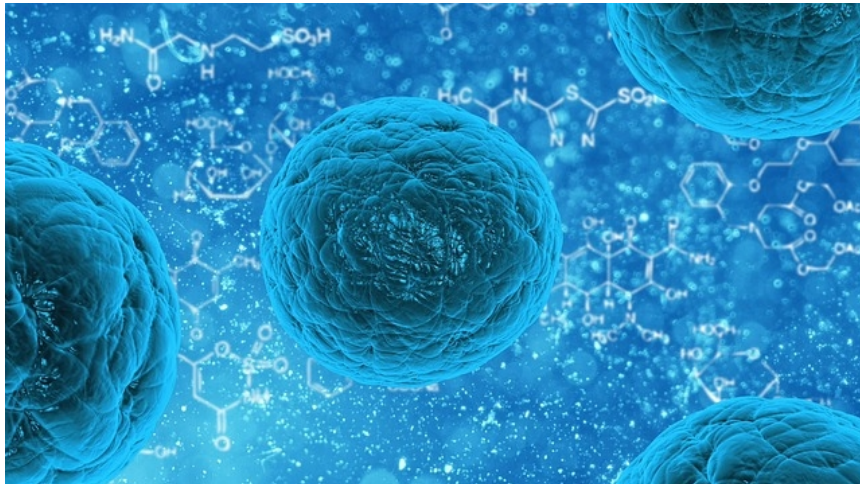


Lions And Tigers And Bears, Oh My!
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Scientists Generate New Human Stem Cells With Single Copy of Human Genome

In a revolutionary development, scientists have succeeded in developing a new type of embryonic stem cell with a single copy of the human genome, instead of the two copies that are normally found in stem cells.

By [Rashmi](#) | Mar 17, 2016 12:42 PM EDT



In a revolutionary development, scientists have succeeded in developing a new type of embryonic stem cell with a single copy of the human genome, instead of the two copies that are normally found in stem cells. (Photo : Pixabay Commons)

Scientists have been able to develop an embryonic stem cell that has just a single copy of the human genome, a development that could help advance research in gene editing, genetic screening and regenerative medicine.

Stem cells typically carry two copies of the human genome.

The stem cells were derived from a female egg and are the first human cells that are capable of cell division with just one copy of the parent cell's genome.

"What is fundamentally new is we have cells that can divide and renew with a single genome. That is just unprecedented," [said](#)

Dieter Egli of Columbia University Medical Center in New York, co-author of the study with Dr. Nissim Benvenisty of The Hebrew University of Jerusalem.

Watch: New Type of Stem Cell Could Help Provide A Model For Early Human Development

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This new development will help advance the understanding of many diseases, including the identification of genetic abnormalities.

The researchers included scientists from The New York Stem Cell Foundation Research Institute. The researchers found the haploid stem cells that could differentiate into other cell types, while retaining a single set of chromosomes.

"This study has given us a new type of human stem cell that will have an important impact on human genetic and medical research," [said](#) Benvenisty. "These cells will provide researchers with a novel tool for improving our understanding of human development, and the reasons why we reproduce sexually, instead of from a single parent."

Reproductive egg and sperm cells are known as haploid cells because they contain a single set of chromosomes. They cannot divide to make more eggs and sperm.

"One of the greatest advantages of using haploid human cells is that it is much easier to edit their genes," [explained](#) Ido Sagi, the Ph.D. student who led the research at the Azrieli Center for Stem Cells and Genetic Research at the Hebrew University of Jerusalem.

Human cells are diploid because they inherit two sets of chromosomes.

To [create](#) the stem cells, the researchers used electricity and chemicals to force an unfertilized human egg cell to divide. As the egg started to divide, it synthesised another copy of its chromosomes to generate diploid cells.

After screening more than 2,000 cells the researchers found only two that were haploid. They showed that it was possible for these haploid cells to divide and turn into other tissues such as heart, brain and gut cells.

"We have two genes of everything and if one is mutated the effect is not so obvious," said Egli in a telephone interview while vacationing in the French Alps. "Because these cells reduce the number of possible combinations and reduce the number of variance, it should be easier to get the answers."

Egli said that the next step would be to modify these haploid stem cells to introduce new disease variances or correct the ones present.

"That should give us a way to better understand those many, many variances that are being identified in genome sequencing efforts that we think have something to do with disease," he said,

The [study](#) appeared on Wednesday in the journal Nature.

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Tags: scientists , Stem Cells , human genome , cell stems , genome human , embryonic stem cells



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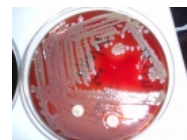
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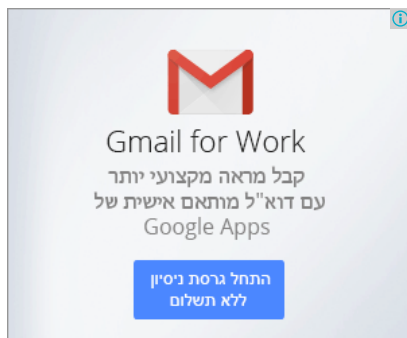
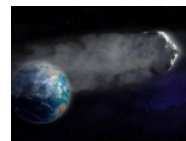
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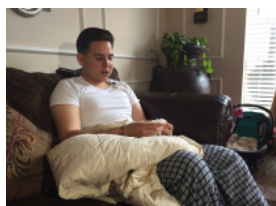
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