Scientists make first artificial virus

Source: http://sci.tech−archive.net/Archive/sci.med/2004−12/2089.html

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Date: 12/18/04

Date: Sat, 18 Dec 2004 16:08:38 GMT

Within ten years we are likely to have decoded DNA of most living things and be able to create any life form by attaching the bases together . Bring back T Rex NOW !!

Scientists use DNA to make virus

The naturally occurring virus does not infect people
US scientists have produced a wholly artificial virus using a method they claim could lead to new lifeforms.
These synthetic organisms − on the scale of bacteria − could be engineered to produce clean energy or mop up pollution, the researchers say.

It is only the second time a virus has been constructed from scratch in the lab, but the new effort is said to produce substantially quicker results.

The work is reported in the Proceedings of the National Academy of Sciences.

First steps

It was conducted at the Institute of Biological Energy Alternatives in Rockville, Maryland, by Dr Craig Venter and colleagues.

Dr Venter was the man who led the private effort to decode the human genome.

He told a news conference on Thursday that being able to make a synthetic virus was just the start of an exercise that would lead to completely artificial or engineered bacteria.

"It's an interim step. Now we have the enabling technology to take us to these next exciting frontiers," Dr Venter said.

For now, "this is basic science at the most basic level with lots of

unknowns".

But he added: "The ability to construct synthetic genomes may lead to extraordinary advances in our ability to engineer micro−organisms for many vital energy and environmental purposes".

To make the synthetic virus, Dr Venter's team assembled and spliced together segments of DNA.

Code errors

The newly constructed microbe is a replica of the phiX virus, which occurs naturally and infects bacteria − not humans.

PhiX was the first organism to have its genetic code read, in 1978. Its genome consists of 5,386 units − or base pairs − of DNA arranged in a small circle.

We have the enabling technology to take us to these next exciting frontiers

Dr Craig Venter

Other researchers had previously synthesised the poliovirus, which is slightly bigger, employing enzymes usually found in cells. But this effort took years to achieve and produced viruses with defects in their code.

In an effort to improve the speed and accuracy of virus building, Dr Venter and colleagues adapted a frequently used technique in genomic science called the polymerase chain reaction (PCR) which is used to copy DNA segments.

The researchers assembled the phiX genome from oligonucleotides − small pieces of single−stranded DNA − and then combined these into the double stands of the complete genome using their new polymerase cycle assembly (PCA) method.

The whole process of building the synthetic phiX took just 14 days.

Works the same

The artificial bacteriophage behaves just like the "natural" one. It has the ability to infect and kill bacterial cells and is indistinguishable from its counterpart.

The scientists say the ability to quickly and accurately synthesise long segments of DNA could help them understand the function of particular genes, and may be a stepping stone to manipulating more complex organisms.

Dr Venter is investigating bacterial organisms to see if they have the potential to meet some of society's energy needs. These microbes might pump out hydrogen to drive electric fuel cells or absorb carbon dioxide to mitigate the effects of global warming.

Scientists envision modifying existing bacteria to improve their performance or constructing artificial bugs to carry out wholly novel tasks.

At the news conference, US Energy Secretary Spencer Abraham called the accomplishment "an extraordinary and exciting development that will speed up our ability to develop biology−based solutions for some of our most pressing energy and environmental challenges".

"With this advance it is easier to imagine, in the not−too−distant future, a colony of specially designed microbes living within the emission−control system of a coal−fired plant, consuming its pollution and its carbon dioxide, or employing microbes to radically reduce water pollution or to reduce the toxic effects of radioactive waste."