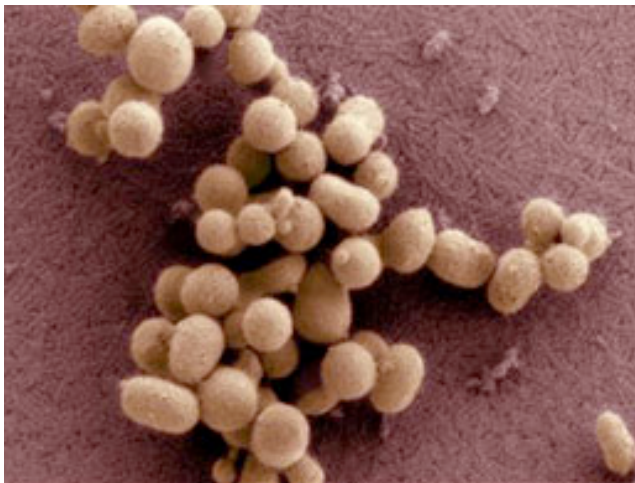




# US team creates first 'synthetic life'

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Life in a test-tube

WASHINGTON (AFP) - US researchers have developed the first self-replicating bacteria cell controlled by a synthetic genome, in a breakthrough which raises new issues about recreating life in a test-tube.

"This is the first synthetic cell that's been made," said lead researcher Craig Venter, unveiling the culmination of 15 years of research.

"We call it synthetic because the cell is totally derived from a synthetic chromosome, made with four bottles of chemicals on a chemical synthesizer, starting with information in a computer."

The team said it now hopes to use the method it has developed "to probe the basic machinery of life and to engineer bacteria specially designed to solve environmental or energy problems."

The method could be used to design bacteria specifically to help produce biofuels or to clean up environmental hazards, said the study carried out by the J. Craig Venter Institute, and published in the journal *Science*.

Potential applications include producing algae to clean up carbon dioxide, one of the main greenhouse gases blamed for global warming, or making new clean energy hydrocarbons for refineries.

Researchers also hope to work on techniques to speed up the production of vaccines and to make new food ingredients and chemical substances.

"This becomes a very powerful tool for trying to design what we want biology to do. We have a wide range of applications (in mind)," said Venter, co-author of the first sequencing of the human genome in 2000.

The researchers synthesized the 1.08 million base pair genome of the bacterium *Mycoplasma mycoides* -- which commonly causes mastitis in goats -- created from four bottles of the chemicals which make up the components of DNA.

They also added DNA sequences to "watermark" the genome to distinguish it from a natural one to stem the controversy about the possibility of creating life from scratch in a test-tube through a chemical process.

They had also imprinted the names of 46 authors and scientists who worked on the project on the genome along with its own website address -- so that anyone who decodes it can send an email to the team.

The "watermarks" also include three sets of quotations including "to live, to err, to fall, to triumph, to recreate life out of life" from Irish author James Joyce.

Venter told a press conference that the team had started with a living cell, which had been transformed with the synthetic genome, adding the cell had gone through a "million steps of replication" and was now frozen in a freezer.

"This is an important step we think, both scientifically and philosophically. It's certainly changed my views of the definitions of life and how life works," he added in a statement.

Throughout the research, the team had engaged in discussions about the ethical implications of their work, he said.

But Canadian international technology watchdog ETC Group warned the Venter Institute had opened "a Pandora's Box."

The synthetic cell "is not a one-stop shop for all our societal woes," said the group's director Pat Mooney. "It is much more likely to cause whole new set of problems governments and society are ill-prepared to address."

Venter's team announced in 2008 that it had chemically synthesized a bacterial genome, but it was unable to activate that genome in a cell at that time.

Now the team had managed to "boot up" the synthetic genome to create the first cell controlled by a synthetic genome.

But Jim Thomas from the ETC Group warned: "Synthetic biology is a high-risk, profit-driven field, building organisms out of parts that are still poorly understood.

"We know that lab-created life forms can escape, become biological weapons and that their use threatens existing natural biodiversity."