

LIFE'S MYSTERY DEEPENS

Evolution theory put to test

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A recent study on the origin of life conducted by the Department of Genetics and Microbiology at Universitat Autònoma de Barcelona (UAB) contradicts the long held belief that life on Earth originated from a system of self-catalytic molecules.

Self-catalytic molecules are capable of going through Darwinian evolution without the need for RNA or DNA and their process of replication. Published in the Proceedings of National Academy of Sciences, the researchers of the new theory explain that these complex chemical networks cannot be considered as evolutionary units. Because research has found out that they lose properties that are essential for evolution once they reach a critical size and a higher level of evolutionary complexity.

The emergence of life, especially human life, in the universe is much more than a random event as it required the presence of right things at the right places and at the right time. We know, the presence of four chemical elements carbon, oxygen, nitrogen and phosphorus are crucial to life's origin. But only hydrogen and helium were formed immediately after the Big Bang. Before more complex elements essential for the sustenance of life could form, stars came into existence. The stars forged those elements in their fiery interiors. Then they ran their natural course of life before releasing them into space. And in order to allow these elements to evolve, the balance between the four forces of Nature had to be right. And it took 13 billion years or so for the universe to allow these elements to come together in an environment where



Evolution revisited

life could finally develop and sustain.

There are two biochemical theories on the origin of life here on Earth. The first one focuses on genetics with RNA or DNA replication as an essential condition for the success of Darwinian evolution. The other one focuses on metabolism. At the beginning of 20th century, Dr. Alexander Oparin established the "Metabolism First" hypothesis to explain the origin of life, emphasizing the primary role of cells as small drops of coacervates (evolutionary precursors of the first prokaryote cells which are thought to be the first living thing ever to exist on Earth). Later it was scientifically demonstrated that sets of chemical components store information about their composition which can be duplicated and transmitted to their descendants, a process referred to as "compound genomes".

But the researchers of UAB in this study which involved rigorous analysis using combinations of numerical and analytical simulations revealed that these systems are incapable of undergoing a Darwinian evolution. The study demonstrated that the dynamics of the molecular compound populations, which divide after having reached a critical size, do not actually evolve. On the contrary, during this process, the compounds lose properties which are essential for Darwinian evolution. The researchers concluded that considering the difference in Pre-Biotic Earth scenarios, this particular fundamental limitation of "compound genomes" must be considered as a caveat against theories that consider "metabolism first" as the starting point of life.

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NEW FINDINGS



Peering into soy's DNA structure

Soybean genome decoded

SCIENTISTS recently unveiled the genome of the soybean, saying it was an achievement that should deepen understanding of one of the world's most important crops, help to boost yields and defend the plant against pests.

The study, published by the British weekly science journal Nature, provides a springboard for research into soy's DNA structure and protein-making machinery, its authors said.

Eighteen organisations, most of them American, teamed up in a 15-year endeavour that yielded a draft of 85 percent of the soybean's 1.1 billion base pairs, the "rungs" in the double-helix ladder of DNA.

"Soybean and other legumes play a critical role in global food security and human health and are used in a wide range of products, from tofu, soy flour, meat substitutes and soy milk to soy oil-based printing ink and biodiesel," said Molly Jahn, deputy under secretary at the US Department of Agriculture.

"This new information about soybean's genetic makeup could lead to plants that produce more beans that contain more protein and oil, better adapt to adverse environmental conditions or are more resistant to diseases," she said in a press release.

More than 46,000 soy genes have been identified, including key genes involved in the transformation of water, sunlight, carbon dioxide, nitrogen and minerals into energy and proteins.

One early breakthrough is the discovery of a gene that appears to confer resistance to a disease called Asian soybean rust, which can devastate up to 80 percent of a harvest.

Source: AFP



GRACIOUS NATURE

Waterfall in desert



Waterfalls at the iconic Ayers Rock, Australia

HEAVY rains which flooded parts of Australia's vast desert centre have brought rare waterfalls spilling from the iconic monolith Uluru, or Ayers Rocks.

The deluge, which swept across much of the continent's east after a tropical cyclone last month, prompted a wave of green in the Uluru-Kata Tjuta National Park, home to the giant red rock.

"It's something that a lot of people actually wouldn't experience, seeing the park at this time of year when it is green and the plants are really shooting and the flowers are coming out," said park manager Christine Burke.

"It's a very exciting time at the park now to see what happens after we have a good rain and it looks beautiful," she told state radio.

Situated near the centre of the semi-arid Sturt Desert, Uluru typically receives little more than 12 inches of rain a year, and January is its hottest, driest month, with temperatures topping to 45 degrees Celsius (113 F).

Conditions are overcast, on average, just five days of the year.

Source: AFP



IN-VITRO MEAT

Cultured meat from stem cell

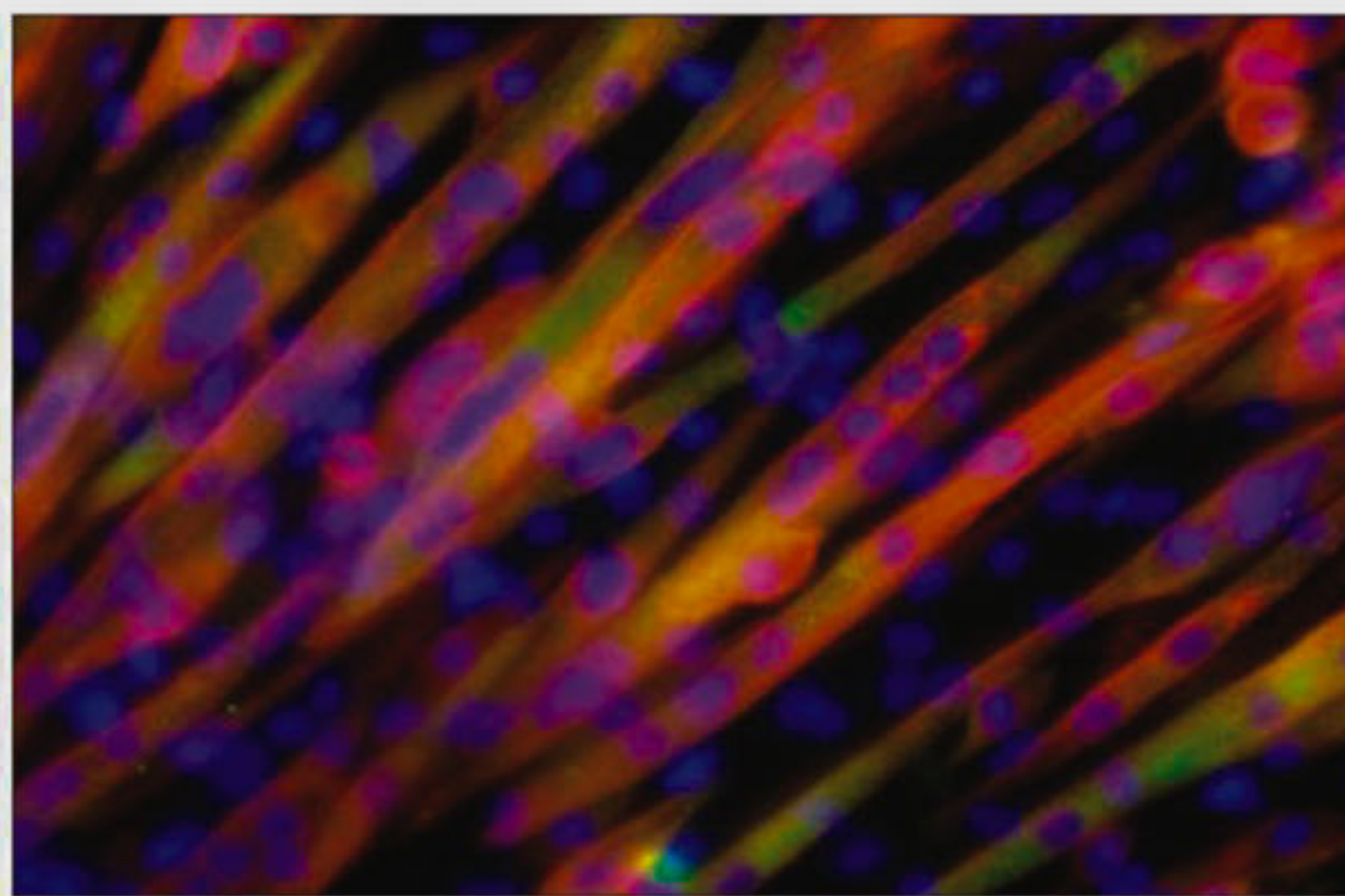
DUTCH scientists have been growing pork in the laboratory, since 2006, and while they admit they haven't gotten the texture quite right or even tasted the engineered meat, they say the technology promises to have widespread implications for our food supply.

"If we took the stem cells from one pig and multiplied it by a factor of a million, we would need one million fewer pigs to get the same amount of meat," said Mark Post, a biologist at Maastricht University involved in the In-vitro Meat Consortium, a network of publicly funded Dutch research institutions that is carrying out the experiments.

Post describes the texture of the meat as sort of like scallop, firm but a little squishy and moist. That's because the lab meat has less protein content than conventional meat.

Several other groups in the U.S., Scandinavia and Japan are also researching ways to make meat in the laboratory, but the Dutch project is the most advanced, said Jason Matheny, who has studied alternatives to conventional meat at the Johns Hopkins Bloomberg School of Public Health in Baltimore and is not involved in the Dutch research.

In the U.S., similar research was funded by NASA, which hoped astronauts would be able to grow their own meat in space. But after growing disappointingly thin sheets of tissue, NASA gave up and decided it would be better for its astronauts to simply eat



Dutch scientists grow pork in petri dish

vegetarian.

To make pork in the lab, Post and colleagues isolate stem cells from pigs' muscle cells. They then put those cells into a nutrient-based soup that helps the cells replicate to the desired number.

So far the scientists have only succeeded in creating strips of meat about 1 centimeter (a half inch) long; to make a small pork chop, Post estimates it would take about 30 days of cell replication in the lab.

There are tantalizing health possibilities in the technology.

Fish stem cells could be used to produce healthy omega 3 fatty acids, which could be mixed with the lab-

produced pork instead of the usual artery-clogging fats found in livestock meat.

"You could possibly design a hamburger that prevents heart attacks instead of causing them," Matheny said.

Post said the strips they've made so far could be used as processed meat in sausages or hamburgers. Their main problem is reproducing the protein content in regular meat: In livestock meat, protein makes up about 99 percent of the product; the lab meat is only about 80 percent protein. The rest is mostly water and nucleic acids.

Source: AP



MYTHS & FACTS

SCIENTISTS have discovered the earliest known Hebrew writing - an inscription dating from the 10th century B.C., during the period of King David's reign.

The breakthrough could mean that portions of the Bible were written centuries earlier than previously thought. (The Bible's Old Testament is thought to have been first written down in an ancient form of Hebrew.)

Until now, many scholars have held that the Hebrew Bible originated in the 6th century B.C., because Hebrew writing was thought to stretch back no further. But the newly deciphered Hebrew text is about four centuries older, scientists announced this month.

"It indicates that the Kingdom of Israel already existed in the 10th century BCE and that at least some of the biblical texts were written hundreds of years before the dates presented in current research," said Gershon Galil, a professor of Biblical Studies at the University of Haifa in Israel, who deciphered the ancient text.

BCE stands for "before common era," and is equivalent to B.C., or before Christ.

Source: AFP

Oldest Hebrew text found



3,000 year-old inscription discovered at Elah valley, Israel



SCIENCE QUIZ

Quiz 1

The first attempt at printing was made in England by...

- James Arkwright
- James Watt
- William Caxton
- Isaac Newton

Quiz 2

Numismatics is the study of...

- Coins
- Numbers
- Stamps
- Space

Ans to previous quiz

Quiz - 1
b. Albert Einstein.

Quiz - 2
b. A camera.

--Collected



MYSTERIES

Well of souls



Muslims praying at Dome of the Rock, Jerusalem

THE Well of Souls, thought to be located on the Jerusalem site known to Jews as the Temple Mount and to Muslims as the Noble Sanctuary, may contain the fabled and elusive Ark of the Covenant. This is the sacred vessel that, according to biblical account, contained the original Ten Commandments tablets that God gave to Moses at Mount Sinai as the ancient Israelites wandered the desert.

In Raiders of the Lost Ark, the intrepid Indiana Jones finds the Ark of the Covenant in a room called the Well of Souls, though in the Hollywood version the site was relocated from Jerusalem to the ancient Egyptian city of Tanis.

The Well of Souls is purportedly located below a natural cave under the rock upon which Jewish tradition says Abraham prepared to sacrifice his son Isaac. Islamic tradition indicates Muhammad ascended to heaven from this same stone.

No one knows with absolute certainty whether the Well of Souls or the Ark of the Covenant actually exists. Though knocking on the floor of the cave under the Muslim Dome of the Rock shrine elicits a resounding hollow echo, no one has ever seen this alleged chamber.

The Temple Mount itself is rife with a network of some 45 cisterns, chambers, tunnels, and caves.

Source: National Geographic