Research explores cell-based theory of consciousness and what it entails

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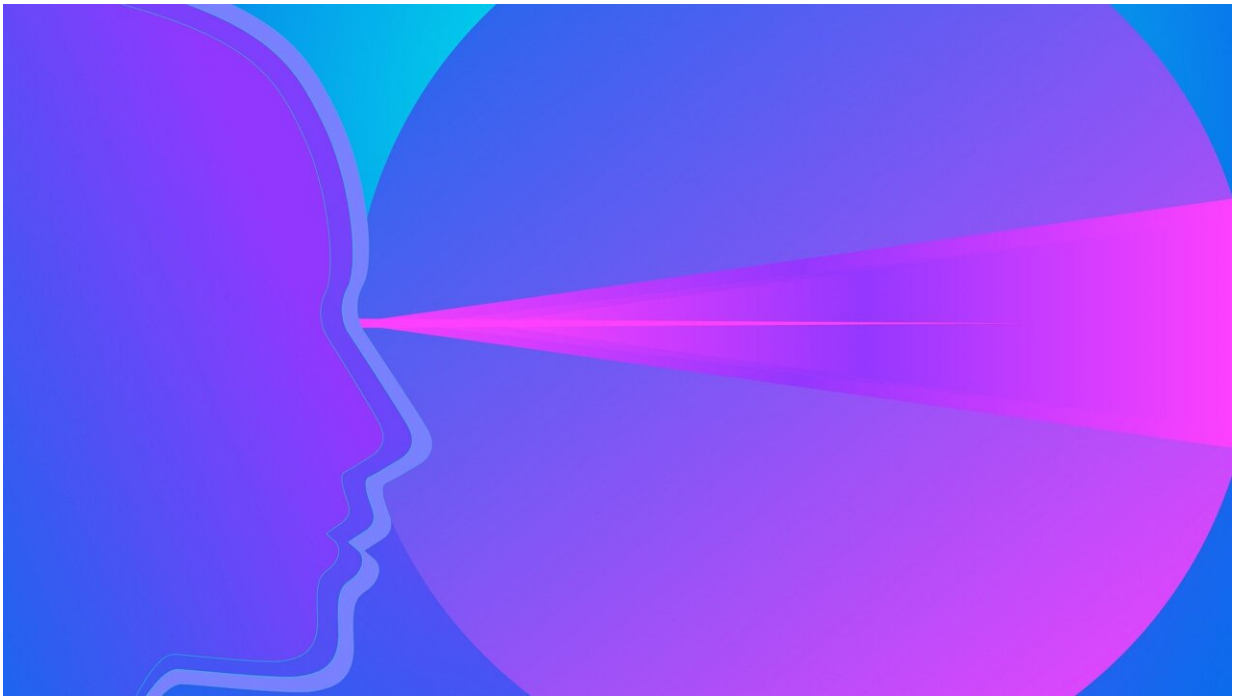

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Humans and other animals with brains perhaps aren't the only beings on the planet to experience consciousness, says a study in the journal *EMBO Reports*.

Consciousness instead underpins all life forms, from the smallest cells to the most complex organisms. Far from being limited to creatures like

ourselves, the cell-based theory of consciousness frames the phenomenon a fundamental part of life itself.

Conventional thinking about consciousness—called the standard model of consciousness—focuses on the brain, supposing only complex organisms like humans and animals have it. But the new cell-based theory argues that consciousness started with the very first cells that emerged about 3.8 billion years ago and plants, bacteria and even amoebas have it.

The standard idea of consciousness has attracted rising criticism from scientists who think it's not completely wrong, but doesn't paint the full picture.

That approach is limiting, says Brunel University London's Dr. Predrag Slijepcevic. "When you look at the entire biosphere, brains are fairly rare. That's less than 1% of the biosphere where plants make up 75% of the biomass. Bacteria make up 20%. So bacteria and plants are 95% of the biosphere. When you put all animals together, it's probably 1% or less. And humans are just one species in the animal kingdom. Our cell-based consciousness theory is that life and consciousness were simultaneous. So they're one and the same."

The team, which includes The University of British Columbia, Bioverse Foundation and University of Bonn, delves into sentience, the ability to "feel" or sense and react to the world. People call their "feeling" emotions and sensations. But even very simple single-celled organisms like amoebas show they too can "feel" by reacting to the environment.

When they feel something is wrong in the environment, some amoebas build a protective calcium carbonate shell or house around themselves. The iconic White Cliffs of Dover show just that—they're made of trillions of shells made by living things. When amoebas die, their shells

calcify, and over about 100 million years, amoeba shells piled up to form the symbolic landmark.

This is how the cell-based consciousness theory intertwines consciousness with evolution. It started with bacteria and the very first forms of life, which over billions of years evolved into more complex life forms.

The implications of this theory, based on two dozen research papers published in the last four years, stretch way beyond consciousness. The cell-based theory could potentially reframe how we view life, intelligence, and even artificial intelligence, challenging what we already think about existence.

"Obviously, there are people who would disagree," said Dr. Slijepcevic, "that's the nature of science. But we think people should focus on cell-based consciousness. Whether that will be accepted by the mainstream, we don't know, but we say cell-base consciousness has the capacity to perhaps provide a new, more useful understanding of consciousness. It basically boils down to interpreting what life is what life is all about. Life is about consciousness. We look forward to a paradigm shift in evolutionary biology."

More information: Arthur S. Reber et al, The CBC theory and its entailments: Why current models of the origin of consciousness fail, *EMBO Reports* (2023). DOI: 10.1038/s44319-023-00004-6. www.embopress.org/doi/full/10. … 8/s44319-023-00004-6

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