Protocells formed in salt solution, researchers find

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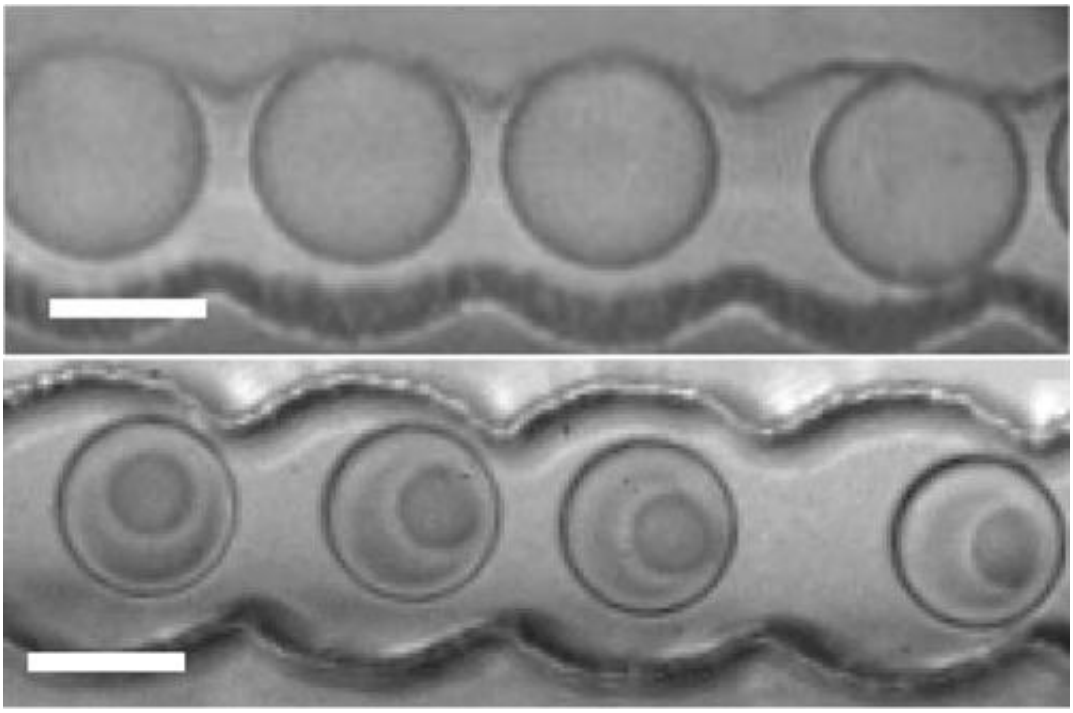

Protocells form spontaneously around biomolecules. Credit: Proceedings of the National Academy of Sciences USA

The first cell may have originated in a salty soup in which large biomolecules cluster spontaneously to form a protocell, chemists at Radboud University Nijmegen discovered. *PNAS* published their work on July 1.

How did the first cell originate in evolution? It is a chicken or the egg

causality dilemma: a cell doesn't function without a cell wall, but how does the cell wall form if there is no cell? Research by chemist Wilhelm Huck, professor at Radboud University Nijmegen, suggests that the cell came first.

In a solution containing the biomolecules that are normally locked in a cell (like DNA, RNA, enzymes, proteins) these large biomolecules clustered together spontaneously when the salt concentration was increased. This indicates that a cell wall is not a prerequisite for a cell-like structure.

Huck thinks the macro molecules in our cells evolved to do their work while packed closely together. By using tiny droplets, he explores how this works exactly. "When biomolecules are packed together, we expect reactions to proceed much faster. They perform their chemistry much more efficiently. In this study, we measure a fifty-fold increase in the DNA transcription rate."

A working cell is more than the sum of its parts. "A functioning cell must be entirely correct at once, in all its complexity," said Huck. "We are now closer to building a synthetic cell than anyone ever before us."

The paper is titled "Enhanced transcription rates in membrane-free protocells formed by coacervation or cell lysate."

More information: Sokolova et al. Enhanced transcription rates in membrane-free protocells formed by coacervation or cell lysate, 2013. *PNAS* www.pnas.org/cgi/doi/10.1073/pnas.1222321110

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