

New insights into the origin of life on Earth

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In an advance toward understanding the origin of life on Earth, scientists have shown that parts of the Krebs cycle can run in reverse, producing biomolecules that could jump-start life with only sunlight and a mineral present in the primordial oceans.

The Krebs cycle is a series of chemical reactions of central importance in cells — part of a metabolic pathway that changes carbohydrates, fats and proteins into carbon dioxide and water to generate energy.

Scot T. Martin and Xiang V. Zhang explain that a reverse version of the cycle, which makes enzymes and other biomolecules from carbon dioxide, has been getting attention from scientists studying the origin of life. If the reverse cycle worked on a lifeless Earth, it could have produced the fundamental biochemicals needed for the development of more-advanced biological systems like RNA that could reproduce themselves.

In a report scheduled for the Dec. 13 issue of the weekly *Journal of the American Chemical Society*, Martin and Zhang demonstrate that three of the five chemical reactions in the reverse Krebs cycle worked and produced biomolecules on the surface of a mineral believed to have been present in the waters of the early Earth. The mineral -- sphalerite -- acted as a photocatalyst that worked with sunlight to foster the chemical reactions.

Source: American Chemical Society

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