'Chemical gardens' could hold the key to understanding the origins of life on Earth

EurekAlert!

The "chemical garden," a school classroom chemistry experiment, in which beautiful plant-like structures sprout in a test tube, has become the linchpin for real-world scientific experiments that aim to shed light on the origins of life on Earth. Those Gardens of Eden and a "battery" that could have kick-started life are the topic of a story in the current edition of *Chemical & Engineering News*. C&EN is the weekly newsmagazine of the American Chemical Society, the world's largest scientific society.

Carmen Drahl, C&EN senior editor, explains that chemical gardens are experiments with roots dating to 1646 in which metal salt crystals, such as iron chloride, make contact with water glass — a syrupy solution of sodium silicate — or other solutions. The result is the growth of plant-like structures within minutes to hours. Chemical gardens aren't alive, but they have become an inspiration for origin-of-life research at hydrothermal vents. Mineral-rich fluid from deep within Earth's surface pours out of these submarine springs and solidifies into formations, often several stories high, with similarities to chemical gardens.

Some scientists regard hydrothermal vents as places where life may first have originated on Earth, the article points out. It explains why the vents and their chimney-like counterparts to classroom chemical gardens may have been ideal for life's origins. One research project involves establishing that electric currents can flow from substances inside the flower-like structures in a chemical garden to the outside. If so, chemical gardens could become the equivalent of the "battery" that might have jump-started life billions of years ago.

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