

# Evolutionary Thinking on the Chemical Level



David Baum  
Professor, Botany and Genetics

## CURRENT RESEARCH

### A strategy for evolving new life-like chemical processes

"Where did we come from, and where are we going?" is a question that has haunted humanity for centuries, if not millennia. While many of us have come to understand life specifically in biological terms, a chemistry perspective may transform our current understanding. How important is the specific chemistry to the emergence of life-likeness, and how predictable is life's evolution; is life-likeness unique to earth or widespread in the universe? Dr. David Baum, Professor of Botany and Genetics at the University of Wisconsin-Madison, uses chemical evolution experiments to address these profound questions. Life-like chemical systems are self-sustaining systems of chemical reactions that have the potential to evolve through selection towards greater complexity. New theories suggest that life-likeness may arise more easily than we had originally thought, motivating Dr. Baum to develop a creative approach to generating life-like chemical systems in the lab. Ultimately, Dr. Baum intends to understand the first steps in the origin of life - the emergence of evolvable chemical systems.

Understanding how life arises requires studying how life-like chemical systems arise in the first place. While cellular life manifests life-like chemistry, there are good reasons to suppose that life-like chemistry begins at a much simpler level of organization than a cell. Therefore, many scientists now think that a system with a replenishing supply of energy and abundant chemical building blocks would inevitably yield life-like chemical systems. The greatest challenge is detecting such systems when they are so much simpler than cellular life.

Dr. Baum and his collaborators have developed a novel approach to detecting the...

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## AFFILIATION

 University of Wisconsin-Madison

## EDUCATION

- Ph.D. in Evolutionary and Population Biology 1991, Washington University in St. Louis
- B.A. in Botany 1985, Oxford University

## AWARDS

- Fellow of the American Association for the Advancement of Science
- Chancellor's Distinguished Teaching Award, UW-Madison, 2015
- Fellow of the University of Wisconsin Teaching Academy, 2010
- Letters and Sciences Hamel Family Faculty Fellowship, UW-Madison, 2009-2014
- Christiansen Fellowship, St. Catherine's College, Oxford, 2008
- and 1 more...

## RESEARCH AREAS

Environment, Chemical, Evolution, Chemistry

## FUNDING REQUEST

Your contributions will support Dr. David Baum of University of Wisconsin-Madison and his team as they continue to experiment on life-like chemical systems. Funds will help build an interdisciplinary team of researchers and will fund research that will bring us closer to discovering the origin of life-like systems on earth and beyond.