

Evaluating Models of the Origin of Life

Currently, most scientists deny the reality of life's creation as revealed in the Bible. Instead it is proposed that the first forms of life originated by means of unguided chemical processes. However, in view of the breathtaking intricacy and sophistication of even the mostly primitive organisms, no one has a clue how exactly the first organisms might have been formed. From the mid of the 20th century until now several scientists have conducted experiments to underpin models that have been put forth to explain the miracle of the origin of life. In spite of repeated assertions to have come close to the solution, the actual data reveal a different picture. Some of the most important models of the origin of life and related experiments will be analyzed with respect to their plausibility.

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I. How I Came Towards the "Origin of Life"- Topic

- A. Experience in laboratory – first doubts about evolution

- B. Experience in debates – a charged issue

II. The Challenge: The Complexity and Perfection of Life

- A. The perfection of life's building blocks
 - 1. Amino acids

 - 2. Nucleotides

- B. Biopolymers – unstable macromolecules with ingenious functions
 - 1. Nucleic acids

 - 2. Proteins

 - 3. Replication

C. Origin of the first organism?

1. LUCA – a hypothetical minimal organism
2. Some surprising facts about anaerobes

III. Current Models for the Origin of Life

A. Concepts and questions

1. RNA-World
2. Metabolism-first
3. Origin of LUCA

B. Experiments and problems

1. Formation of building blocks of life
2. Formation and replication of polymers
3. Formation and propagation of protocells

IV. Conclusion

A. Origin of life just happened? Some comments:

B. Summary

Suggested Readings:

1. Damer, D. Deamer, The Hot Spring Hypothesis for an Origin of Life, *Astrobiology* 2020, 20, doi: 10.1089/ast.2019.2045.
2. G. F. Joyce, J. W. Szostak, Protocells and RNA Self-Replication, *Cold Spring Harb Perspect Biol* 2018; 10: a034801.
3. L. E. Orgel, The Implausibility of Metabolic Cycles on the prebiotic Earth, *PLoS Biology* 2008, 6: e18.
4. S. A. Benner, H.-J. Kim, M. A. Carrigan, Asphalt, Water, and the Prebiotic Synthesis of Ribose, Ribonucleotides, and RNA, *Acc. Chem. Res.* 2013, 45: 2025-2034.