The Origins of Life

From Abiotic Chemistry to the First Cells

Karl J. Niklas, Thomas G. Owens, and Randy Wayne

The Origins of Life: From Abiotic Chemistry to the First Cells is an essential textbook that tackles one of the greatest mysteries in science—how inanimate matter evolved into the first living things. The book takes an interdisciplinary approach, delving into the basic principles of Earth's chemistry, the formation of precellular entities, and the evolution of chemical complexity. It attempts to explain the origins of chromosomes, metabolic pathways, and the features of the earliest prokaryotes. Users will find a detailed exposition of the RNA World Hypothesis in an accessible and easy-to-read style.

This textbook is a critical resource for upper-level undergraduate students in cellular biology, specifically those studying or researching evolution, cellular chemistry, and prebiotic chemistry, as well as majors in courses on the philosophy of science or related topics. It is also useful for professionals in biochemistry, evolutionary biology, and astrobiology who wish to understand the origins of life and the first cells. Science communicators could use this interdisciplinary textbook for teaching and dissemination to broader audiences as well.

- Functions as a readable and instructive book on the evolution of life
- Offers a deep dive into the first principles of the physical sciences
- Explores, in detail, the emergence of life from inanimate matter

Karl J. Niklas is an emeritus professor at Cornell University. He is the author of five other books and has taught classes in introductory biology, introductory botany, evolution, and biomechanics. His research has focused on the application of engineering principles and physics to understand biology and evolution.

Thomas G. Owens is an emeritus professor at Cornell University. Over the course of his career, he taught classes that spanned the range from introductory biology through the physiology, biochemistry, and biophysics of plant processes. His research encompassed the physiology and molecular biophysics of photosynthesis.

Randy Wayne is an associate professor at Cornell University. He is the author of Plant Cell Biology: From Astronomy to Zoology, which is in its second edition, and Light and Video Microscopy, which is in its third edition. Besides teaching advanced classes in these two subjects, he teaches a class called Light and Life for nonscience majors. He does research on the nature of light.

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