

# EVOLUTION SINCE CODING

## Cradles, Halos, Barrels, and Wings

*Evolution since Coding: Cradles, Halos, Barrels, and Wings* describes genesis of metabolism, transcription, translation, cell structure, eukaryotic complexity, LUCA (the last universal common (cellular) ancestor), the great divergence of archaea and bacteria, LECA (the last eukaryotic common ancestor), extinction, and cancer in very simple ways. The work (almost) "synthesizes life from scratch" (since coding) and describes the tools for readers to check the author's work. As a result, readers understand living systems and their evolution in a conceptual way and are empowered to utilize powerful but accessible tools in computer-based biology.

The work serves as foundational reading for a variety of researchers, academics, and students in life sciences, for example, in evolution/evolutionary biology, biochemistry, genetics/molecular genetics, molecular biology, cell biology, and microbiology, as well as disciplines beyond biological science. Its approachable style makes the book accessible for introductory students and educated laypersons. *Evolution since Coding* is suitable to supplement college courses that mix computers, evolution, and biology from freshman to senior level.

### Key Features

- Provides a simple, hands-on route to understand the ancient evolution and diversification of life on earth
- Offers a conceptual understanding of biology, evolution, protein structure, RNA synthesis, protein synthesis, signaling, genesis of the three domains, and cell structures
- Approaches ancient evolution via code-breaking protein and RNA sequences and motifs

**Cover Art:** A detail of the human preinitiation complex showing the catalytic core of RNA polymerase II. The two double- $\Psi$ - $\beta$ -barrels are shown. The bridge helix is yellow. The trigger loop is green. Mg ions at the active site are green spheres. The image was generated from PDB 5IY7 using Chimera (UCSF). Used with permission. He, Y., Yan, C., Fang, J., Inouye, C., Tjian, R., Ivanov, I. & Nogales, E., 2016. Near-atomic resolution visualization of human transcription promoter opening. *Nature*, 533, 359-65.



ACADEMIC PRESS

An imprint of Elsevier  
[elsevier.com/books-and-journals](http://elsevier.com/books-and-journals)

ISBN 978-0-12-813033-9



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