

Contents

Part I Concept and Knowledge

- 1 **Spontaneous Generation Revisited at the Molecular Level** 3
Fabiana Ciciriello, Giovanna Costanzo, Samanta Pino,
and Ernesto Di Mauro
- 2 **Minimal Cell Model to Understand Origin of Life and Evolution** 23
Tadashi Sugawara
- 3 **New Fossils and New Hope for the Origin of Angiosperms** 51
Xin Wang
- 4 **Vertebrate Evolution: The Strange Case
of Gymnophionan Amphibians** 71
Jean-Marie Exbrayat and Michel Raquet
- 5 **The Evolution of Morphogenetic Signalling in Social Amoebae** 91
Yoshinori Kawabe and Elisa Alvarez-Curto Allyson V. Ritchie,
and Pauline Schaap
- 6 **On the Surprising Weakness of Pancreatic Beta-Cell Antioxidant
Defences: An Evolutionary Perspective** 109
Armin Rashidi, Thomas B.L. Kirkwood, and Daryl P. Shanley
- 7 **The Importance of Transpositions and Recombination to Genome
Instability According *hobo*-Element Distribution Pattern in
Completely Sequence Genome of *Drosophila melanogaster*** 127
L.P. Zakharenko, M.P. Perepelkina, and D.A. Afonnikov

8 Long-Term Evolution of Histone Families: Old Notions and New Insights into Their Mechanisms of Diversification Across Eukaryotes	139
José M. Eirín-López, Rodrigo González-Romero, Deanna Dryhurst, Josefina Méndez, and Juan Ausió	
9 Masculinization Events and Doubly Uniparental Inheritance of Mitochondrial DNA: A Model for Understanding the Evolutionary Dynamics of Gender-Associated mtDNA in Mussels	163
Donald T. Stewart, Sophie Breton, Pierre U. Blier, and Walter R. Hoeh	
10 Missing the Subcellular Target: A Mechanism of Eukaryotic Gene Evolution	175
S.A. Byun McKay, R. Geeta, R. Duggan, B. Carroll, and S.J. McKay	
11 The Evolution of Functional Gene Clusters in Eukaryote Genomes	185
Takashi Makino and Aoife McLysaght	
12 Knowledge Standardization in Evolutionary Biology: The Comparative Data Analysis Ontology	195
Francisco Prosdocimi, Brandon Chisham, Enrico Pontelli, Arlin Stoltzfus, and Julie D. Thompson	
Part II Modeling	
13 Large-Scale Analyses of Positive Selection Using Codon Models	217
Romain A. Studer and Marc Robinson-Rechavi	
14 Molecular Coevolution and the Three-Dimensionality of Natural Selection	237
Mario A. Fares and Christina Toft	
15 The Evolutionary Constraints in Mutational Replacements	253
Branko Borštnik, Borut Oblak, and Danilo Pumpernik	
16 Why Phylogenetic Trees are Often Quite Robust Against Lateral Transfers	269
Marc Thuillard	
Part III Applied Evolutionary Biology	
17 The Genome Sequence of <i>Meloidogyne incognita</i> Unveils Mechanisms of Adaptation to Plant-Parasitism in Metazoa	287
Etienne G.J. Danchin and Laetitia Perfus-Barbeoch	

**18 Ecological Genomics of Nematode Community Interactions:
Model and Non-model Approaches 303**
Michael A. Herman, Joseph D. Coolon, Kenneth L. Jones,
and Timothy Todd

19 Comparative Evolutionary Histories of Fungal Chitinases 323
Magnus Karlsson and Jan Stenlid

20 Aging: Evolutionary Theory Meets Genomic Approaches 339
George L. Sutphin and Brian K. Kennedy

Part IV Applications in Other Field

21 Galaxies and Cladistics 363
Didier Fraix-Burnet

**22 Economics Pursuing the Mold of Evolutionary Biology:
“Accident” and “Necessity” in the Quest to make
Economics Scientific 379**
Michael H. Turk

Index 393