Molecular Phylogeny of Microorganisms

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A proper understanding of the diversity, systematics and nomenclature of microbes is increasingly important in many branches of biological science. The molecular approach to phylogenetic analysis, pioneered by Carl Woese in the 1970s and leading to the three-domain model (Archaea, Bacteria, Eucarya), has revolutionized our thinking about evolution in the microbial world. The technological innovation of modern molecular biology and the rapid advancement in computational science have led to a flood of nucleic acid sequence information, bioinformatic tools and phylogenetic inference methods. Phylogenetic analysis has long played a central role in microbiology and the emerging fields of comparative genomics and phylogenomics require substantial knowledge and understanding of phylogenetic analysis and computational methods.

In this book, leading scientists from around the world explore current concepts in molecular phylogeny and their application with respect to microorganisms. The authors describe the different approaches applied today to elucidate the molecular phylogeny of prokaryotes (and eukaryotic protists) and review current phylogenetic methods, techniques and software tools. Topics covered include: a historical overview, computational tools, multilocus sequence analysis, 16S rRNA phylogenetic trees, rooting of the universal tree of life, applications of conserved indels, lateral gene transfer, endosymbiosis and the evolution of plastids.

This book is an ideal introduction to molecular phylogeny for all microbiologists and is an essential review of current concepts for experts in the field. A recommended text for all microbiology laboratories.

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