



The Cyanobacteria: Molecular Biology, Genomics and Evolution

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Cyanobacteria are a fascinating and versatile group of bacteria of immense biological importance. Thought to be amongst the first organisms to colonize the earth, these bacteria are the photosynthetic ancestors of chloroplasts in eukaryotes, such as plants and algae. In addition, they can fix nitrogen, survive in very hostile environments (e.g. down to -60-degreesC), are symbiotic, have circadian rhythms, exhibit gliding mobility, and can differentiate into specialized cell types called heterocysts. This makes them ideal model systems for studying fundamental processes, such as nitrogen fixation and photosynthesis. In addition, cyanobacteria produce an array of bioactive compounds, some of which could become novel anti-microbial agents, anti-cancer drugs, UV protectants, etc. The amazing versatility of cyanobacteria has attracted huge scientific interest in recent years. Given that 24 genomes sequences have been completed and many more projects are currently underway, the point has been reached where there is an urgent need to summarize and review the current molecular biology, genomics, and evolution of these important organisms. This volume brings together the expertise and enthusiasm of an international panel of leading cyanobacterial researchers to provide a state-of-the art overview of the field. Topics covered include: evolution, comparative genomics, gene transfer, molecular ecology and environmental genomics, stress responses, bioactive compounds, circadian clock, structure of the photosynthetic apparatus, membrane systems, carbon acquisition, nitrogen assimilation, C/N balance sensing, and much more. This book will be essential for anyone with an interest in cyanobacteria, bacterial photosynthesis, bacterial nitrogen fixation, and symbiosis.

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