

Aspergillus and *Penicillium* in the Post-genomic Era

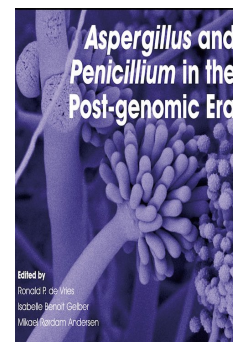
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Genome sequencing has affected studies into the biology of all classes of organisms and this is certainly true for filamentous fungi. The level with which biological systems can be studied since the availability of genomes and post-genomic technologies is beyond what most people could have imagined previously. The fungal genera *Aspergillus* and *Penicillium* contain some species that are amongst the most widely used industrial microorganisms and others that are serious pathogens of plants, animals and humans. These genera are also at the forefront of fungal genomics with many genome sequences available and a whole genus genome sequencing project in progress for *Aspergillus*.

This book highlights some of the changes in the studies into these fungi, since the availability of genome sequences. The contributions vary from insights in the taxonomy of these genera, use of genomics for forward genetics and genomic adaptations, to specific stories addressing virulence, carbon starvation, sulphur metabolism, feruloyl esterases, secondary metabolism and pH modulation, to the development of novel methodology for use in parallel to genome sequencing. It therefore provides a taste of the current status of research in *Penicillium* and *Aspergillus* and a promise of many more things to come.

An essential reference for everyone working with *Aspergillus* and *Penicillium* and other filamentous fungi and the book is also recommended reading for everyone with an interest in fungal genomics.

Chapter 1. Taxonomy of *Aspergillus*, *Penicillium* and *Talaromyces* and its Significance for Biotechnology (Jos Houbraken, Robert A. Samson and Neriman Yilmaz)

Chapter 2. Comparative Genomics, Resequencing and Fast Forward Genetics in *Aspergillus* and *Penicillium* (Scott E. Baker and Erin L. Bredeweg)

Chapter 3. Diversity and Mechanisms of Genomic Adaptation in *Penicillium* (Jeanne Ropars, Ricardo C. Rodríguez de la Vega, Manuela López-Villavicencio, Jérôme Gouzy, Joëlle Dupont, Dominique Swennen, Emilie Dumas, Tatiana Giraud and Antoine Branca)

Chapter 4. Approaches for Comparative Genomics in *Aspergillus* and *Penicillium* (Jane L. Nybo, Sebastian Theobald, Julian Brandl, Tammi C. Vesth and Mikael R. Andersen)

Chapter 5. Blue Mold to Genomics and Beyond: Insights into the Biology and Virulence of Phytopathogenic *Penicillium* Species (Wayne M. Jurick II, Jiujiang Yu and Joan W. Bennett)

Chapter 6. Post-genomic Approaches to Dissect Carbon Starvation Responses in *Aspergilli* (Jolanda M. van Munster, Anne-Marie Burggraaf, Istvan Pocsj, Melinda Szilágyi, Tamas Emri and Arthur F.J. Ram)

Chapter 7. Genetics and Physiology of Sulfur Metabolism in *Aspergillus* (Andrzej Paszewski, Jerzy Brzywczy, Marzena Sienko and Sebastian Pilsyk)

Chapter 8. Production of Feruloyl Esterases by *Aspergillus* Species (Miia R. Mäkelä, Luis Alexis Jiménez Barboza, Ronald P. de Vries and Kristiina S. Hildén)

Chapter 9. Secondary Metabolite Formation by the Filamentous Fungus *Penicillium chrysogenum* in the Post-genomic Era (Marta M. Samol, Oleksandr Salo, Peter Lankhorst, Roel A.L. Bovenberg and Arnold J.M. Driessen)

Chapter 10. The pH Modulation by Fungal Secreted pH Effecting Molecules: A Mechanism Affecting Pathogenicity and Mycotoxin Accumulation During Colonization by *Penicillium expansum* (Dov Prusky, Shiri Barad, Nofar Glam, Nancy Keller and Amir Sherman)

Chapter 11. Evolutionary Adaptation as a Tool to Generate Targeted Mutant Strains as Evidence by Increased Inulinase Production in *Aspergillus oryzae* (Helena Culleton, Eline Majoor, Vincent A. McKie and Ronald P. de Vries)

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