

Book review

Molecular plant pathology. Annual Plant Reviews, Volume 4. Edited by M. Dickinson and J. Beynon. 1999. 306 pp. Sheffield Academic Press, Sheffield, United Kingdom. \$85.00. ISBN 1-84127-108-X.

This book comprises 10 chapters which cover the latest developments in three key areas of molecular plant pathology. These are; how pathogens incite disease, the mechanisms that determine resistance to infection and how emerging technologies can be used to engineer disease resistant plants and to understand host pathogen interactions.

The first three chapters deal with how fungi, bacteria and viruses become established in host tissue. The opening chapter (Balhadere and Talbot) is essentially a case study using the rice blast fungus *Magnaporthe grisea* to illustrate the complexity of signalling pathways and biological processes contributing to the infection process. Chapter 2 (Huguet) concentrates on recent developments in our understanding of bacterial pathogenicity. The discovery of a type III secretion system in symbiotic bacteria and the implications of this for understanding the molecular basis of bacterial pathogenesis is discussed in detail. The final chapter in this area (Nettlehip and Foster) is concerned with viral pathogenicity and provides a clear account of how viral proteins may have multiple interactions with components of the host plant. The next five chapters deal with disease resistance and taken together they provide a comprehensive description of the subject. Chapter 4 (Dodds, Lawrence, Pryor and Ellis) describes recent developments in the genetics of disease resistance genes and in processes involved in their evolution. This is followed by a chapter (Jones) which is, essentially, a detailed in-depth review of resistance genes and the biochemical function of resistance gene products as deduced from sequence and motif similarities. Plant defence signalling during disease resistance is the topic covered in the next chapter

by Parker and considers various cellular processes such as ion fluxes, reactive oxygen species and small signal molecules in relation to R-gene mediated resistance. The subject of programmed cell death or apoptosis is tackled in detail in Chapter 7 (Birch, Avrova, Dellagi, Lacomme, Santa Cruz and Lyon) and the key question addressed here is how this cellular process relates to pathogen-induced hypersensitive cell death and resistance. Pathways leading to systemic acquired resistance (SAR) are reviewed in the chapter by Barker which focuses on the role of salicylic acid and other signalling pathways in the induction of pathogenesis-related proteins. It also includes a discussion on the use of mutants to study SAR. The penultimate chapter (Walsh) deals with the development of various new and novel forms of resistance against viruses which have come about following the advent of plant transformation technology. This account of transgenic-derived resistance against viruses includes the use of viral proteins, DNA or RNA, RNA interference and plant resistance genes. The last chapter by Dietrich discusses new genetic- and genomics-based approaches to understanding host-pathogen interactions. This includes insertional mutagenesis, map-based cloning and RNA interference on the genetics side and transcriptome analysis, proteomics, and metabolic profiling for the post-genomic approaches.

This book is well composed and provides an up-to-date view of the subject areas covered. It is a valuable contribution to the literature, particularly on the resistance of plants to disease, and it should be useful to plant pathologists with an interest in pathogenicity, disease resistance and signalling.

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