

BOOK REVIEWS

Expl Agric. (2013), volume 49 (2), © Cambridge University Press 2012

doi:10.1017/S0014479712001093

Genomics and Bioinformatics. An Introduction to Programming Tools for Life Scientists. By T. Samuelsson. Cambridge, UK: Cambridge University Press (2012), pp. 338, £29.99. ISBN 9781107401242.

This book is subtitled as *An Introduction to Programming Tools for Life Scientists* and this describes well its intent and content. It assumes background knowledge of basic principles in molecular biology and cell biology and access to a computer running a Unix operating system with Perl installed.

The first three substantive chapters deal with some of the basic tools of molecular biology: restriction enzymes, RNAi and PCR. A distinctive feature of the book is the way in which discussion of these concepts is interspersed with practical examples of the use of Perl in addressing relevant problems. Three chapters look at different aspects of human disease while introducing bioinformatic techniques such as BLAST analysis. Examples from evolutionary studies are used to introduce sequencing alignments, molecular phylogeny and bootstrapping. Subsequently, gene function is approached from a consideration of metagenomics and protein domains. An important chapter deals with information resources, including those of the National Centre for Biotechnology Information and European Bioinformatics Institute. Subsequent chapters describe finding genes, with a strong focus on the ‘RNA world’ and finally ‘personal genomes’, single nucleotide polymorphisms and the study of human variation.

Each chapter ends with a small number of exercises and there are four very useful appendices on UNIX, sequence analysis software, Perl and an introduction to R.

The author’s stated aim is to convince us that relatively simple programming skills can be used to tackle many common biological problems. He succeeds in this, and both the detail of the book and the attitude it conveys are to be welcomed.

Michael Abberton

Expl Agric. (2013), volume 49 (2), © Cambridge University Press 2013

doi:10.1017/S0014479712001354

Plant Breeding for Biotic Stress Resistance. Edited by R. Fritsche-Neto and A. Borém. Heidelberg: Springer (2012), pp. 173, £126.00. ISBN 978-3642330865.

Biotic stresses severely reduce the yield of food crops worldwide. In the last few decades, breakthroughs in biotechnology and molecular biology have provided new tools in the form of marker assisted selection and genetic engineering. These new technological advances coupled with conventional plant breeding procedures have opened new avenues for developing crops with resistance to various biotic stresses. Editors of *Plant Breeding for Biotic Stress Resistance* have done an admirable job of assembling a wealth of information to breed crops with improved resistance to biotic stresses. The book is divided into eight chapters each highlighting a specific biotic stress. The introductory chapter provides lucid information regarding overall challenges associated with breeding cultivars for biotic resistance. The most important drivers of biotic stress, i.e. fungi, bacteria, viruses, nematodes and insects/pests are discussed in chapters two to six, respectively along with various breeding strategies to minimize their effect and identify the sources of resistance/germplasm with reference to a specific crop. Chapter seven focuses on the mechanisms of plant resistance to the insect pests of stored grains that cause huge pre- and post-harvest losses. The authors depict that practical knowledge regarding types and severity of store grain insect pests is direly needed to establish breeding programs to mitigate losses. The relative importance of weed management via crop breeding is discussed in the last chapter to determine the theoretical and physiological basis of stress induced by competition between crop plants and weeds. Various strategies are