

Book Review

Toxoplasma. Molecular and Cellular Biology. (ed. Ajioka, J. W. and Soldati, D.) pp. 626. Horizon Bioscience, Wymondham, Norfolk, UK, 2007. ISBN 978-1-904933-34-2. £150 (US\$300) doi:10.1017/S0031182008004861
First published online 6 August 2008

Toxoplasma gondii is a well-characterized obligate intracellular apicomplexan parasite that is found ubiquitously in nature and is of both medical and veterinary importance. The study of this parasite and its relationship with the host has provided researchers with significant knowledge of apicomplexan cell biology and host-intracellular pathogen relationships in general. The remarkable knowledge of this complex eukaryotic microorganism, that has been acquired over the years, has allowed it to be used in research as a model organism to understand a number of biological issues, including immunoregulatory mechanisms in mammalian hosts, modification of the host environment, organelle evolution and biogenesis.

The timely publication of this book, approximately 100 years since the discovery and initial description of the parasite by the pioneering scientists Nicholle, Manceaux and Splendore, represents a comprehensive detailed account of the parasite from an experienced and enthusiastic community of investigators.

The book is divided into 6 thematic parts preceded by an elegant preface from the editors that illustrates the historical path of the classification of *T. gondii*, from its discovery in the beginning of the 20th century; its identification as a coccidian parasite and its association with the definitive host, the cat in the 1960s and 1970s by Frenkel, Jacobs and Hutchison. The preface contains original excerpts from the initial observations of Nicholle and Manceaux, which provides a sample of the difficult to obtain original source material from the beginning of the last century.

The first theme reviews the life cycle and ultra-structure of the parasite by venerable authors who have a considerable amount of experience as they have performed the pioneering work themselves. The second theme is extensive and contains a comprehensive selection of chapters that concern

epidemiology, disease pathogenesis of ocular and congenital toxoplasmosis. In addition, work that clarifies the parasite-host interaction, including immunity to *Toxoplasma*, mechanisms of immune evasion, virulence genes and their effect on pathogenesis is described. This topic is further elaborated in Part 3, which provides a detailed analysis of the three archetypal lineages of *Toxoplasma* and the evolution of the *Apicomplexa*, including endosymbiotic events and horizontal gene transfers. Due to its haploid nature and rapid proliferation, *Toxoplasma* presents an ideal model apicomplexan for molecular and genetic studies such as transfection, RNA silencing, the generation of transgenic and mutant *Toxoplasma* parasites that have been used to understand apicomplexan metabolism and motility. Parts 4 and 5 of the book cover the cell biology of *Toxoplasma* from parasite growth, development and stage interconversion to details of metabolism, organellar biology (including a detailed description of the secretory organelles, rhoptries, micronemes and dense granules). The importance of the parasitophorous vacuole membrane as an interface between the parasite and its host is highlighted in the conclusive section of this book, as are chapters that focus on the cytoskeleton and motility, signalling and the host cell invasion process.

All chapters are outstanding and well-referenced reviews of the many different aspects of *Toxoplasma* or the disease it causes. The authors and the editors are to be congratulated for their work. Notably, many chapters include comprehensive tables and diagrams, which are easy to follow and provide excellent summaries of each topic covered. The editors have elegantly put the chapters together into the 6 themes resulting in the production of a piece of essential reading for all those working with apicomplexan parasites.

FIONA L. HENRIQUEZ

School of Engineering and Science
University of the West of Scotland
1 High Street
Paisley
Renfrewshire
Scotland