Book Review

Ascaris: *The Neglected Parasite*. By Celia Holland, editor, p. 425. Academic Press, 2013. ISBN: 978-0-12-396978-1

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The parasitic nematode *Ascaris* is the most prevalent of soil transmitted helminths, with 0·8–1·2 billion people estimated to be infected. While infections are rarely life-threatening, heavy worm burdens and the chronicity of infection have a debilitating effect on growth, performance and cognitive development. In addition, *Ascaris* occurs in regions of the world where co-infection with malaria and HIV-1 are common, and the interactions in endemic populations are beginning to be examined.

The reasons why *Ascaris* is a neglected parasite are highlighted in the introductory section and include difficulties of monitoring and controlling infection in regions where poverty is common, as well as the lack of a suitable rodent model system. The significant progress made in the last 20 years is brought together in this book. Congratulations to the editor Celia Holland and all the contributors for this comprehensive and up-to-date overview.

The book has 16 chapters organized into 5 themes: the biology of *Ascaris*, model systems, epidemiology, host and parasite genetics, and clinical aspects and public health. Although focused on *Ascaris*, the approaches and principles are highly relevant to related helminth infections of humans and animals. The book will be a standard reference for helminth parasitologists, suitable for undergraduate and postgraduate students as well as those studying parasite genetics, immunology, epidemiology and control in a clinical, veterinary or biology setting. All chapters are accessible to the non-specialist and a comprehensive reference list at the end of each provides an excellent resource for the more specialist reader.

The first section begins with a good overview (P. J. Cooper and C. A. Figuieredo) on *Ascaris* immunology and immunomodulation. The Th2-type response is described in both humans to *Ascaris lumbricoides* and in pigs to *Ascaris suum*. The immunosuppressive and anti-inflammatory potential of *Ascaris* molecules is contrasted with the acute IgE and allergic responses observed in some individuals (Chapter 2, L. Caraballo). Heterogeneity in host recognition, as well as polymorphism of parasite antigens, is described in Chapter 3 (M. W. Kennedy). The polymorphic nature of many helminths, not only *Ascaris*, may be important in maintaining infection as immunity develops. The effects of immune responses to *Ascaris* on co-infection, specifically HIV-1 and malaria, are reviewed in Chapter 4 (F. Abanyie and T. J. Lamb).

The model systems theme begins in Chapter 5 (C. V. Holland, J. M. Behnke and C. Dold), which reviews data from resistant and susceptible mouse strains and the importance of innate responses in the liver. The use of *Ascaris* as a model for studying nematode neurobiology is very well detailed in Chapter 6 (A. O. W. Stretton and A. G. Maule) and relevant to the search for new classes of anthelmintics.

Epidemiology and its application to monitoring the efficacy of the WHO drug administration programme and potential threat of drug resistance are clearly discussed in Chapters 7–9. This section begins with a comprehensive overview of the factors influencing infection intensity and the need to validate data locally. Chapter 8 (C. D. Criscione) provides an excellent discussion on parasite population genetics and population size affecting parasite adaptability and epidemiology. Different scenarios that impact on mathematical modelling of infection and optimal use of models to direct control strategies are reviewed in Chapter 9 (T. D. Hollingsworth, J. E. Truscott and R. M. Anderson).

Host and parasite genetics are discussed in chapters 10–12, beginning with debate on the genetic relationship of *A. lumbricoides* and *A. suum* (M. Betson, P. Nejsum and J. R. Stothard). The availability of genome and transcriptome data should help resolve this, as well as providing a wealth of information for rational drug and/or vaccine design (Chapter 11, A. R. Jex *et al*.). Host genome data should help identify genetic determinants of predisposition to *Ascaris* infection and build on the excellent pedigree analysis of the Jirel population in Nepal, discussed in Chapter 12 (S. Williams-Blangero *et al*.).

The final section of the book focuses on clinical aspects and public health. The WHO strategy for anthelmintic control of soil transmitted helminths is outlined in Chapter 15 (A. Montresor, A. F. Gabrielli and L. Savioli), while the impact, diagnosis and control of *Ascaris* in pigs are discussed in Chapter 14 (S. M. Thamsborg, P. Nejsum and H. Mejer) and 16 (J. Vlaminck and P. Geldhof). Studies from both the human and veterinary fields emphasize the importance of combining two key control strategies: anthelmintic treatment and improved hygiene. Applications of novel data on host genetics, epidemiological modelling and parasite genomics/transcriptomics to control strategy optimization are highlighted in this book. The editor and all contributors have done an excellent job in producing such an informative and accessible resource.

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