

Preface

It is more than a 100 years since *Cryptosporidium* parasites were first described by Edward Tyzzer.¹ In addition to the initial discovery, two events stand out for having significantly impacted our awareness of these parasites and the diseases they cause. The HIV epidemic and the emergence of cryptosporidiosis as a potentially severe opportunistic infection in people living with AIDS was significant, not only because of the clinical implications but because it motivated a substantial research effort and a desire to better understand these parasites. A second notable event was the waterborne cryptosporidiosis outbreak which occurred in Milwaukee in 1993. The importance of this outbreak is illustrated by the fact that the article² reporting on the epidemiological investigation of the outbreak was cited over 600 times, more than any other paper with the term *Cryptosporidium* in the title listed in PubMed. Subsequently, the application of genotyping methods based on the polymerase chain reaction revealed the common occurrence of cryptosporidiosis in animals, particularly in young livestock, and the importance of zoonotic transmission of this parasite. Whereas waterborne outbreaks have provided incentives for improving drinking water quality, progress in treatment and prevention of cryptosporidiosis has been disappointing. As described in this book, basic research has generated a wealth of information on many aspects of *Cryptosporidium* biology, but this knowledge has not had a decisive impact on the progress towards the production of effective treatments or vaccines. Cryptosporidiosis thus remains a serious infection, not only for immunocompromised individuals but also for children living in underdeveloped countries. In recognition of the disease burden, and to underline its link with poverty, the World Health Organization (WHO) has included cryptosporidiosis in the Neglected Diseases Initiative since 2004.

¹ Tyzzer, E.E. (1907) A sporozoon found in the peptic glands of the common mouse. Proc. Soc. Exp. Biol. Med. 5,12–13.

² Mac Kenzie WR, Hoxie NJ, Proctor ME, Gradus MS, Blair KA, Peterson DE, Kazmierczak JJ, Addiss DG, Fox KR, Rose JB, et al. (1994) A massive outbreak in Milwaukee of *Cryptosporidium* infection transmitted through the public water supply. N Engl J Med. 331, 161–167.

The content of this book reflects the extent to which our knowledge of *Cryptosporidium* parasites has expanded in recent years. The 13 chapters are written by scientists, clinicians and veterinarians having many years of experience with these parasites and who together have published hundreds of research papers. This practical experience and scholarly activity is reflected in the quality of the contributions. The book covers a wide range of subjects, ranging from clinical cryptosporidiosis to the epidemiology, taxonomy, host-parasite interaction and molecular biology. Recent progress in the field of *Cryptosporidium* “omics” is also covered.

We have grouped the chapters in four parts. Part I covers taxonomy and epidemiology. It includes four chapters on the molecular taxonomy, epidemiology, evolution and ecology of *Cryptosporidium* species infecting humans, livestock and other vertebrates. Part II covers “omics”-related subjects (genomics, transcriptomics and proteomics), as well as an overview of *Cryptosporidium* metabolism and its many unique features. Host-parasite interaction is the focus of Part III. Clinical cryptosporidiosis, immunology and the current state of drug development are covered. The last part is devoted to waterborne cryptosporidiosis. Two chapters review the implications of *Cryptosporidium* oocysts in drinking and recreational water and give an overview of treatments to remove and inactivate oocysts in drinking water.

This book is evidence of the devotion of 34 authors residing in seven countries who together have invested a significant effort in reviewing and interpreting recent progress in their respective fields. The editors would like to express their gratitude to the authors for taking on this task.

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Cacciò, S.M.; Widmer, G. (Eds.)

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