

Preface

Parasitic protozoa comprise a large number of species, including some which are agents of human and veterinary diseases such as malaria, leishmaniasis, Chagas disease, African trypanosomiasis, amebiasis, trichomoniasis, giardiasis, toxoplasmosis, coccidiosis, theileriosis, and babesiosis, to mention only the more important ones. Some of these protozoa, as is the case with *Trichomonas*, present a simple life cycle. For others, however, as occurs with Apicomplexa (which includes *Plasmodium*, *Toxoplasma*, *Eimeria*, etc.) and some trypanosomatids, the life cycle is relatively complex, displaying several developmental stages in the vertebrate host and, in some cases, in invertebrate hosts. These protozoa are also of interest from a cell biology point of view, as they present special cytoplasmic structures and organelles that have been studied in some detail during the last several years, providing new information of general biological interest. These studies have discovered new metabolic pathways that take place in these organelles and open up alternate possibilities for the identification of different drug targets and innovative drugs to be used for the treatment of patients and animals with diseases caused by protozoa.

There are currently only a few publications that review the available data on the cell biology of pathogenic protozoa. This Microbiology Monographs volume covers the current and most recent advances made on relevant cytoskeletal structures and organelles found in parasitic protists. Renowned scientists, some of whom were directly involved in the discovery and characterization of these organelles, have contributed reviews that incorporate recent results obtained using modern cell biology and molecular approaches, including genomics and proteomics. Some important organelles such as the hydrogenosome and mitosomes were not reviewed here as they were examined in detail in a previous volume of this series (Tachezy 2008).

The first group of reviews deals with cytoskeletal structures such as the mastigont system found in trichomonads (written by Marlene Benchimol), the subpellicular microtubules, better characterized in trypanosomatids and in some Apicomplexa (written by Wanderley de Souza and Marcia Attias), and the paraflagellar rod, a characteristic feature of the flagellum of some protists (written by Johana Buisson and Philippe Bastin).

The second group deals with structures and organelles involved in the synthesis and secretion of macromolecules, as well as in the uptake of molecules through an endocytic process. These include the flagellar pocket of trypanosomatids (written by Paul McKean and Keith Gull), the reservosome of *Trypanosoma cruzi* (written by Narcisa Leal Cunha-e-Silva, Celso Sant'Anna, Miria Pereira, and Wanderley de Souza), the megasome found in *Leishmania* (written by Diane McMahon-Pratt, Tania Ueda-Nakamura, and Yara Traub-Cseko), the various organelles and the traffic of vesicles in *Entamoeba histolytica* (written by Sherri Smith and Nancy Guillen), the secretory organelles found in members of Apicomplexa (written by Jean François Dubremetz), and the secretory events that take place during the process of encystation of *Giardia lamblia* (written by Fernando Rivero, Dana Muller, and Hugo Lujan).

The final group of reviews deals with various organelles, which are characteristic features of protozoa. These include the kinetoplast-mitochondrion complex of trypanosomes and related flagellates (written by Julius Lukes, Hassan Hashimi, Zdenek Verner, and Zdenka Cicov), the apicoplast, an ancient organelle found in Apicomplexa (written by Swaiti Agrawal, Sethu Nair, Lilach Sheiner, and Boris Striepen), the glycosomes found in Kinetoplastida (written by Fred Opperdoes), and the acidocalcisome found in several protozoa (written by Paul Ulrich, Rozana Cintrón-Moret, and Roberto Docampo).

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Reference

Tachezy J (ed) (2008) Hydrogenosomes and mitosomes: mitochondria of anaerobic eukaryotes. In: Microbiology monographs, vol. 9. Springer, Berlin Heidelberg, New York

Structures and Organelles in Pathogenic Protists

de Souza, W. (Ed.)

2010, XII, 324 p. 78 illus., 19 illus. in color., Hardcover

ISBN: 978-3-642-12862-2