The Apicomplexan Parasite *Toxoplasma* gondii

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Toxoplasma gondii is a ubiquitous zoonotic parasite with an obligatory intracellular lifestyle. It relies on a specialized set of cytoskeletal and secretory organelles for host cell invasion. When infecting its felid definitive host, *T. gondii* undergoes sexual reproduction in the intestinal epithelium, producing oocysts that are excreted with the feces and sporulate in the environment. In other hosts and/or tissues, *T. gondii* multiplies by asexual reproduction. Rapidly dividing tachyzoites expand through multiple tissues, particularly nervous and muscular tissues, and eventually convert to slowly dividing bradyzoites which produce tissue cysts, structures that evade the immune system and remain infective within the host. Infection normally occurs through ingestion of sporulated oocysts or tissue cysts. While *T. gondii* is able to infect virtually all warm-blooded animals, most infections in humans are asymptomatic, with clinical disease occurring most often in immunocompromised hosts or fetuses carried by seronegative mothers that are infected during pregnancy.

Toxoplasma gondii		toxoplasmosis	parasite	tissue cyst	endodyogeny	lytic cycle
life cycle	oocyst	Apicomplexa				

Toxoplasma gondii is frequently described as one of the most successful parasites, due to its ubiquitous distribution, the wide range of host species it is able to infect and its high prevalence rates around the world. The amenability of *T. gondii* to laboratory conservation and propagation both in vivo and in vitro as well as to genetic manipulation have made this parasite a widely used biological model for the study of conserved biological processes in closely related parasites more challenging to manipulate in a laboratory setting ^[1].

T. gondii was initially observed in the tissues of the rodent Ctenodactylus gundi by Nicolle and Manceaux (1908) ^[2] and in the tissues of a rabbit by Splendore (1908) ^[3]. At the time, the host Ctenodactylus gundi was erroneously identified as Ctenodactylus gondi, which resulted in the specific epithet of T. gondii. The name of the genus was given as a reference to the shape of the parasite, from the Greek tóxon meaning arc or bow ^[4]. *T. gondii* is an obligate intracellular parasite and is the causative agent of toxoplasmosis in humans and animals. *T. gondii* has a worldwide distribution and infects a wide variety of animals, although only a fraction develop disease ^{[5][6]}. Toxoplasmosis is usually acquired through ingestion of either sporulated oocysts that are shed by the felid definitive host and found in food and water supplies, or through consumption of contaminated meat products containing tissue cysts. Rapidly dividing tachyzoites readily invade and replicate in many tissues and cell types and, if not kept in check by the host's immune system, extensive proliferation then causes acute disease and severe tissue pathology in multiple organs ^[2]. Thus, toxoplasmosis represents a health risk mainly for immunocompromised individuals and for fetuses upon primary infection during pregnancy ^[8]. Therapeutic and

prophylactic options currently available are either insufficient, or cause severe adverse side effects in both humans and animals ^[9].

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