

Master's Thesis Offer

*at Institute of Biology, Department of Molecular Parasitology
Humboldt University of Berlin*

Optogenetic control of intersecting cGMP and calcium signaling in the acute stage of *Toxoplasma gondii*

We are looking for a highly motivated master's student, who has an interest in acquiring new lab skills in the parasite research using the state of the art technology. Our research group studies the biology of obligate intracellular parasite *Toxoplasma gondii*, which can infect one third of the human population and may cause severe life-threatening diseases in immunocompromised individuals. Infection and pathogenesis of *Toxoplasma* rely on the cGMP-mediated regulation of Ca²⁺-signaling during the lytic cycle including successive motility-dependent invasion (entrance to the host) and egress (exit from cell) processes.

Focus of the project:

The proposed master thesis project will mainly focus on the identification of target downstream mediators and effector proteins of cGMP and calcium signaling. The functional and physiological importance of the selected candidates on the growth and the virulence of the parasite will be examined by "knockout" strategy during the acute stage of *T. gondii*.

Methods:

This project requires a rich repertoire of interdisciplinary methods to meet the proposed objectives. We will utilize a transgenic parasite strain which expresses a light-activated rhodopsin-guanylate cyclase (RhoGC) fusion protein to induce cGMP production by green light. A custom-built microplate-compatible LED device will be used for light illumination at different parasitic stages. The core techniques of *in vitro* parasite culturing, genetic manipulation, molecular cloning, phenotyping of transgenic parasites, fluorescent imaging, ELISA-based cGMP and calcium measurements will be implemented.

Requirements:

Candidates are expected to have a lab experience for basic applications. Theoretical knowledge on molecular biology would also be highly appreciated.

If interested, please send your application with a brief CV to:

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