Junior Science Communications
Faculty of Applied Sciences, UiTM Shah Alam
https://journal.uitm.edu.my/ojs/index.php/JSC

E-ISSN 2637-0689
Vol 41 2024

Colloquium on Applied Sciences 2024
19-21 January 2024, Faculty of Applied Sciences, UiTM Shah Alam, Malaysia

Antigenic Proteins of *Toxoplasma Gondii*; Unravelling Immunogenicity and Potential Applications

Norazrin Adlina Zamri[a], Tengku Idzzan Nadzirah Tengku Idris[a*]

Structured Abstract

Background: The study of *Toxoplasma gondii's* antigenic proteins is crucial for understanding its biology and interactions with the host immune system. It helps identify the specific proteins released during different phases of the parasite's life cycle. This information can lead to diagnostic techniques, innovative treatment approaches, and successful immunization programs, improving public health outcomes.

Main body: Surface antigen can be found on the surface of the parasite which known as plasma membrane, rhoptry protein can be found in rhoptries, dense granule protein can be found in dense granules which present in cytoplasm of parasite and lastly, micronemal proteins can be found in micronemes which the unique organelle at the anterior end of parasite. The potential diagnostics applications of antigenic proteins in *Toxoplasma gondii*, serological test and PCR are widely used for detection of SAG, ROP, GRA and MIC. Strain-specific variations are not suitable for GRA and MIC because it is introducing the risk of cross-reactivity, where an assay designed for one strain may inadvertently detect other strains, leading to inaccurate results. Multiplex assay is not suitable too because are limited by their capacity to simultaneously detect multiple targets, and designing such assays requires a full understanding of the specific protein variations and potential cross-reactivity issues. Additionally, the discovery of new *T. gondii* antigenic proteins were discovered. 16 antigenic proteins were discovered which are ROP1, GRA2, GRA4, GRA5, GRA6, GRA7, GRA14, MIC1, MIC2, and MAG1 but only 4 antigenic proteins showed strong immunogenicity which are ROP6, MIC12, SRS29A and SRS13.

Research gap: The review has highlighted potential antigenic proteins that can be used for vaccine's development or diagnostic assay study. However, specificity and sensitivity study of the antigenic proteins remains under-explored.

Conclusion: In conclusion, the types, immunogenicity, structures, and functions of antigenic proteins were successfully discussed in this review. The information is crucial for disease management.

Keywords: *Toxoplasma gondii*, toxoplasmosis, antigenic proteins, surface antigen proteins micronemal protein, rhoptry protein, dense granule protein

*Correspondence: tengkuidzzan@uitm.edu.my

[a]School of Biology, Faculty of Applied Sciences, Universiti Teknologi MARA, Shah Alam, Malaysia