**"** **Identifying Early Therapeutic Targets in *Opisthorchis viverrini* Infection: A Comparative Immunoproteomic Analysis of Sera from Resistant Mice and Suceptible Hamsters "**

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**ABSTRACT**

Opisthorchiasis, caused by *Opisthorchis viverrini*, continues to pose a significant public health challenge, particularly in the Lower Mekong Basin of Southeast Asia, necessitating urgent attention and intervention. *O. viverrini*, a foodborne trematode, emerges as a significant yet understudied and neglected parasite, afflicting approximately 9 million individuals in South-east Asia. The economic ramifications of this parasite in Thailand, where it is prevalent, are striking; the associated medical care and productivity losses amount to an estimated USD $120 million annually. Our research aims to uncover potential drug targets and vaccine candidates within the parasite by leveraging insights from coevolved resistant host species. We employed sodium dodecyl sulfate-polyacrylamide gel electrophoresis (SDS-PAGE) and western blotting techniques to investigate the kinetics of host immune responses targeting worm proteins during an early stage of infection. These methods assessed antibody responses in two animal species, hamsters and mice, following infection with *O. viverrini* at different intervals. The results demonstrated the propensity of mice to effectively eliminate *Ov*-infection, accompanied by a robust antibody reaction towards approximately 80-100 Kd proteins, a significant component of NEJ (Newly excysted juveniles) and immature worm tegumetal extract. Conversely, hamsters displayed a notable depression in antibody response during the early stage of *O. viverrini* infection. Expanding on these initial findings, we aimed to identify a set of immunoreactive proteins in the tegument and somatic extract obtained from NEJ, immature and mature adult worms on Days 1, 7, 14 and 28 post-infection, respectively, in both hosts and identify proteins using Mass spectrometry analysis. The comparative analysis of serum samples from hamsters and mice may provide insights into the specific protein(s) targeted by mice early, leading to the successful elimination of the infection. The knowledge can be used in parasitic infections, and discovering these proteins by non-susceptible hosts can be a key to identifying early diagnostic biomarkers and potential therapeutic targets against parasitic infections.

**Keywords:** *Opisthorchis viverrini*, Proteomics, immunoproteomics, biomarker, Theraputic target

Alok Kafle, with over a decade's expertise in biomedical research, specializes in parasitology, immunology, and molecular techniques. He focuses on identyfying therapeutic targets and developing *Opisthorchis viverrini* vaccines using multi-omics analyses for host-pathogen interactions. Beyond science, he has involved himself to community-centred disease control interventions like Magic Glass and the Lawa Model. Both rooted in the EcoHealth/One Health approach, these innovative models consider human, animal, and environmental health perspectives. Alok is committed to applying this approach for designing sustainable solutions to complex global health challenges.



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