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Systematic approach to studying variant surface antigens in rodent malaria parasites

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Hosted by Dr Yang Yuansheng

Seminar Abstract

Plasmodium parasites have evolved to grow in terminally differentiated erythrocytes, which are anucleated and have very little biosynthetic capacity. Due to the lack of biosynthetic capacity, the parasite has to export many proteins into the host cell for its survival. A significant number of these exported proteins are displayed on the host cell surface and play a role in immune evasion and disease pathogenesis. Many of these surface proteins are encoded by multigene families and are termed variant surface antigens(VSAs). Although we have known about VSA and the multigene families that encode them for more than a decade, our understanding of their importance in parasite biology and pathology is minimal. This is partially due to the inability to study these genes due to the high degree of genetic conservation among members of these multigene families, thus making genetic manipulation difficult. To address this problem, we have developed a genetic approach to force the expression of specific members of the multi-gene family from its endogenous promoter in *P. yoelii*. With the parasite expressing only one member of an endogenously tagged VSA, we are able to show the specific localization this defined member within the parasite throughout its development in the asexual lifecycle. Using this endogenous tagging approach, we can now study these genes in isolation and this opens up the potential to initiate a comprehensive and systematic study of these VSA in terms of transcriptional control and potential role in pathogenesis.

About the Speaker

Han Ping received his Bachelors of Science degree in Biological Sciences from Nanyang Technological University in 2012. He joined the SIgN-NTU Immunology PhD program in 2014. His PhD project involves the study of how multigene families in malaria is implicated in disease pathogenesis. In particular, focusing on the study of *Plasmodium* interspersed repeats (PIRs) which are present in all *Plasmodium* species affecting humans, non-human primates and rodents.