

## Evolving a fungal pathogen into a gut symbiont



### Dr Gloria Tso

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Level 6, Centros

Hosted by Dr Andy Tan

### Seminar Abstract

*Candida albicans*, an opportunistic fungus found in the gut, usually maintains its commensal state without causing harm to the host but it can switch to be a deadly pathogen once disseminating into the bloodstream. Gastrointestinal (GI) tract is holding trillions of microbes, however, how *Candida albicans* interacts with others microbes and immune cells in the GI tract remains unknown. In this study, by serial passaging of *Candida albicans* in the murine GI tract and placing the *Candida albicans* under the evolutionary pressure without the presence of gut bacteria, we found *Candida albicans* became avirulent by losing its ability to form hyphae. Such phenotypic change is resulted from multiple mutations on various filamentation-related genes, especially on the *FLO8* gene. The GI tract not only forced the *Candida albicans* to lose its pathogenicity, but also drove *Candida albicans* to be a beneficial commensal. By immunizing mice with the evolved *Candida albicans*, mice were protected from a secondary challenge of the wild-type *Candida albicans*. Such immunization further provides cross-protection against different fungal and bacterial pathogens. This cross-protection mechanism resembled “trained immunity” which is rapid onset, short lifetime and pathogen-asppecificity. The study revealed the evolutionary force in the GI tract governed the emergence of mutualism between a fungus and its host.

### About the Speaker

Dr. Gloria Tso received her PhD in Immunology from the University of Hong Kong, Department of Paediatrics and Adolescent Medicine. Her PhD study focused on projects including genetic study on tuberculosis and SLE patients, as well as, studying the modulation of osteogenesis on mesenchymal stem cells in inflammatory bone diseases. After her PhD, she joined the Stem Cell Consortium of the University of Hong Kong on characterizing stem cells-derived cardiomyocytes. She next relocated to Singapore and joined Singapore Immunology Network in A\*STAR to continue pursuing her interests on fungal infection and vaccine development.