

3<sup>rd</sup> International Conference on

# MASS SPECTROMETRY

October 10-11, 2016 Kuala Lumpur, Malaysia

## LC-MS study of a novel class of virulence factor Mp1p in *Talaromyces marneffei*: A novel virulence mechanism of pathogenic fungi

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*Talaromyces marneffei* is the most important thermally dimorphic fungus causing systemic mycosis in HIV-positive patients in China and Southeast Asia. We recently showed that the secreted *T. marneffei* protein Mp1p is a novel virulence factor of *T. marneffei*. Yet the mechanism governing its virulence was unknown. We have performed pull-down of Mp1p protein against the *T. marneffei* infected cell lysates of J774 macrophage cells. LC-MS characterization of the pull-down extract indicated that the Mp1p-LBD2 has high affinity for a key human proinflammatory lipid mediator, arachidonic acid (AA). The first line defense of our body against microbial infection is achieved through inflammatory response, which is a complex but highly coordinated series of events tightly controlled by a number of mediators, many of which are derived from AA or its metabolites. Therefore, we have performed structure, function and binding investigations of Mp1p against AA by combining biophysical, structural biology and cell biology approaches. Finally, we showed in cell-based LC-MS lipidomics that the AA capturing property of Mp1p is functionally relevant because *T. marneffei* is able to reduce the availability of cellular AA and decrease the production of downstream eicosanoids. Adding together, these results support that Mp1p is an important virulence factor for intracellular survival of *T. marneffei* through trapping of pro-inflammatory mediators. This work has provided important insight into the host defense evasion and pathogenesis of *T. marneffei*, which may extend to other fungi or pathogenic bacteria. Such knowledge may help to develop better chemotherapeutic intervention of fungal diseases in future.

### Biography

Kong Hung Sze holds a PhD in Chemistry from the University of British Columbia, Canada, and Post-doctoral studies from Oxford University Inorganic Chemistry Laboratory. He is currently an Assistant Professor in the Microbiology department of the University of Hong Kong. His research interests lie in the fields of influenza virus and host interaction; structural biology studies of virulence factors of *Talaromyces marneffei* and other emerging human pathogens, lipidomics and metabolomics studies of emerging and reemerging pathogens. He has published more than 90 papers in the international journals.

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