NUS National University of Singapore | Department of Biological Sciences, Faculty of Science

SEMINAR

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Hosted by Prof J Sivaraman

Design of inhibitors that target disease-promoting carbohydrate-recognising proteins



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Carbohydrate-recognising proteins (lectins) have significant roles in disease progression. Viruses and bacteria often utilise lectins for host-pathogen interactions, facilitating attachment to host cells and subsequent infection. Galectins recognise and bind to carbohydrates during critical stages of their involvement in progressing cancer growth, tumour survival, and promoting metastasis. The design of inhibitors to block lectin function is an important approach to reduce and/or eliminate disease progression but is often challenging due to the inherent nature of carbohydrate-binding sites. Our studies incorporate X-ray crystallographic elucidation of the atomic structures of two lectin-based systems that progress human diseases: the rotavirus spike lectin domain (VP8*) and human galectin-3 –with the latter identified as having key roles in cancers such as lung, breast and the blood cell cancer acute lymphoblastic leukaemia. Our investigation informs on how these proteins interact with particular carbohydrates, giving insight into how they achieve their function, and providing critical information for progressing our structure-based design of potent and selective inhibitors

Artwork by Ann Nee, DBS, NUS