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

BIOLOGY COLLOQUIUM

Friday, 22 March 2019 | 4pm | DBS Conference Room 1

Hosted by Dr Lu Gan

By **Zhucheng Chen**

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About the Speaker

- *2003-2009 (Ph.D. Weill Cornell Graduate School of Medical Science, New York, USA)*
- *2008-2011 (Postdoctoral Fellow, UT Southwestern Medical Center, Dallas, TX)*
- *2011-present (Associate Professor, School of Life Sciences, Tsinghua University)*

Mechanism of ATP-dependent Chromatin Remodeling

Chromatin remodelers utilize the energy of ATP to alter the position and compositions of nucleosomes, playing major roles in controlling the chromatin structure in cells. How these enzymes remodel the nucleosome is not completely understood. To understand the remodeling reaction, here we discuss the cryoEM structures of the Snf2-nucleosome complex in different nucleotide bound states. Snf2 mainly interacts with the phosphate backbone of one DNA gyre of the nucleosome through its helicase motifs, suggesting a conserved mechanism of substrate engagement. Snf2 in the ADP state induces one base-pair DNA bulge at the site of binding (superhelical location 2, SHL2). The DNA distortion propagates to the proximal end, leading to sliding in of the DNA from the entry side. ATP binding triggers conformational changes of the enzyme, resetting the nucleosome to a relaxed state. The histone octamer remains essentially unperturbed during the ATPase cycle. Together, these findings suggest a "DNA wave" mechanism for chromatin remodeling.