Seminar/Talk

Single-Particle Cryo-EM: A rising star in structural biology

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Host:

Cryo-EM is currently revolutionizing the field of structural biology. Due to recent advances in detector technologies, hardware & software improvements, this method is becoming more and more mainstream in solving high-resolution structures. It complements methods such as X-ray crystallography & NMR spectroscopy with the advantage of not having to form well-ordered crystals or having an upper size limit. Progress in the field of single-particle cryo-EM will be discussed with examples of soluble & membrane protein complexes yielding resolutions of better than 3 Å. A study on 200 kDa Mg2+ channel CorA will be used as a detailed example. CorA is a homo-pentamer and is gated by intracellular Mg2+. We determined the structures of CorA in the presence and absence of Mg2+ using single-particle cryo-EM. The five-fold symmetric Mg2+-bound closed state of CorA at an overall 3.8 Å resolution reveals side-chain densities as well as densities for several magnesium ions. Cryo-EM of Mg2+-free open state CorA revealed dramatic differences in the conformation of the channel with large asymmetric changes in the soluble domain of the pentameric complex suggesting an unprecedented gating mechanism.

Monday, January 16, 2017 08:45am - 09:45am
Mondi Seminar Room 2, Central Building

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