Thu 9. May 2019
Time: 16:00 h

University of Zürich - Irchel, Winterthurerstr. 190, 8057 Zürich
Lecture Hall Y03-G-85

Everybody is welcome

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Cristina Paulino is Assistant Professor at the Groningen Biomolecular Sciences and Biotechnology Institute, University of Groningen (NL).

This lecture is hosted by Prof. Raimund Dutzler (UZH).

NCCR TransCure Lecture in Biology
by Cristina Paulino

The KdpFABC Complex: What Happens When a P-type ATPase Hijacks an Ion Channel

P-type ATPases ubiquitously pump cations across biological membranes to maintain vital ion gradients. Among those, the chimeric K^+ uptake system KdpFABC is unique. While ATP hydrolysis is accomplished by the P-type ATPase subunit KdpB, K^+ has been assumed to be transported by the channel-like subunit KdpA. A first crystal structure uncovered its overall topology, suggesting such a spatial separation of energizing and transporting units. The use of single particle cryo-EM allowed us to determine two additional structures of the 157 kDa, asymmetric KdpFABC complex in an E1 and E2 state, at 3.7 Å and 4.0 Å resolution, respectively. Unexpectedly, the new structures suggest a so far unprecedent transport mechanism through two half-channels along KdpA and KdpB, uniting the alternating-access mechanism of actively pumping P-type ATPases with the high affinity and selectivity of K^+-channels. This way, KdpFABC functions as a true chimeric complex, synergizing the best features of otherwise separately evolved transport mechanisms.

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