MUI Lecture Series

Exploring the mechanism of organelle identity of endosomes and lysosomes and membrane contact sites

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5:00 pm
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Our research is focussed on the machinery responsible for membrane dynamics (fission and fusion) at endosomes and lysosomes/yeast vacuoles. Our main interests are small regulators, the Rab GTPases Rab5 (Vps21) and Rab7 (Ypt7), and their interaction partners, in particular the tethering complexes CORVET and HOPS.

A second major focus are membrane contact sites of vacuoles, in particular with mitochondria and the ER, which also depend on the Rab7-like Ypt7.

Defects in the endolysosomal system result in several serious diseases such as neuronal defects or bleeding disorders. An understanding of the underlying machinery thus offers opportunities to interfere with such defects.
To explore the role of factors involved in endosome and lysosome biogenesis, we follow different approaches, including in vivo assays to trace proteins in the cell, the isolation of large complexes, their biochemical and biophysical characterization, in vitro assays to measure organelle fusion and enzymatic activities, structural analyses and genetics. Main collaborators include Fulvio Reggiori (Groningen), Stefan Raunser (Dortmund), and Daniel Kümmel (Osnabrück). We profit from excellent support by the SFB 944 collaborative research center in Osnabrück and Münster and the CellNanOs groups with its excellent imaging facilities to monitor cellular microcompartments in vivo and in vitro.

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