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Unifying Concepts in Catalysis

UniCat Colloquium

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Elucidating the functions and mechanisms of inositol pyrophosphate messengers with chemical tools

By integrating signaling cues with metabolic status, cells are able to modulate a range of processes according to their internal resources. The diphosphoinositol polyphosphates (PP-InsPs) are a unique group of highly phosphorylated messengers known to control glucose uptake, insulin signaling, and energy homeostasis, and thereby provide an important link between signaling and metabolic networks. It is thought that PP-InsPs exert their pleiotropic effects as allosteric small molecule regulators and via pyrophosphorylation of protein substrates, but most details in PP-InsP signaling have remained elusive due to a paucity of suitable reagents.

Our group is taking chemical approaches to uncover the molecular mechanisms in PP-InsP signaling. We have designed non-hydrolyzable PP-InsP analogues and have utilized these analogs for the affinity purification of inositol polyphosphate binding proteins. In parallel, we devised a method that provides easy access to pyrophosphopeptides. The pyrophosphopeptides were subsequently employed for the development of specific enrichment procedures and for mass spectrometry-based detection of endogenous pyrophosphoproteins. Overall, our data contributes to a better understanding of the complex PP-InsP signaling landscape, and suggests that the inositol pyrophosphates can intersect with signaling and metabolic pathways via two distinct mechanisms.

Wednesday, June 15, 2016 at 5:15 PM
TU Berlin, Institute of Chemistry
Straße des 17. Juni 115, 10623 Berlin

Building C, Lecture Hall **C 264**

Prof. Dr. Hildebrandt (TUB)
Organizer

Coffee and cake will be served 30 minutes before the lecture. Guests are cordially invited to attend!
Prof. Dr. Matthias Driess - Chair of the Cluster of Excellence UniCat - www.unicat.tu-berlin.de