



Leibniz-Institut für Analytische  
Wissenschaften – ISAS – e.V.

Dortmund & online

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# COLLOQUIUM

## Mechanism-Based Disease Redefinition for Precision Diagnosis and Medicine

### Speaker:

**Prof. Dr. Harald H.H.W. Schmidt**, head of the Department of  
Pharmacology & Personalised Medicine, MeHNS, of the Faculty of  
Health, Medicine & Life Science at Maastricht University.

### Time:

Thursday, November 03, 2022, 1 pm

### Venue:

ISAS Campus, Lecture Hall  
Otto-Hahn-Straße 6b  
44227 Dortmund

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Webex: <https://bit.ly/30vWUAn>

Meeting-ID: 2733 036 2905

Password: MjhNfSFJ573

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## Abstract

We do not understand almost any human disease and thus describe them by symptoms in organs. Instead of curing we chronically treat, and do this in a highly ineffective manner, i.e., with high numbers-needed-to-treat (NNT). To this, reproducibility issues with almost 60% of all biomedical publications and wrong incentives such as high impact factor papers contribute. For complex diseases, most drugs are highly ineffective, and the success rate of drug discovery is in a constant decline. Whilst low quality, reproducibility issues, and translational irrelevance of most basic and preclinical research have contributed to this, the current organ-centricity of medicine and the one disease-one target-one drug dogma obstruct innovation most profoundly. The biggest conceptual error in Medicine and innovation roadblock is to split up the human body organ by organ, including organ-specific research disciplines pretending one can define a disease within an organ. Systems Medicine overcomes this by re-integrating the human body in an evidence-based manner enabled by data science and multiscale bioinformatics. Descriptive disease phenotypes and umbrella terms are replaced by endotypes defined and diagnosed by causal, multi-target signaling modules that also explain respective comorbidities. Importantly, these modules are distinct from classical pathways. Modules more often than not contain several fragments of several different canonical pathways. Precise and effective therapeutic intervention depends on precise inclusion and exclusion of module members and is subsequently achieved by synergistic multi-compound network pharmacology, ideally through drug repurposing, obviating the need for drug discovery, and speeding up the clinical translation. With this, disease are re-defined mechanistically and both diagnosed and treated with high precision.