

SiGN SEMINAR

Hosted by Dr Wu Wei



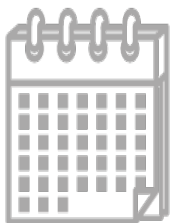
Prof Albert Heck

Distinguished Faculty of Science Professor
Utrecht University, The Netherlands

Albert Heck is leading expert in protein mass spectrometry and structural biology. He has made important advances in quantitative proteomics, post-translational modifications, native and crosslinking mass spectrometry and structural analyses of protein assemblies. He is a member of EMBO and KNAW, and recipient of the John Fenn Award (ASMS, 2026), Thomson Medal (IMSF, 2018), Krebs Medal (FEBS, 2018), Spinoza Prize (Dutch Nobel, 2017), ACS Field and Franklin Award (ACS, 2014), Discovery Award (HUPO, 2013).

A next frontier in proteomics: Towards full *de novo* sequencing of endogenous antibodies

Immunoglobulins are amongst the most abundant proteins in our body, and in our blood. They play a key role in our humoral immune system, protecting us against microbial infections. Antibody diversity in humans is enormous and arises primarily through V(D)J recombination in B cells that are responsible for antibody production. This mechanism, along with junctional diversification, generates hypothetically an immense repertoire of antibodies, often estimated to range between 10^{11} to 10^{20} unique sequences, enabling our body to make antibodies against almost any pathogen. This vast pool of sequence diversity does not allow genome-template guided proteomics to identify the sequences of endogenous antibodies but makes protein-centric *de novo* sequencing essential. In our laboratory we aim to advance antibody *de novo* sequencing using hybrid fragmentation and novel proteases, to boost the confidence of Fab sequencing. We also use the Bruker timsOMNI, Sciex 8600 and Thermo Excedion to obtain information on the complexity of the human antibody repertoire, by specifically targeting the hypervariable antibody CDR regions. Finally, we have developed novel search algorithms to resolve template-free protein sequence searches and post-translational modifications. Collectively these broaden our understanding of the incredible complexity in the human immunoglobulin repertoire.



1 October 2026 (Thursday)
2.00 – 3.00 PM (Singapore Time)

SiGN Seminar Room
8A Biomedical Grove, Immunos, #04-06
Singapore 138648

Seminar is
open for all
to attend.

Registration
is not
required.

