Abstract: Pore-forming proteins play important roles as virulence factors in bacteria or in the defence against infection in eukaryotes. After secretion, these proteins assemble on the membrane of the target cell into arc- and ring-shaped polymers that ultimately insert into the lipid bilayer to form large (~20-30 nm) transmembrane pores. In the first part of the seminar, I am going to discuss our recent progress towards imaging oligomer formation and membrane permeabilization in real time by fluorescence microscopy in reconstituted systems. Single-molecule analysis of the fluorescence movies allows us to determine intermediates and assembly kinetics of pore formation. In the second part of the seminar, I am going to present how we use these pore-forming proteins as tools to measure the stability of the HIV capsid. Mutational analysis pinpoints important capsid residues involved in cofactor packaging and control of capsid assembly and disassembly.

Bio: Till Boecking studied biochemistry at the University of Bonn in Germany followed by PhD in biophysics at UNSW with Hans Coster and a postdoc in chemistry with Justin Gooding focusing on molecular self-assembly. He then headed to Boston as a Cross-Disciplinary HFSP Fellow to work on the endocytosis machinery with cell biologist Tom Kirchhausen at Harvard Medical School. Till now leads the Molecular Machines Group at the EMBL Australia Node in Single Molecule Science at UNSW Sydney. His research is focused on resolving the assembly/disassembly pathways of supramolecular protein machines using single-molecule fluorescence microscopy.