

ICB seminar series 2024/25

chairman: Prof. Dr. Kjell Jorner

CAPTURING AND ASSAYING CLINICALLY RELEVANT TARGETS

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Wednesday, 16/04/2025, 4 pm
ETH Hönggerberg, tba

Abstract: We design and develop molecular recognition and transduction protocols, including the utilization of AC field-assisted microfluidic target capture at nanoparticles prior to presentation at sensors. I will present an example of the ultrasensitive (cancer progression indicative) anti-p53 antibody quantification using antigen-mimicking and signal-generating nanoparticles. The need to capture targets at planar interfaces is a ubiquitous requirement across many sensor/diagnostic disciplines. I will show that microfluidic channel compression promoted convective flux hugely accelerates capture, response magnitude and selectivity. Finally, it is clear that an effective intervention in neurodegeneration will require facile pre-symptomatic diagnosis. We have developed a toolbox where nanoparticles isolate neuronal exosomes. The amplified shotgun assaying of the synuclein load of these enables the pre-symptomatic identification of Parkinson's risk in patients years before current diagnosis.

Bio: is a Professor of Chemistry at Oxford & Senior Tutor in Chemistry at Christ Church. His group have published almost 200 research papers (averaging almost 50 citations per paper) in leading journals. His research interests are broad and primarily focussed on the design and utilisation of functional Interfaces, particularly those associated with molecular recognition and switching. This has included the design and generation of a broad range of responsive nanoparticulate systems, tools whereby supramolecular ion binding can be tracked by capacitance, modulated by local redox switches, surface polarisations or local dielectric. His team have invented new ways of transducing (macro)molecular recognition; open circuit potential methods, shotgun methods, rapid kinetic quantification, magnetic field promoted target capture, and the use of antigen mimick nanoparticles to capture cancer antibodies. Davis is the founder of Osler Diagnostics, a company that has now raised more than £300 million and employs close to 150 people. He was born in London, and lives in rural Oxfordshire with his wife, daughter and direwolves.