THE UNIVERSITY OF SYDNEY

Sydney Analytical
Macromolecular Interactions Analysis

Sydney Analytical has the experience and instrumentation to characterize a wide variety of macromolecular interactions. We can assist to measure interactions between proteins, or with partners including AAV's, nucleic acids, peptides, small molecules or fragments. We can collect data or provide user training on a variety of instrumentation, with experiments best focused to your research needs.

Surface Plasmon Resonance (SPR)

Surface plasmon resonance (SPR) is an optical technique that can be used to measure interactions in real time. Typically, a ligand is immobilized to the surface of an SPR sensor chip, either directly or via an affinity tag. The analyte is then flown over the surface in increasing concentrations.

If an interaction occurs, the change in mass on the sensor surface is detected and plotted as an output sensorgram. Saturating binding curves can then be established for a particular interaction and the affinity constant (KD), along with on- and off-rates determined.

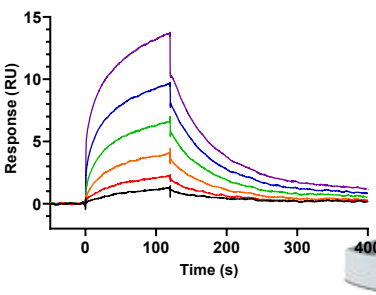
A wide variety of interaction types, such as antibodies and antigens, or any interaction between vaccines, viruses, proteins, cyclic peptides, nucleic acids and/or chemical fragments (small molecules) can all be conveniently explored.

For drug discovery, SPR can be used to screen libraries of compounds for therapeutic leads for diverse diseases as cancer, hypertension and stroke.

SPR chips are also available that allow the assembly of model membranes, allowing protein-, and peptide-membrane interactions to be characterised, and the selectivity and action of potential antimicrobials to be investigated.

The facility has both a Biacore T200 and Biacore 8K+, facilitating both medium and high throughout applications

Measures: Affinity (KD) and kinetics (on & off rates). Range pM - mM



Example Sensorgram

Biacore T200

BiLayer Interferometry

BiLayer interferometry is an optical analytical technique that assesses the interference pattern of white light reflected upon binding of a partner molecule across two surfaces: a layer of immobilized protein on the biosensor tip, and an internal reference layer.

Differences in response are used to determine interaction strength. While not as sensitive as SPR, it uses a smaller sample volume, and has an advantage in measuring interactions in more complex mixtures such as serum

Measures: Affinity (KD) and kinetics (on & off rates). Range nM - mM

Blitz

Isothermal Titration Calorimetry (ITC)

Isothermal Titration Calorimetry (ITC) measures in-solution, the binding affinity between any two molecules that either release or absorb heat when a binding interaction occurs.

The instrument measures the heat difference between a sample cell and a reference cell that occurs upon titration of the binding partner, and uses it to determine affinity, as well as additional parameters.

Measures: Affinity (KD), stoichiometry(n), enthalpy (DH) and entropy (DS). Range: nM - mM

PEAQ MicroCal ITC

To request more information or instrument training, please contact us:

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