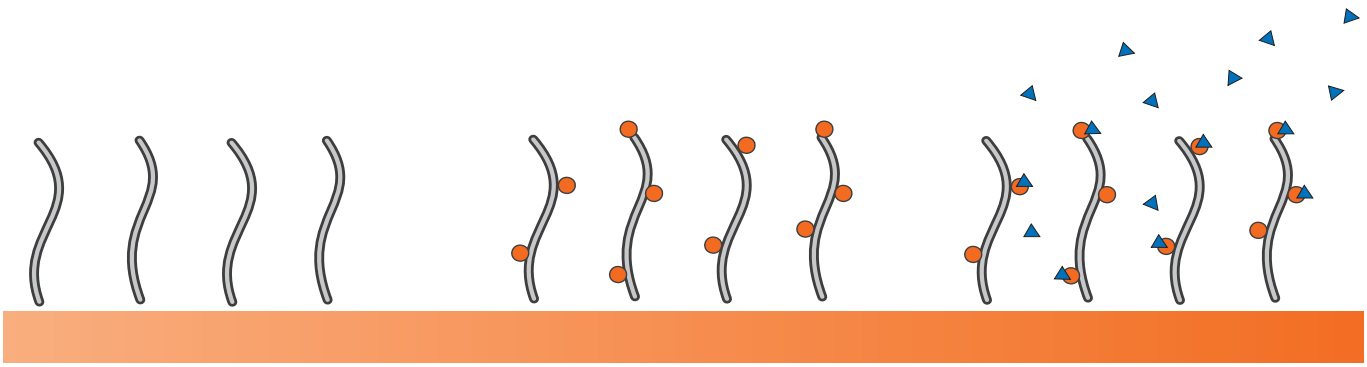
BioNavis

AFFINITY AND KINETICS OF BIOMOLECULAR INTERACTIONS

Measure label-free interactions, whether the molecule is a small molecular weight drug, antibody or protein. Get high quality kinetic data with MP-SPR.



Drug discovery applications of MP-SPR

Measurement of binding affinity and kinetics is crucial not only during the drug discovery of small molecular weight drugs, but also in the development and study of new biopharmaceuticals. Label-free, flow-based measurements are essential for obtaining reliable data.

The compatibility of Multi-Parametric Surface Plasmon Resonance (MP-SPR) instruments with complex samples expands their applicability from drug-receptor and target interactions to include bioprocess monitoring and optimization of drug delivery nanocarriers.

KEY QUESTIONS MP-SPR CAN ANSWER IN BIOMOLECULAR INTERACTIONS:

- What is antibody affinity to antigen Z?
- Which antibody binds best to the target?
- How fast is drug association and dissociation kinetics to molecules X ?
- Which drug molecule is best to bind receptor Y?
- How much peptide binds to the molecule X?
- Which monoclonal antibody has the highest affinity?

WHY CHOOSE MP-SPR FOR MOLECULAR INTERACTION STUDIES?

High sensitivity

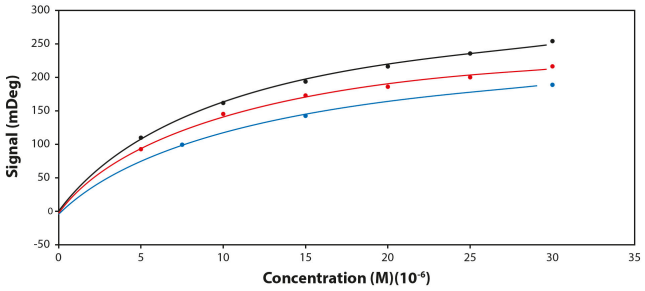
MP-SPR measures not only proteins but also small molecules directly and in meaningful concentrations. MP-SPR is suitable for measurements on small molecular weight drugs, nucleotides, peptides, antibodies, membrane receptors, viruses, nanoparticles, microvesicles, and live cells.

Affinity and kinetic constants

Not only the affinity but also kinetic constants of the interaction are acquired. The data analysis tool offers multiple fitting models, enabling users to select the most appropriate equations for their data analysis needs.

High quality data with PureKinetics™

MP-SPR provides high quality data even in challenging experiments. The key factor is the unique PureKinetics™ feature, which allows compensation of solvent effect (also called “bulk effect”) in real-time. This is essential when interaction with membrane extracts is measured, or assay is performed in crude samples, such as 100% serum. MP-SPR is the only technology capable of measuring PureKinetics™ interactions because complete MP-SPR curve measurement is required.

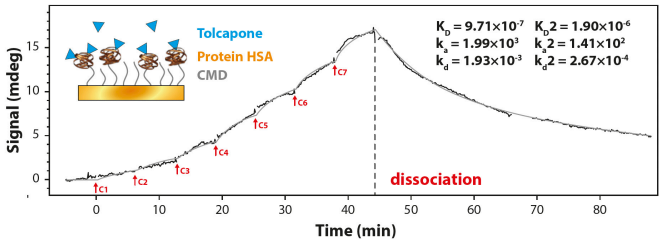


Adalimumab affinity	CD16b K_D(µM)
1. Purified sample injection	10.90
2. Crude sample injection (including cells)	13.10
3. Purified sample injection (measured after crude sample injection)	10.20

Biopharmaceutical antibody drug binding affinity measured in cell culture crude samples.

KineticTitration – faster interaction measurement

KineticTitration significantly reduces time required to run an assay with different concentrations. It is also useful for interactions that are difficult to regenerate or when regeneration damages the ligand on the surface. In the measurement, analyte samples are flown over the surface in a series from low to high concentration. Unlike other methods, this process does not require dissociation and regeneration steps between samples of different concentrations. Available in fully automated 4-channel 410A KAURIS and 420A ILVES instruments.



Small molecular weight drug affinity and kinetics to protein. Application Note #155

Interactions with membranes and live cells

MP-SPR allows you to transfer from drug - target interactions to drug - lipid membrane, and drug - live cell interactions. For more information see BioNavis leaflets on live cell measurement and biophysics.

Sensor slide selection

MP-SPR can be equipped with a wide range of unique surfaces. For biomolecular interaction assays not only CMD, Protein A/G and NTA sensors are utilized, but also BND (BioNavis dextran like sensor), Regenerable Avidin kit and SiO_2 sensors are readily available. The wide sensor selection enables the utilization of various chemistries.

User friendly instrumentation

MP-SPR instrument range provide solution for every need, whether you need a modular entry level instrument or a fully automated system with 96-/384- well plate for unattended runs. All MP-SPR instruments are equipped with elastomer coated prism for easy and fast sensor slide insertion enabling simple workflow.

We provide full care packages, including assay development support, to start your measurements quickly. You have the option to acquire instruments with an Annual Maintenance Contract (AMC) or you can also choose to change the flow cell and tubings yourself.

Further reading

AN#170 Profiling of G protein-coupled receptor (GPCR) stimulation by small compounds in live cells

AN#169 Diagnostic method for serological testing of COVID-19 antibodies

AN#166 Antibody – antigen interaction using Regenerable avidin kit

AN#155 Faster Interaction Measurements using MP-SPR KineticTitration

AN#144 Small molecular weight drug binding to protein

Selected publications

Small drug prevents amyloid beta aggregation - Alzheimer´s study
(Hilt *et al.*, Journal of Physical Chemistry C , 2017)

Kinetics of PKCe Activating and Inhibiting Llama Single Chain Antibodies
(Summanen *et al.*, PLoS One, 2012)

Interaction of indomethacin nanocrystals and PEO/PPO copolymer stabilizers
(Liu *et al.*, Pharmaceutical Research, 2015)

Small molecule drug interaction on supported lipid bilayer
(Parkkila and Viitala, ACS Chemical Neuroscience, 2020)

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