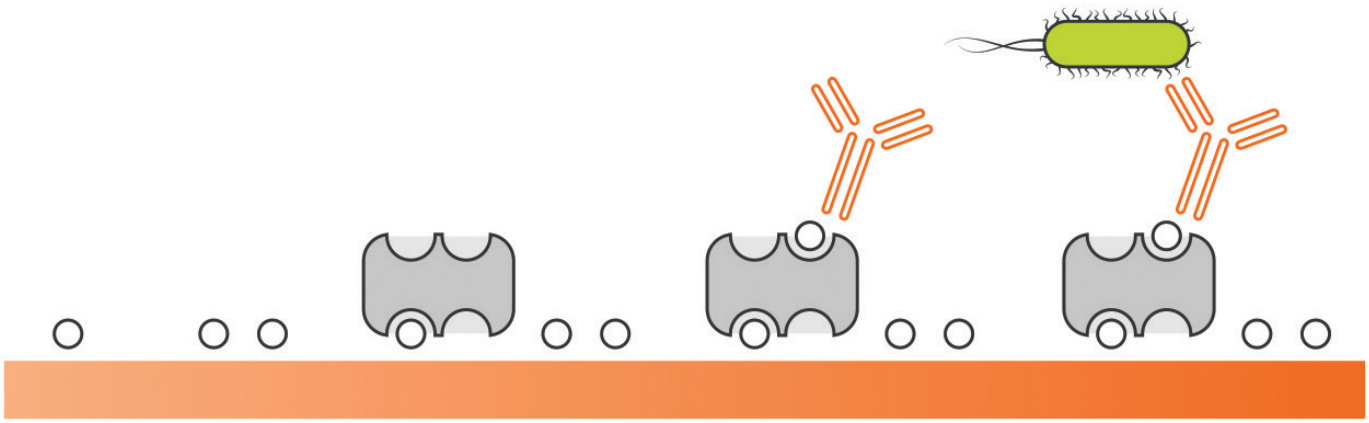
BioNavis

ALL THE STEPS OF YOUR ASSAY ON THE SURFACE OF YOUR OWN CHOICE!

Measure molecules binding in real-time and label-free



Biosensor applications of MP-SPR

Multi-parametric surface plasmon resonance (MP-SPR) is an essential tool for assay development in fields such as food and feed safety, environmental safety, clinical diagnostics, border control and process control. While part of the research worldwide is dedicated to high-throughput instruments, more and more attention is gained by portable or point-of-care instruments.

MP-SPR is an excellent tool for development of portable biosensors. Point-of-care biosensors typically include electochemical sensors, surface enhanced Raman sensors (SERS), ELISA, fluorescence or newly also printed diagnostics.

KEY QUESTIONS MP-SPR CAN ANSWER IN BIOSENSOR DEVELOPMENT:

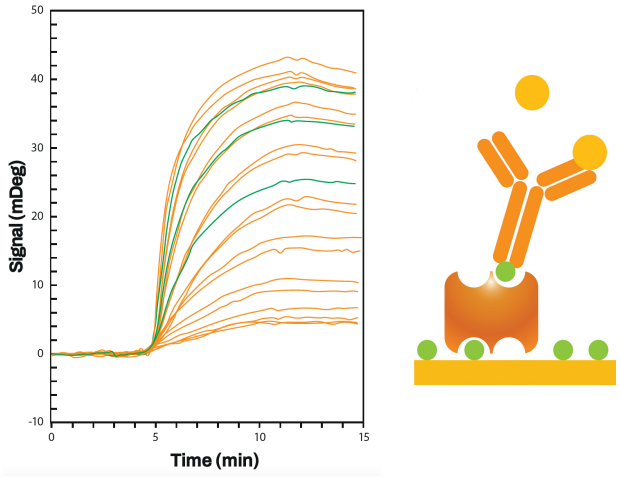
- How fast does the molecule X bind with the surface A as compared to surface B?
- What is the optimum surface for my biosensor application?
- How does my assay work with crude samples, such as serum, saliva, sea water or urine?
- Which coating prevents sample adsorption onto my microfluidic chanels?
- Is the biosensor that I have designed working better than the previous?

WHY CHOOSE MP-SPR FOR BIOSENSORS?

Any assay type

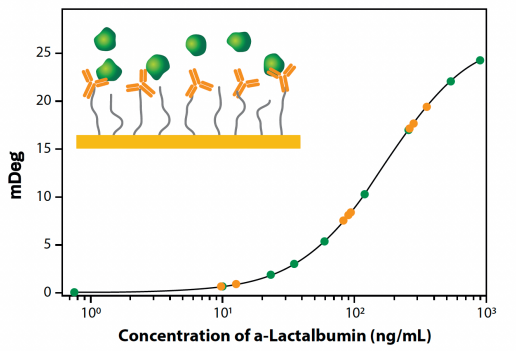
MP-SPR monitors every step of your assay, whether it is binding or competitive assays, it uses antibodies, fragments, DNA, molecularly imprinted polymers (MIPs), aptamers, nanoparticles, cells or microvesicles. Measure **affinity** and **kinetics** of molecular interactions in high sensitivity without labels and determine **bound mass**. MP-SPR is the only technique in the market that is able to quantify also conformational changes using complete SPR curve measurment, LayerSolver™, and measurements at multiple wavelengths.

IgG detection from serum samples



Any sample

MP-SPR works with **gas**, vapor or **liquid** samples. The samples can be purified or crude, including saliva and whole serum. The sample can contain even metallic nanoparticles and still be measured by MP-SPR. MP-SPR is also compatible with certain **organic solvents**.



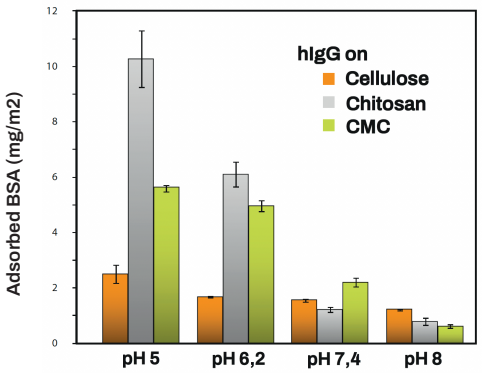
Ex-situ modification of MP-SPR sensor surfaces

Develop your sensor direcly on your sensing material: metals for electrochemical (EC) and SPR detection, plastics for ELISA, cellulose for printed biosensors, metal nanoparticles for SERS, glass for classical chemisrty, magnetic nanoparticles, bacteria, living cells, and more.

MP-SPR instruments do not require refractive index matching oil and thanks to a fast locking sensor slide holder, sensor slide handling is very easy. Sensors can be functionalized *in-situ* or *ex-situ* with a number of methods including spin coating, dip coating, Langmuir-Blodgett, ALD, sputtering, CVD, etc.

Our sensors can be often re-used. Our gold sensors use a superior adhesion layer that allows for repeated cleaning with strong acids. We provide many other sensor surfaces including SiO_2, TiO_2, Pt, but also functionalized surfaces, such as unique regenerable avidin kit for biotinylated ligands, carboxymethyl dextrans, His-Tag and more.

Adsorption on *ex-situ* modified surfaces



Easy validation

In-situ validation is possible with **electrochemistry, fluorescence** and other optical detection methods. *Ex-situ* validation is possible with microscopy, including AFM and SEM.

Microfluidistics

New biosensors often utilize microfluidics to minimize sample consumption and to reduce the analysis time. Microfluidic chips can be made in polymers, silica, metals, glass or even paper. It is essential to coat the microchannels in order to prevent sample adsorption onto the channel surface instead, and thus to avoid the reduction of analyte concentration in the sample.
MP-SPR can be used to study microfluidic surfaces properties, such as wetting and antifouling.

Further reading

AN#169 Serological testing of Covid-19 antibodies

AN#168 Regenerable avidin kit: Biomolecule affinity and concentration studes

AN#165 Cellulose fiber-based yarn of capturing estrogen residues from aqueous matrices

AN#162 Concentration analysis from milk

AN#160 Bacteria detection from powdered milk using enzymatic precipitation

AN#154 Cancer cell detection

AN#140 Gold nanoparticles for biosensing

Selected publications

An impedimetric study of DNA hybridization on paper-supported inkjet-printed gold electrodes (Ihalainen *et al.*, Nanotechnology 2019)

Rapid and sensitive detection of maize chlorotic mottle virus (Zeng *et al.*, Analytical Biochemistry, 2013)

Salmonella detection from powdered milk (Farka *et al.*, Analytical Chemistry, 2016)

Listeria detection with aptamers (Tasbasi *et al.*, Analytical Biochemistry, 2019)

Enchanted biosensing: IgG detection from CHO culture (Islam *et al.*, Bioconjugate Chemistry, 2019)