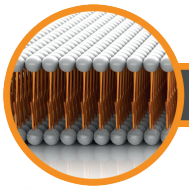
Excellence in Surface Plasmon Resonance

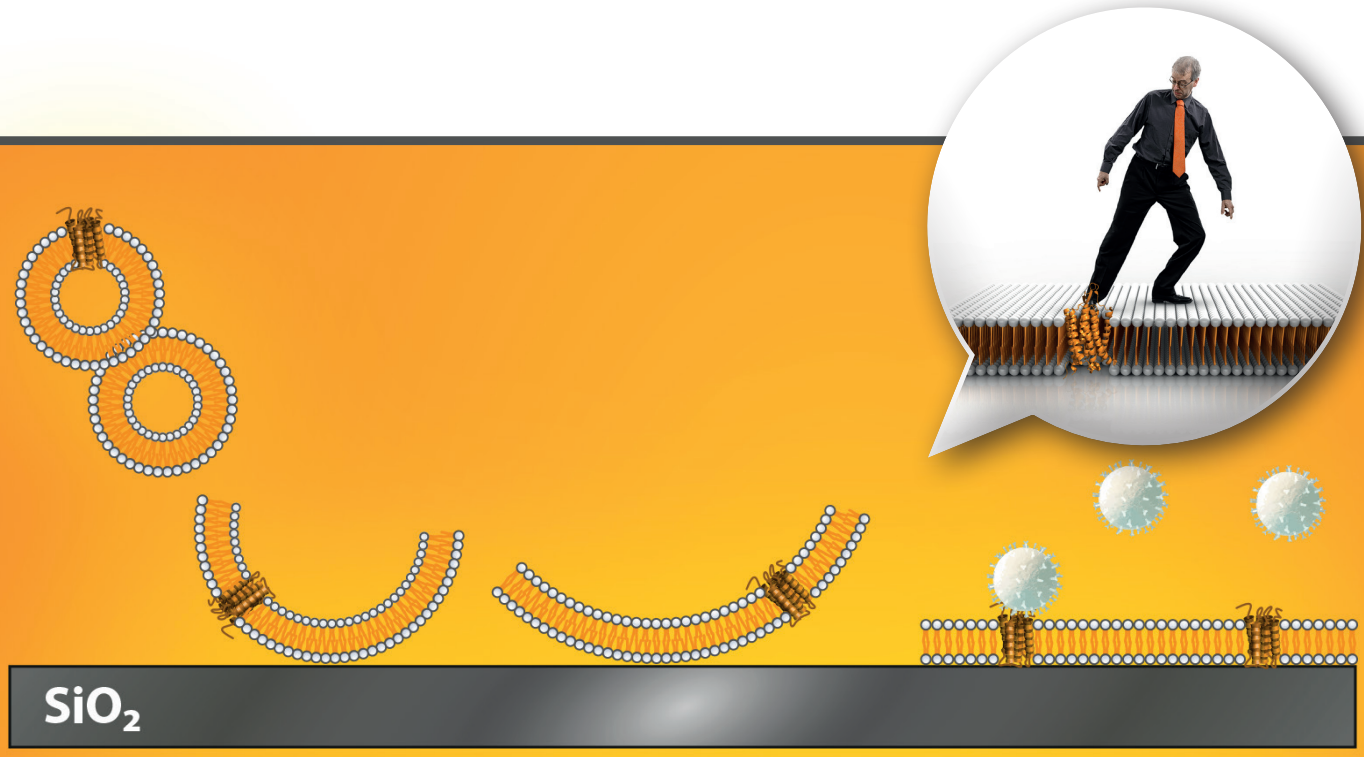
BioNavis



Biophysics

Interactions, affinity and kinetics on reliable lipid surfaces

See lipid layer formation in real-time and label-free!

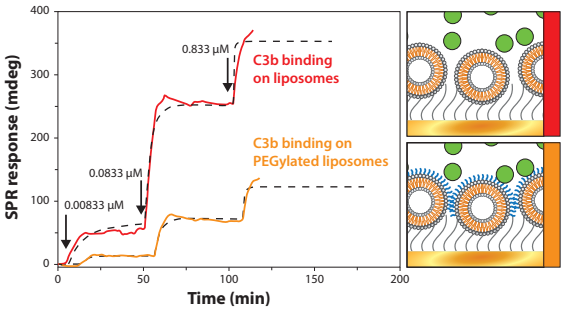


Key questions MP-SPR can answer in biophysics research:

- What is the kinetics of supported lipid bilayer formation?
- How does nanoparticle X interact with a biomembrane?
- How does a membrane protein (such as GPCR) interact with a drug?
- What is the quality (thickness and optical density) of the biomembrane?
- How stable is a membrane system in air?
- What conformation does a lipid form take on after deposition?

www.bionavis.com/biophysics

Why choose MP-SPR for biophysics?



Binding affinity and kinetics

After you have confirmed the desired conformation of the membrane, measure binding affinity, kinetics and bound mass on target molecule or membrane. Interaction measurement are label-free and can be performed even in crude samples such as 100%.

No artifacts from lipid swelling

Label-free measurements of lipids are typically hindered by artifacts from swelling (traditional SPR) or high liquid content (QCM) when measuring lipids in water based liquids. Uniquely, MP-SPR allows the measurement of environmental factors using the PureKinetics™ feature and thus provides high-quality data.

Easy lipid membrane formation

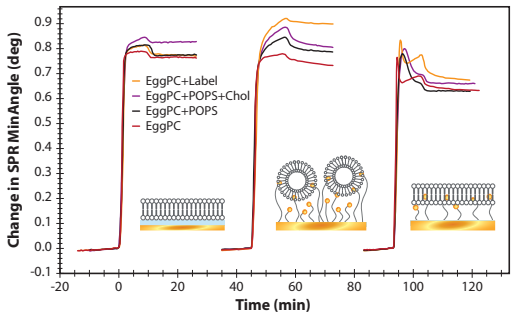
Since our MP-SPR instruments use an advanced elastomeric coating on the prism, we can work with simple coated glass slides as measurement substrates. This allows the substrates to be modified *ex-situ*. The extended scanning angular range also allows for a variety of substrate coatings. This in turns allows versatile methods to be used for deposition of phospolipid membranes for MP-SPR studies. The most typical ones are liposomes on hydrogels and supported lipid bilayers on SiO_2.

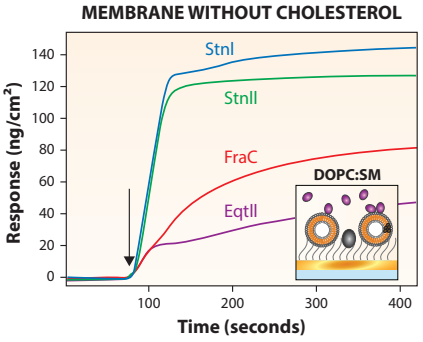
Our gold sensors can be re-used even after work with lipids thanks to a special adhesion layer. Typical cleaning protocols are provided to our users in our user intranet.

Membrane quality

Before injecting any valuable samples, the quality of the lipid deposition can be checked and quantified. MP-SPR with LayerSolver™ software and measurements with two wavelengths enable true thickness and optical density measurement. This provides invaluable information about the quality of the lipid membrane and its conformation.

In fact, thickness and refractive index of the layer can be measured at the same time with the interaction kinetics. This in turn can show for instance lipid rupture or swelling of layers in real-time.

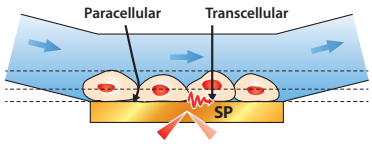




From membranes to living cells

To maintain their functionality, some of the membrane proteins require also presence of other cellular structures. Also, certain membrane proteins are difficult to keep in functional form after retrieval from the cell. Therefore there is a need to move to label-free measurements on whole cells.

MP-SPR is currently the only platform that allows label-free separation of permeation of molecules across cell layer from internalization of drugs and nanoparticles by cells.



Recommended MP-SPR Navi™ instrument for measurements of lipids:

200 OTSO **400 KONTIO** **210A VASA** **220A NAALI** **420A ILVES**

Further reading:

AN#157	Toxins interaction with lipid membranes
AN#156	Extracellular vesicles and other nanoparticles uptake by living cells
AN#154	Cells binding on hydroxyapatite and peptide surface
AN#152	Protein binding on liposomes
AN#151	Corona formation on liposome in 100% serum
AN#139	Self-assembly of lipid bilayer from liposomes
AN#137	Drug interaction with living cell monolayer

Selected publications:

Targeting tumor-associated exosomes with peptides
(Carney et al., Advanced Biosystems, 2017)

Pore formation in complex bilayer membranes
(Garcia-Linares et al., Biochemistry, 2016)

Real-time monitoring of nanoparticle uptake by living cells
(Suutari et al., Small, 2016)

Proteins and 100% serum interaction with liposomes
(Kari et al., Drug Delivery and Translational Research, 2016)

Size and concentration of extracellular vesicles
(Rupert et al., Analytical Chemistry, 2016)

Morphology of Lipid Layers (Granqvist et al., Langmuir, 2014)

Vesicular and non-vesicular transport feed distinct glycosylation pathways in the Golgi (Angelo et al., Nature, 2013)

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