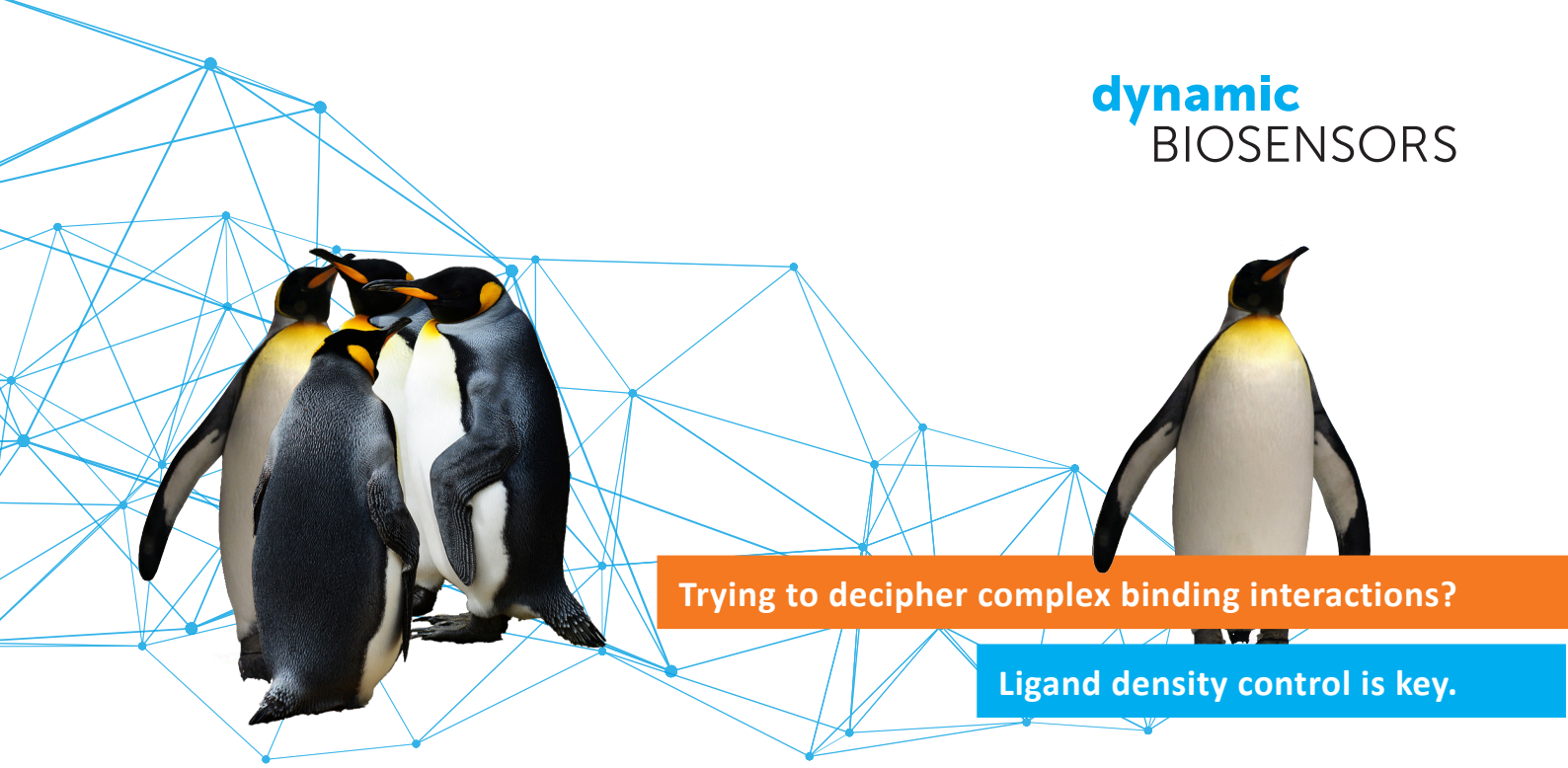
dynamic
BIOSENSORS



Trying to decipher complex binding interactions?

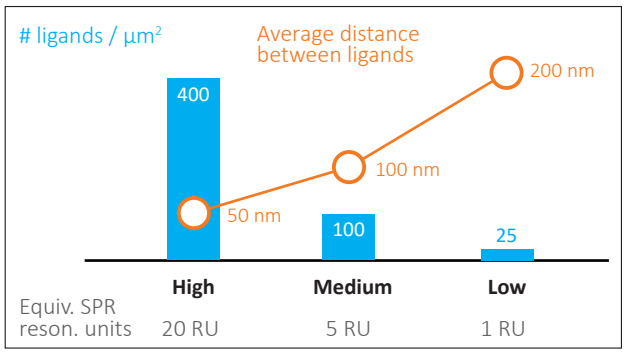
Ligand density control is key.

The **switch**SENSE® MP3 multi-purpose chip with 3 nanolever densities. Ligand density control made easy.

Controlling the density of ligand molecules on biosensor surfaces is crucial for experimental success:
For multi-valent binders such as antibodies, tuning the ligand density promotes or suppresses the valency of analyte binding and shifts target engagement between **affinity** and **avidity** driven interaction modes.
For monovalent interactions, controlling ligand densities is essential, too. Kinetics measurements can be complicated by experimental limitations regarding analyte mass transport, rebinding effects, or steric hindrance. Controlling the ligand surface density serves not only to identify these potential artefacts, but also to minimize them.

The **switch**SENSE® multi-purpose chip MP3 with its three predefined ligand surface densities makes it easy to experiment with different and **ultra-low densities**, and ensures quick experimental success even for challenging interactants.

- Ready-to-use biosensors prepared with 3 different nanolever (ligand) densities.
- Compatible with **Invisibility Cloaking** and **Electrical Desorption** for the user-controlled adjustment of ligand densities.
- Fluorescence-based **switch**SENSE® technology for reliable analyte binding detection. Compatible with dynamic and static measurement modes.
- 2D surface attachment (no matrix effects).
- Sequences are compatible with standard **switch**SENSE® Multi-Purpose-Chips (MPC).



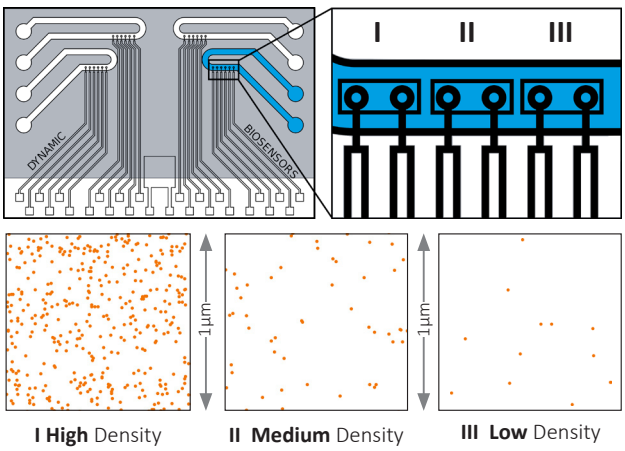
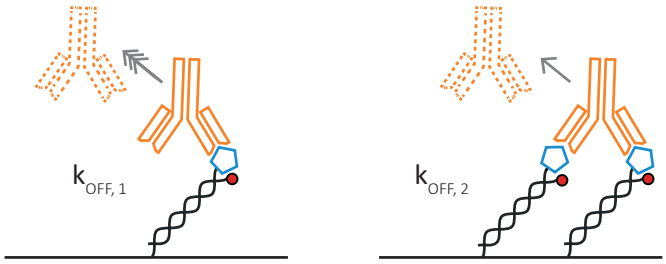


Figure: Biosensors carry 3 pre-adjusted nanolever densities in duplicates, distributed over 6 electrodes in each flow channel. Every chip features 4 flow channels, i.e. 4 channels x 3 densities.

The switchSENSE® MP3 chip provides control over the interlinking of ligands by multivalent analytes

Necessity for surface density variation in complex binding situations

Antibodies bound via one antigen-binding site (paratope) feature fast dissociation rates ($k_{OFF,1}$), while antibodies bound via two paratopes feature slow dissociation rates ($k_{OFF,2}$).



Standard surface density – bivalent binding

On a standard surface density the same antibody will bind to the surface via its two paratopes and will display a bivalent binding (avidity).

Low surface density – monovalent binding

On a low surface density functionalized with an antigen, an antibody for which the inter-paratopic distance is approximately 15 nm cannot reach two ligands simultaneously and will bind monovalently to the surface (affinity).

The switchSENSE® MP3 density chip can be ideally combined with the biphasic interaction analysis tool of the switchANALYSIS software to unravel affinity and avidity in a single measurement.

switchSENSE® Instruments

Automated liquid handling and dilution series platform for 96-well plates and vials. Full walk-away operation for overnight measurement and multiple regenerations.
Reusable biochips. Temperature-controlled environment.
Dual-color technology for the simultaneous detection of two interactions on the same surface.

Limit of detection	10 fM
Dissociation constant	50 fM- 1 mM
Association rate constant	10^3- 10^8 $M^{-1}s^{-1}$
Dissociation rate constant	10^{-6}- 1 s^{-1}
Hydrodynamic diameter accuracy	0.1 nm
Temperature	8°- 75°C (chip) / 10°- 40°C (autosampler)

DRX & DRX²

smart biophysical analysis

Contact info@dynamic-biosensors.com to speak to our application team about methodologies or to arrange a demonstration.

switchSENSE® is a proprietary measurement technology by Dynamic Biosensors GmbH. Instruments and biochips are engineered and manufactured in Germany.

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