Product Information

QSense® QSX 339 Biotin Functionalized

Label-free measurement of biomolecular interactions can be conveniently performed by immobilizing one of the interacting species onto the surface of a sensor. The QSense Biotin Functionalized Sensor, QSX enables immobilization via the commonly used high affinity interaction between biotin and streptavidin [1-4]. The affinity between biotin and streptavidin is the highest of any known biological ligand pair, K_a=2.3x10^{13} M^{-1}.

Each sensor is individually packed to minimize light exposure that would otherwise degrade the biotin functionality. The QSense Biotin Functionalized Sensor can be used with your streptavidin or avidin analogue of choice (please note that these proteins are not provided by Biolin Scientific).

The QSense sensors are developed and produced to provide you with stable, reliable and reproducible data. Full performance is ensured through extensive quality controls and guaranteed for one-time use according to the recommendations.

Sensor specifications	
Description	Biotin functionalized sensor
Surface chemistry	Short stranded poly ethylene glycol (PEG) thiols creating mixed self assembled monolayers exposing biotin groups.
Sensor surface base	Au
Binding	-22 ± 3 Hz (a monolayer) of streptavidin in a robust manner for incorporation of different biotinylated proteins.
Specificity	No non-specific binding detected when incubated in fetal bovine serum with protein concentration ~ 40 mg/ml for 30 min.
Usage	The sensors should be mounted into the instrument directly from the box without prior cleaning since this can affect the adsorbed thiol monolayer. It is sufficient to rinse with water/buffer in situ before measuring.
Storage	Store away from light at low temperatures (2-8 °C). Note that thiols have a tendency to oxidise when exposed to light and excess air.
Shelf Life	Stable for at least 8 weeks (90% retained streptavidin binding activity).

Specifications may be subject to change without notice.

1 - Edvardsson, M., et al., QCM-D and Reflectometry Instrument: Applications to Supported Lipid Structures and Their Biomolecular Interactions. Analytical Chemistry, 2009. 81(1): p. 349-361.

2 - Glasmastar, K., et al., Protein adsorption on supported phospholipid bilayers. Journal of Colloid and Interface Science, 2002. 246(1): p. 40-47.

3 - Hook, F., et al., Characterization of PNA and DNA immobilization and subsequent hybridization with DNA using acoustic-shear-wave attenuation measurements. Langmuir, 2001. 17(26): p. 8305-8312.

4 - Larsson, C., M. Rodahl, and F. Hook, Characterization of DNA immobilization and subsequent hybridization on a 2D arrangement of streptavidin on a biotin-modified lipid bilayer supported on SiO_2. Analytical Chemistry, 2003. 75(19): p. 5080-5087.

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Biotin binding sites

Streptavidin has four binding sites for Biotin and thus acts as a linker between the biotinylated sensor surface and a biotinylated analyte. In Figure 1 an example is shown where biotinylated protein-A has been immobilized that specifically binds to immunoglobulin (Ig) antibodies. This enables studies of an antibody-antigen interaction, as seen in Figure 1.

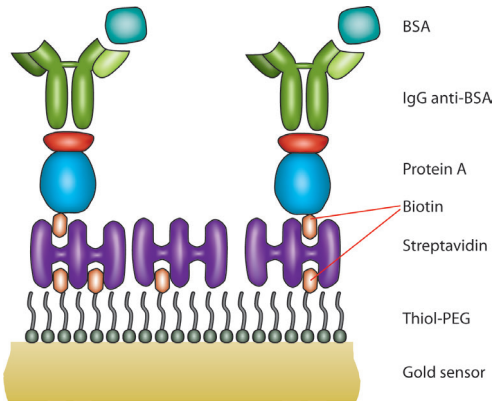

Figure 1. Example of suitable layer build-up for antigen-antibody interaction studies.

Verification of retained activity

To prove that the QSense Biotin Functionalized Sensor was still active after 8 weeks of storage, immobilization of streptavidin and the subsequent binding of biotinylated Bovine Serum Albumin (biotin-BSA) were performed. The level of binding of these proteins, which corresponds to the level of binding activity of QSX 339, was measured with QCM-D. These sensors were stored dark and at low temperatures (fridge) and retained up to 90 % of the binding activity after 4 and 8 weeks. Also, the associated dissipation shifts have the same characteristics as at starting point.

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