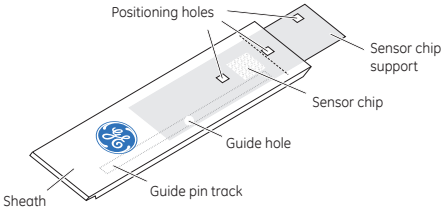
GE Healthcare
Life Sciences

Instruction 22-0564-88 AD **Biacore™**

Sensor Chip SA

Product description

Order code:	BR-1000-32 (Package of three sensor chips)
	BR-1003-98 (Package of one sensor chip)
Storage:	The use-before date applies to chips stored at +2 to 8°C in unopened pouches.
Limitations of use:	Use of Sensor Chip SA as recommended in Biacore 3000 and Biacore 2000 requires that Method Definition Language (MDL) is used. The recommended extra wash is not possible using the software wizards



Note: *For in vitro use only.*

The sensor chip is fixed to a polystyrene support sheath. Each cassette, consisting of a sensor chip and sheath assembly, is individually packed under a nitrogen atmosphere in a sealed pouch.

Application areas

Sensor Chip SA is designed to bind biotinylated molecules for interaction analysis in Biacore systems. The surface consists of a carboxymethylated dextran matrix pre-immobilized with streptavidin and ready for fast, high-affinity capture of biotinylated ligands such as peptides, proteins and nucleic acids. Sensor Chip SA provides a convenient alternative to covalent coupling for ligands that are difficult to immobilize directly or do not withstand covalent immobilization. Controlled biotinylation enables orientated capture.

Refer to www.gelifesciences.com/biacore for updates on applications and scientific publications.

Preparation of biotinylated ligand

Ligands may be biotinylated using a range of methods and reagents. In general, aim for a measured biotinylation level of 1 biotin residue per ligand molecule.

Recommendations for biotinylation procedures may be obtained from GE Healthcare (www.gelifesciences.com/biacore).

Preparations for use

1 Allow the sealed sensor chip pouch to equilibrate at room temperature for 15 to 30 minutes in order to prevent condensation on the chip surface.

2 Prepare the Biacore instrument with running buffer. The buffer should be filtered (0.22 µm), and degassed for systems that do not have an integrated buffer degasser.

3 Open the sensor chip pouch. Make sure that the sensor chip support remains fully inserted into the sheath at all times.

4 Dock the sensor chip in the instrument as described in the instrument handbook. Sensor chips that are not docked in the instrument should be stored in closed containers.

Immobilizing the ligand

General recommendations

Biotinylated ligand is immobilized on Sensor Chip SA by non-covalent capture (binding to streptavidin). In systems with serial flow cells, it is important to avoid carry-over of biotinylated ligand from one immobilization to the other flow cells. Follow the guidelines below to minimize the risk for carry-over.

- Clean the instrument with ***Desorb*** before docking the sensor chip, particularly after experiments using other biotinylated molecules.
- If possible, include detergent in the running buffer used for immobilization. HBS-EP+ or HBS-EP (available from GE Healthcare) are recommended as running buffer.
- Condition the sensor surface with three consecutive 1-minute injections of 1 M NaCl in 50 mM NaOH before ligand is immobilized.
- Include an extra wash (see *Appendix: extra wash, on page 6*) using 50% isopropanol in 1 M NaCl and 50 mM NaOH after each ligand injection. This solution does not pass over the sensor surface. Prepare the wash solution by mixing equal volumes of isopropanol and 2 M NaCl in 100 mM NaOH, and use within a week.

Immobilization

Inject the biotinylated ligand. Ligand concentrations may be as low as in the pM range. Ligands usually bind rapidly to the streptavidin and equilibrium binding is achieved with short contact times, typically 1 minute. To control the immobilization level for ligands requiring short contact times, adjust the ligand concentration. Use a low flow rate to reduce consumption of ligand.

For PCR products, include NaCl at a concentration of 0.5 M or higher in the ligand buffer and use longer contact times, typically up to 30 minutes.

Note: *Injection of blocking reagent in systems with serial flow cells is <u>not</u> recommended, since the blocking reagent may carry over to adjacent flow cells and reduce the ligand immobilization capacity.*

For more detailed information on immobilization strategies and procedures, refer to Biacore Sensor Surface Handbook.

Interaction analysis

Interaction analysis is performed by injection of samples over the sensor chip surface. Analyte molecules in the injected sample bind directly to the captured ligand.

Refer to Biacore handbooks and www.gelifesciences.com/biacore for details on experimental protocols and methodology.

Regeneration

Regenerate the surface by removing the analyte from the captured ligand. Conditions should be chosen to achieve complete dissociation of the analyte without affecting the binding characteristics of the ligand. The choice of regeneration procedure may be limited by the stability of the ligand.

Avoid using basic regeneration solution if possible. In some cases, exposure to basic conditions has been seen to cause leaching of the biotinylated ligand from the sensor surface with contamination of downstream flow cells as a result.

For more detailed information on regeneration strategies, refer to Biacore Sensor Surface Handbook.

Chemical resistance

The surface of Sensor Chip SA is resistant to 1-minute pulses of many commonly used agents. See table below for information of common agents compatible with Sensor Chip SA.

Agent	Concentration
Acetonitrile	30%
DMSO	10%
DTE	0.1 M
EDTA	0.35 M
Ethanol	70%
Ethanolamine	1 M
Ethylene glycol	100%
Formamide	40%
Formic acid	20%
Glycine pH 1.5 to 3.0	100 mM
HCl	100 mM
Imidazole	300 mM
$MgCl_2$	4 M
NaOH	100 mM
NaCl	5 M
SDS	0.5%
Surfactant P20	5%
Urea	8 M

Appendix: extra wash

Follow the instructions below to to add and run the extra wash.

In Biacore X100:

- Use the ***Extra wash*** command.

In Biacore 3000 and Biacore 2000:

- Download the Method Definition Language (MDL) method "*Biacore 3000 Conditioning - Immobilization With Wash - Sasurface v1-blm*" from www.biacore.com/applicationsupporttools - Methods, or
- create a MDL method that includes the following steps:

Step	Description
Surface conditioning	Three consecutive injections of 1 M NaCl in 50 mM NaOH. Flow rate 10 µl/min and contact time 1 minute are recommended.
Immobilization of the biotinylated ligand	Concentrations as low as in the pM range may be used. Ligands usually bind rapidly to the streptavidin and equilibrium binding is achieved with short contact times, typically 1 minute. Flow rate 10 µl/min or higher is recommended.
Additional wash	Wash with a solution of 50% isopropanol in 50 mm NaOH and 1 M NaCl after ligand injection. This solution does not pass over the surface. Enter the wash commands in the following order: - ***WASHPOS n*** (needle will be washed with wash solution from a defined position). - ***WASHPOS s*** (sample loop will be washed with wash solution from a defined position). - ***WASH n*** (needle will be washed with running buffer). - ***WASH s*** (sample loop will be washed with running buffer).

Note: *Conveniently, the wash solution may be prepared as a stock solution of 100 mM NaOH and 2 M NaCl. The solution can be stored at 20°C for a month and mixed 1:1 with isopropanol when the wash solution is needed. The wash solution (50% isopropanol in 50 mM NaOH and 1 M NaCl) can be stored at 20°C and should be used within a week.*

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