

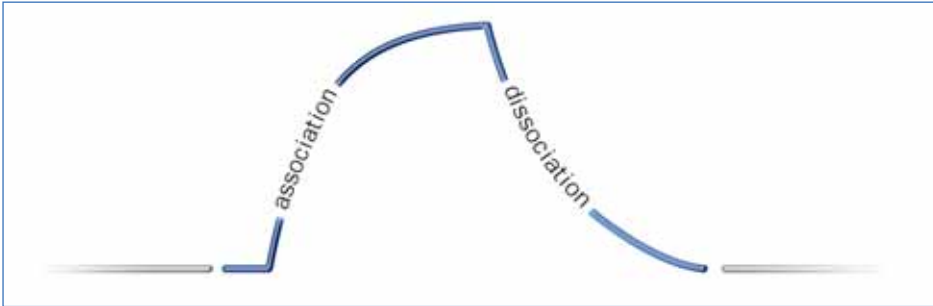
Biacore T100

Unmatched performance for
label-free interaction analysis



Base your decisions on the best

Information-rich interaction analysis



Label-free interaction analysis produces a plot of binding response against time (the sensorgram) over the entire course of association and dissociation. No other technique provides such comprehensive information in real-time from one system.

Drawing the right conclusion at the right time is crucial to success, from basic research through drug discovery and development to manufacturing QC.

For more than 15 years Biacore™ systems have provided exceptional insights and superior quality, information-rich data on molecular interactions, defined in terms of specificity, association and dissociation rates, and affinity.

Biacore systems set the benchmark for label-free interaction analysis.

Biacore T100 offers unmatched performance for comprehensive characterization of molecular interactions:

- Elucidate disease mechanisms
- Define potential drug targets
- Select the best antibodies
- Detect and characterize immune responses
- Select and characterize protein therapeutics
- Characterize protein-LMW interactions

Facts

Biacore systems are cited in over 4500 peer-reviewed scientific publications and are used extensively in academic research institutes and universities worldwide. They are also used by the world's leading pharmaceutical and biotechnology companies.

Make critical decisions with confidence

From research through drug discovery and development to QC

Biacore systems to suit your needs



Biacore A100 -
Unmatched productivity



Biacore Flexchip -
Array-based comparative profiling



Biacore X100 -
Ready to run research system



Biacore T100 -
Unmatched performance

Biacore T100 - highest quality data in real time

Unmatched performance from research to QC

Biacore T100 at work

Make critical decisions with confidence – from basic research through drug discovery and development to manufacturing and QC.

In addition to providing measurements of specificity, affinity and kinetics, Biacore T100 adds yet another dimension to interaction analysis with information about the thermodynamic properties underlying association and dissociation rates.

- Elucidate disease mechanisms by characterizing native or recombinant protein interactions
- Select the best antibodies as research tools, assay components or therapeutics by fully defining their interaction behavior
- Define potential drug targets and diagnostic markers
- Characterize protein: LMW compound interactions in drug discovery
- Select protein therapeutic candidates according to their on/off rates
- Detect and characterize immune responses during preclinical and clinical development
- Characterize protein therapeutics and implement QC methods

Productive research and development

Biacore T100 offers a versatile, multi-application solution that sets the performance standard for interaction analysis. Software wizards assist with the evaluation of every interaction parameter, making the system very straightforward to use. Applications, such as antibody characterization, which could take weeks by conventional methods, can be completed in days.

Regulatory compliance

An optional GxP support package saves significant time during validation procedures. Biacore T100 has been specifically designed with a high level of in-built GLP/GMP/GCP support for 21 CFR Part 11 compliance.





High performance, versatility and ease of use with Biacore T100.

Choose the right antibody

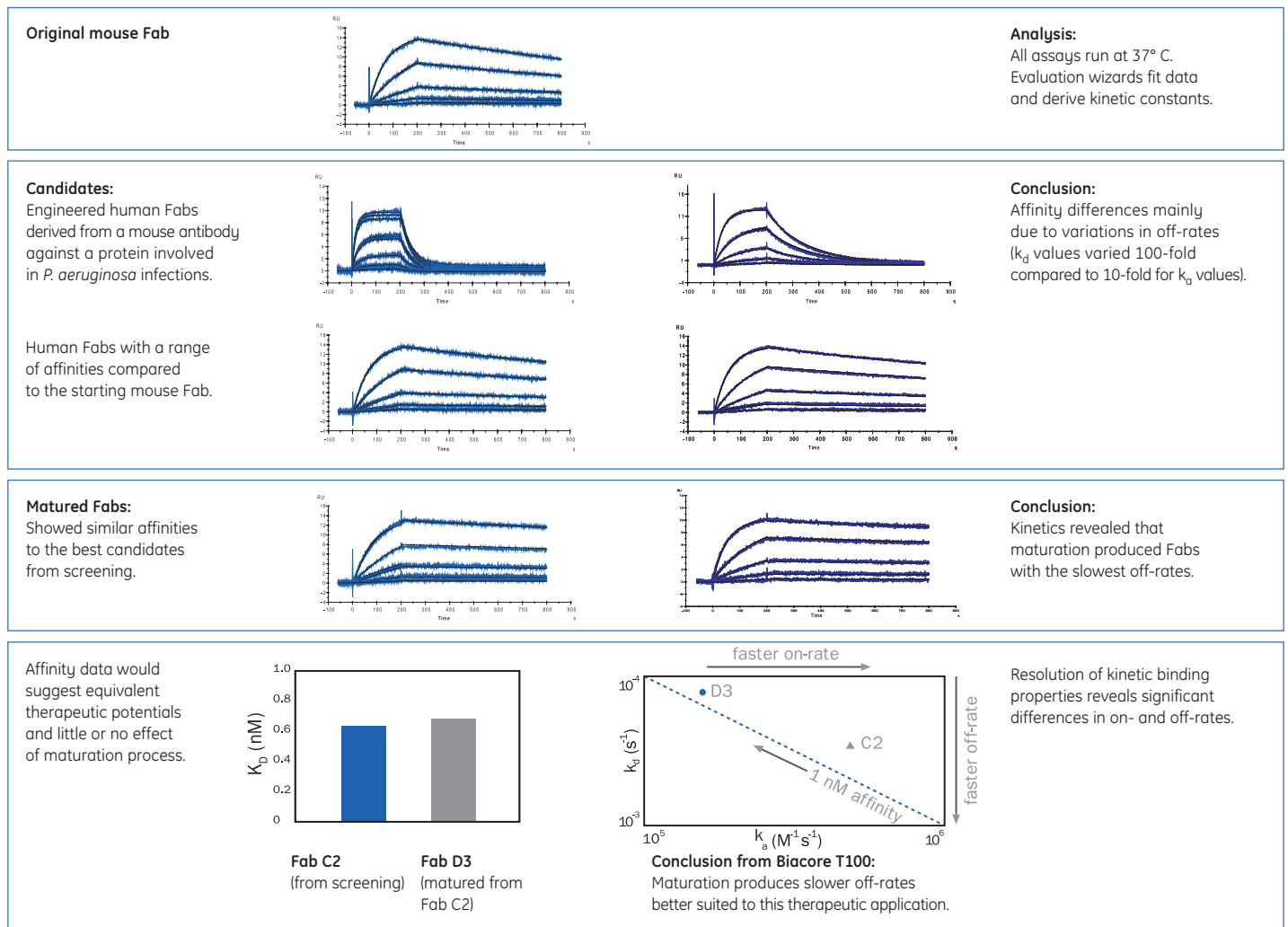
Make well-informed selections based on high-resolution characterization

Antibodies and other proteins can be fully characterized within days.

In basic and applied research, clearly defining interaction characteristics ensures that the best antibodies are selected as research tools or therapeutic candidates.

- Confident selection of therapeutic candidates
- Better-informed assessment of the development process
- Robust analysis at 37° C for more physiologically relevant predictive value
- Excellent correlation between off-rates and cell assay (results not shown)

Selection of therapeutic candidates based on high-resolution kinetic analysis at physiological temperature



Comprehensive characterization of immune responses

Reliable, information-rich assays for confident definition of serum antibody properties

Comprehensive characterization of immune responses is essential in immunotherapeutic and vaccine development, as well as in clinical immunogenicity studies.

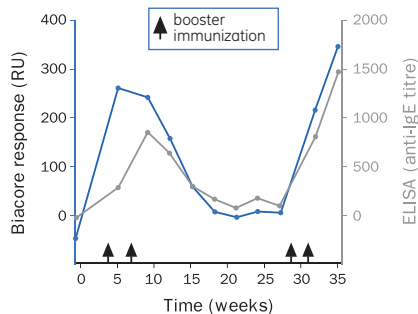
In this application, Biacore T100 offers a new approach for optimization of immunization regimens in immunotherapeutic development:

- Qualitative assessment of antibody binding stability over the immunization period
- Immune responses in relation to time, adjuvant and dosing regimes
- IgG subclass determination (data not shown)
- Data consistent with ELISA but with much higher reproducibility and information content

Characterizing immune responses in the development of immunization regimes for an immunotherapeutic protein

Immunotherapeutic: Recombinant IgE-derived protein designed to provoke an immune response against IgE, providing a novel therapy for allergy and asthma.

Experimental: Anti-IgE immune responses monitored over time in one primate using Biacore T100 and ELISA.



Response pattern: Peaks and declines after first two boosters and increases strongly again following 3rd and 4th boosters.

Comparison with ELISA: Anti-IgE response patterns correlated well for individual animals (earlier responses seen with Biacore in some cases).

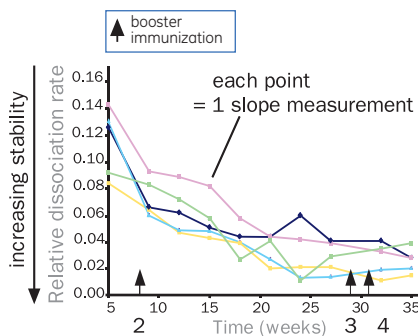
Assay comparison: Anti-IgE ELISA results from Resistentia Pharmaceuticals AB.

	Biacore	ELISA
Intra-assay CV	0.35%	22%
Inter-assay CV	3.7%	38%

Excellent reproducibility compared to ELISA: Samples run in triplicate in five separate assays.

Maturation of immune response:

Increasing stability was seen for all immune responses up to 20 weeks, but there was little further maturation after this time. The final two boosters had no effect on kinetic maturation of antibody responses.



Qualitative assessment of binding stability from real-time analysis: Relative slope calculations from early dissociation phases of binding curves enabled monitoring of relative antibody: antigen binding stability in relation to immunization regime.

Take interaction analysis beyond kinetics

Thermodynamics for better-informed prediction of structure-function relationships

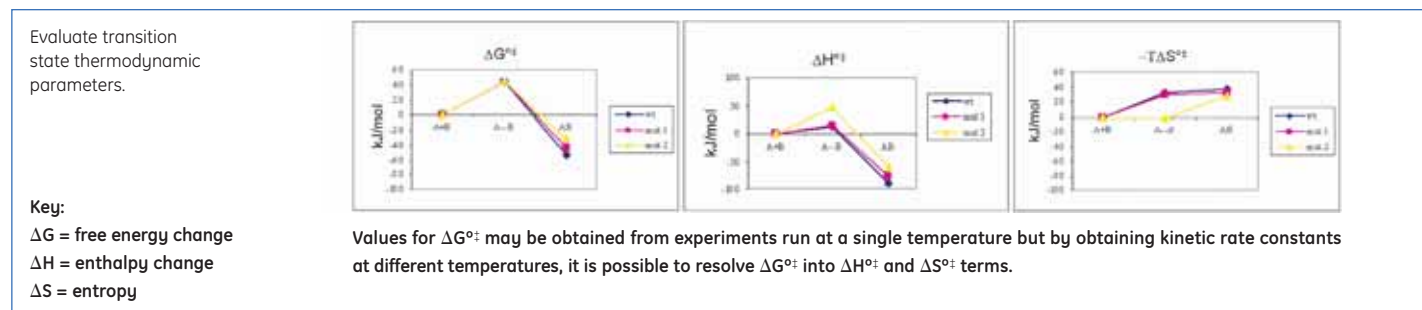
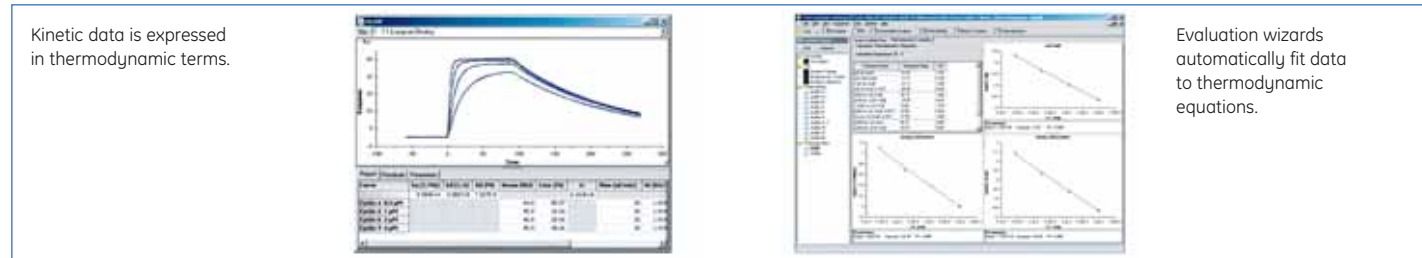
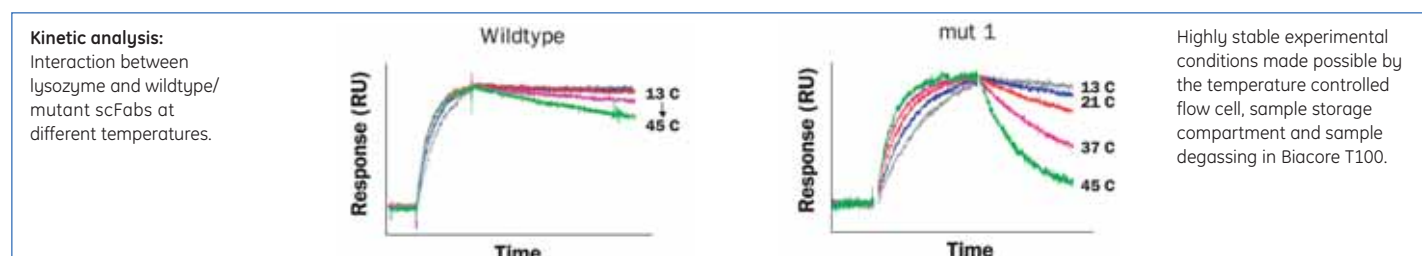
Kinetic characterization gives information about the rate of complex recognition and stability, but to understand *why* the interaction proceeds at these rates, it is necessary to define the thermodynamics of the system.

Fully understanding molecular recognition by being able to predict binding energetics through thermodynamic analysis can provide the basis for structure-based molecular design of drugs and engineered antibodies.

What do you need to know?	Biacore T100 delivers
Binding strength	Affinity constants
Reaction rates	Kinetic rate constants
Why reactants bind with a certain strength	Equilibrium thermodynamics
Why complexes associate and dissociate at specific rates	Transition state thermodynamics

Define the mechanisms that drive molecular interactions

Showing a case study on the interaction between hen egg lysozyme and single chain Fabs



Conclusion: Association of the mutated Fab, mut 2, with lysozyme proceeds according to a very different molecular mechanism from that governing either wild type or mut 1. The difference is apparent only if activation free energy, derivable using Biacore T100, is resolved into its enthalpic and entropic components, by performing kinetic analysis over a range of temperatures.

Biacore T100 - for label-free interaction analysis

The key to critical decision-making from research to QC

“I strongly believe that this application of protein interaction analysis could play a very important role in preclinical and clinical research programs for novel immunotherapies and vaccines, enabling better treatment regimes for patients and reduced cost of goods for pharmaceutical companies.”

Stefan Persson, PhD, Vice-President,
Safety Pharmacology and Toxicology,
Resistentia Pharmaceuticals AB, Sweden.

“We find Biacore T100 to be exceptionally easy to run, with intuitive operating and analysis software. The ability to collect high-quality data at elevated temperatures and to automatically switch between multiple buffer systems expands the application of Biacore as a biophysical tool for characterizing protein interactions.”

David Myszka, PhD,
Director, Center for Biomolecular Interaction Analysis,
University of Utah, USA.

Biacore would like to thank all our collaborators involved during the development of Biacore T100:
D. Myszka and J. Papalia, University of Utah; P. Flynn, K. Luehrsen and M. Baer of KaloBios Pharmaceuticals Inc.; S. Persson and M. Fant of Resistentia Pharmaceuticals AB and Professor Izumi Kumagai, Dr Kouhei Tsumoto and Dr Takeshi Nakashini, Tohoku University.

Among these collaborators, the system has earned a solid reputation for delivering unmatched performance and exceptional data quality.

“Biacore provides the best available analysis of affinity and binding kinetics for our protein therapeutic candidates.”

Peter Flynn, PhD,
Director, Biochemistry Research,
KaloBios Pharmaceuticals Inc., USA.



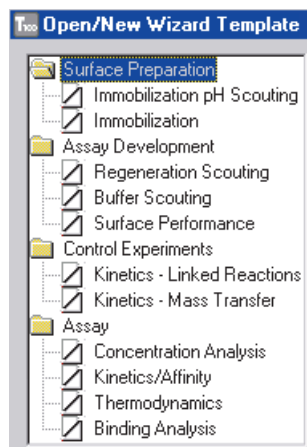
Highest quality data at your fingertips

Versatility and ease of use

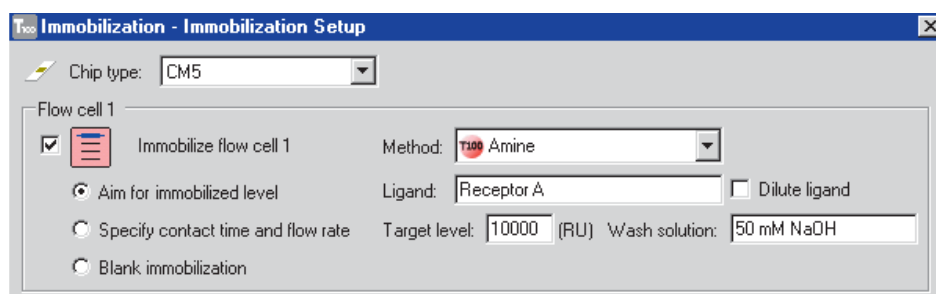
An intuitive user interface with control and evaluation wizards at every stage makes interaction analysis easier than ever.

Evaluation wizards for every interaction parameter give you results within seconds.

Develop, prepare and perform an analysis with control software wizards leading you step by step



- Guided immobilization of one interaction partner to a sensor chip surface.
- Tools for easy optimization of assay conditions.
- Guided control experiments for kinetic assays.
- Step-by-step guidance for efficient set-up and running of interaction assays.



Each wizard offers a high level of guidance and support.

Interaction information:

Quantitative kinetics (rate constants)- over the broadest range

Quantitative determination of affinity

Concentration determination

Determination of binding specificity (yes/no)

Thermodynamic measurements

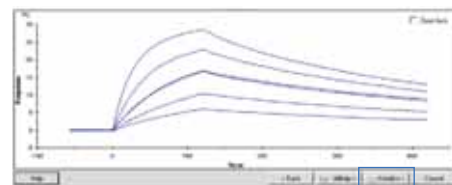
Rapid epitope mapping

A few clicks and your evaluation is complete

Open results file and select data required.

Choose evaluation wizard (data fitted to selected interaction model).

All kinetic parameters and relevant assay details displayed within seconds.



Assay	Concentration	Rate	Association	Association	Association	Association	Association	Association	Association
Assay 1	10000	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Assay 2	5000	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Assay 3	1000	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Assay 4	500	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Assay 5	100	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01

Ideal for work in regulated environments

Comprehensive compliance support saves time during validation

- Analyze up to 384 samples automatically
- Use buffer scouting to speed up assay development or to compare the effect of buffer components on interaction parameters
- Follow interactions at physiological temperatures to improve predictability of *in vivo* behavior
- Determine thermodynamic parameters of an interaction
- Benefit from additional support for assay development, analysis and evaluation when working with LMW compounds <1000 Da



With excellent temperature control and integrated buffer degassing, Biacore T100 ensures reproducible results when working at elevated temperatures or with temperature-sensitive samples.

Biacore T100 GxP Package

For those working in GLP/GMP/GCP environments, the addition of a Biacore T100 GxP Package ensures the highest level of GxP support and 21 CFR Part 11 compliance.

This package includes:

- Biacore T100 GxP Software (requires Windows® 2000 or Windows XP Professional and includes Biacore T100 GxP Control Software and Biacore T100 GxP Evaluation Software)
- Biacore T100 GxP Handbook
- Instrument and software handbook
- Validation support

Validation support

- 21 CFR Part 11 assessment report
- Software conformance certificate
- Hardware conformance certificate
- Supplementary documentation and services (upon request)
 - ESCROW agreement
 - On-site audit
- GxP services including Equipment Qualification

Equipment Qualification and training

Equipment Qualification and training are performed by GMP-trained, qualified personnel when the system is installed in its selected operating environment.

Our Equipment Qualification Services meet worldwide regulatory expectations and include:

- IQ/OQ (Installation Qualification/Operational Qualification)
- IPQ (Initial Performance Qualification)
- Preventive Maintenance (PM) GxP

Sensor chip selection guide

Right system – right sensor surface

You've chosen the right system

Now choose the right sensor surface and the right reagents and buffers.

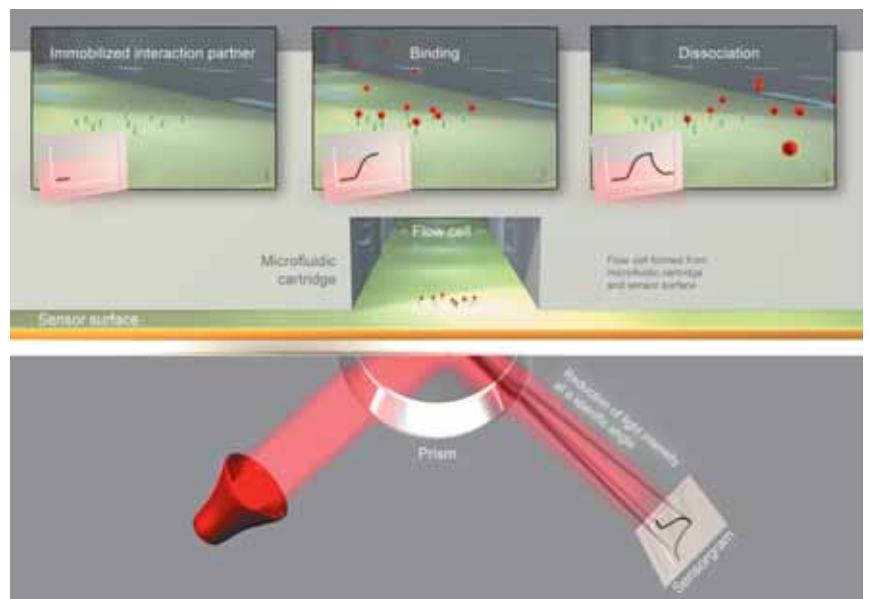
To study an interaction, one of the interaction partners is immobilized onto a sensor surface. Immobilization occurs by direct coupling to the surface or via a capture molecule coupled to the surface.

A range of sensor chips ensures that the most suitable sensor surface can be chosen according to the nature of the molecule to be coupled and the requirements for the analysis.

	Series S Sensor Chip CM5	Series S Sensor Chip CM4
Molecule to be immobilized		
Proteins	● The first choice for immobilization of proteins via -NH ₂ , -SH, -CHO, -OH, -COOH	◐ Useful if contaminants have a high positive charge
Tagged proteins	● For GST-tags (surface is derivatized with anti-GST antibody)	
LMW molecules, typically <1000 Da	●	◐
Membrane-associated molecules		
Nucleic acids	● When modified with an amine group	◐ Useful if contaminants have a high positive charge
Carbohydrates	● When modified with an aldehyde group	◐ Useful if contaminants have a high positive charge
Viruses or intact cells		

● Recommended choice

◐ Good alternative



Real-time interaction analysis utilizes the phenomenon of surface plasmon resonance.

Series S Sensor Chip CM3	Series S Sensor Chip C1	Series S Sensor Chip SA	Series S Sensor Chip HPA	Series S Sensor Chip L1	Series S Sensor Chip NTA
○ If partner in solution is very large e.g. a molecular complex	○ If partner in solution is multivalent or very large e.g. a molecular complex	● When biotinylated			
					● For His-tags
○					
			● Incorporate molecule into a lipid monolayer	● Incorporate molecule into a lipid bilayer	
○ If partner in solution is very large e.g. a molecular complex	○ If partner in solution is multivalent or very large e.g. a molecular complex	● When biotinylated			
○ If partner in solution is very large e.g. a molecular complex	○ If partner in solution is multivalent or very large e.g. a molecular complex	● When biotinylated			
● Keep large particles close to the surface to maintain sensitivity	● Keep large particles close to the surface to maintain sensitivity				

Recommendations in this table are based on the experience of scientists who have studied thousands of different protein interactions since the first Biacore system was introduced.

Interactions are monitored by injecting samples over the prepared surface of a sensor chip. Between injections, the surface is regenerated by selective dissociation of the interaction partners.

Visit www.biacore.com to learn more about interaction analysis.

Series S Sensor Chips for Biacore T100



Certified sensor chips are the first choice for use in regulated environments. All certified Series S Sensor Chips are subjected to the highest stringency of QC and delivered with a Certificate of QC. A non-certified Series S Sensor Chip CM5 is also available.

Service and support

Getting the most out of label-free interaction analysis

A comprehensive range of service programs, support tools and information services is available to support the system range. Our goal is to provide you with the optimum level of support so that your Biacore system continues to make a key contribution to your work.

Online support including:

Operational Assistance:

- BIA simulation to perform dry-run experiments
- Tech tips & protocols
- Immobilization and regeneration database to help quickly optimize experimental conditions

Software and downloads

- Download the latest software version
- Download and review software notes, handbooks and the latest news about your system and software

Training

- Getting started kit
- Training courses

Instrument service

- Service contract
- Extended warranty
- Maintenance visits

Validation support

- Validation and qualification services
- GxP Services with IQ/OQ performed on-site

Publications

- On-line reference database

MSDS

- Find Material Safety Data Sheets relating to consumables

Online product center

- Find up-to-date prices, product descriptions and ordering information
- Generate personalized purchase lists



GE Healthcare
Biacore AB
Rapsgatan 7
754 50 Uppsala
Sweden

www.biacore.com

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