# Biacore™ 1 series systems

LABEL-FREE INTERACTION ANALYSIS

Biacore™ 1 series systems (Fig 1) is a one-needle platform with six flow cells that helps simplify protein interaction analysis using surface plasmon resonance (SPR)—making it simpler and faster to use without compromising quality. Now you can focus on generating the consistent and reproducible data needed in your research.

Our Biacore 1 series SPR systems come in three configurations: Biacore 1K, Biacore 1K+ and Biacore 1S+. The systems offer analytical flexibility that can grow with your group's need for sample capacity, sensitivity, and throughput.

All systems are built for analysis in a GxP-regulated environment. The single software platform for Biacore 1 series systems speeds up time to results and reduces training needs.

Application methods are easily transferred to other labs or to other Biacore 1 series systems and the higher throughput Biacore 8 series systems.

You can use Biacore 1 series systems across a wide range of applications, molecules, and both pure and complex samples—from small fragments to large viruses. The systems are scalable so your research will not be limited as your needs evolve.

**Biacore 1 series SPR systems provide ease of use and shorten your time to results**

- No programming skills needed to set up and start the analysis when using predefined methods.
- Flexible software tools speed up the assay development.
- Straightforward transfer of methods to other Biacore 1 series or Biacore 8 series systems.
- Reduced time to competency, faster result generation and evaluation.
- Simpler data interpretation: compile, visualize, and export data with results within minutes in typical workflows.
- Novel injection and experiential-design tools enable multi-complex applications, delivering deeper, high-quality insights from each sample.
- Maximize run efficiency—queue methods or assays and let it run overnight or over the weekend.


**Fig 1.** Biacore 1K, Biacore 1K+, and Biacore 1S+ systems are based on a robust SPR platform with the flexibility that makes it easier and faster to generate consistent and reproducible interaction data with minimal effort. The Biacore 1K system can be upgraded to Biacore 1K+ system.

## Microfluidic design maximizes assay set up and reduces your running cost

Biacore 1 series one-channel-flow system consists of six flow cells arranged in series. Compared to other one-needle Biacore SPR systems, this equals an increase in the number of flow cells by 50% to 200%—maximizing assay set up. When using Biacore Series S sensor chip, you reduce your cost as the number of flow cells are increased from four (as in Biacore T200 and Biacore S200 systems) to six flow cells.

The flow cells can be addressed individually as single flow cells (1, 2, 3, 4, 5, 6) and in pairs (1/2, 3/4, 5/6) (Fig 2A). Biacore 1K+ and Biacore 1S+ systems can also address flow cells in series; in quadruplets (1234, 3456) or all together in sequence (123456) (Fig 2B).

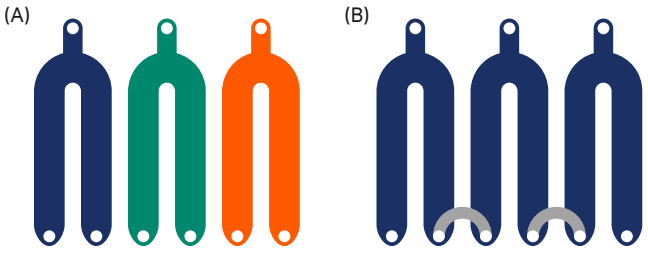


**Fig 2.** Schematic representation of the six flow cells through the channel flow path. The wider blue, green or orange paths are in contact with the sensor surface and addressed in pairs (A) or serial all together (B) which is possible for Biacore 1K+ and Biacore 1S+). White circles are inlets and outlets and the gray paths connect the flow cells.

## More information, faster with 40% reduced analyte consumption

Increased analytical capacity speeds up assay development and analysis and enables you to verify and confirm results using the extra flow cells. You can save assay time, sample quantity, and sensor chips (Table 1 and 2).

The use of six flow cells and the ability to perform a single analyte injection over multiple ligands in series is a good example how you can save sample quantity. Figure 3 shows an antibody screening experiment to identify yes or no binding to the antigen. The screen consists of 15 antibodies that were captured on Sensor Chip Protein A. We performed the analysis in only three cycles (five antibodies per cycle) on Biacore 1K+ or Biacore 1S+ systems compared to five cycles for Biacore T200 system (three antibodies per cycle). As a result, the analyte consumption was reduced by ~40% in Biacore 1K+ and Biacore 1S+ systems compared to Biacore T200 system (Fig 3).


**Fig 3.** Analyte (antigen) injected over five captured antibodies per cycle in an experiment set up on Biacore 1K+ system, saving ~40% of analyte consumption compared to Biacore T200 system. (Illustration from Biacore Insight Control Software).

**Table 1.** Performance overview of Biacore systems with six versus four flow cells (with flexible flow cell addressing)

| Application example | Recommended flow cell addressing | Biacore 1K+ and Biacore 1S+ systems | Biacore T200 and Biacore S200 systems | Benefits of six instead of four flow cells per sensor chip |
|---|---|---|---|---|
| | | 6 flow cells | 4 flow cells | |
| • Yes/no binding studies<br>• Antibody screening<br>• Kinetic screening<br>• Epitope binning | One reference flow cell, serial analysis | 5 active flow cells, 1 reference flow cell | 3 active flow cells, 1 reference flow cell | Additional two flow cells available<br>• Increase number of ligands by 60%<br>• Reduce analyte consumption by 40% |
| • Kinetic determination<br>• Affinity determination | One reference flow cell per flow cell pair | 3 active flow cells, 3 reference flow cells | 2 active flow cells, 2 reference flow cells | Additional flow cell pair available<br>• Increases analytical capacity by 50%<br>• Reduces sensor chip cost by 1/3 |
| • Concentration analysis | No reference flow cell required | 6 active flow cells | 4 active flow cells | Additional two flow cells available<br>• Measure six components in one injection of a complex sample |

**Table 2.** Performance overview for Biacore systems with six versus two flow cells (restricted to pairwise flow cell addressing)

| Application example | Recommended flow cell addressing | Biacore 1K system | Biacore X100 system | Benefits of three instead of one flow cell pairs per sensor chip |
|---|---|---|---|---|
| | | 6 flow cells | 2 flow cells | |
| • Yes/no binding studies<br>• Kinetic determination<br>• Affinity determination | One reference flow cell, serial analysis | 1 active flow cell, 1 reference flow cell | 1 active flow cell, 1 reference flow cell | Additional two flow cell pairs available<br>• Triples the number of interaction analyses per sensor chip<br>• Reduces sensor chip cost by 2/3 |
| • Concentration analysis | No reference flow cell required | 2 active flow cells | 2 active flow cells | Additional two flow cell pairs available<br>• Triples the number of concentration analyses per sensor chip |

## Increased sample capacity

Biacore 1 series systems support the use of 96- and 384-well microplates in standard and deep-well formats up to 2 mL volume.

The sample hotel of Biacore 1K system accommodates one tray, holding one microplate and one reagent rack. The sample hotel of Biacore 1K+ and Biacore 1S+ systems accommodates two trays (holding one microplate and reagent rack each) (Fig 4), increasing the unattended run capacity by 100% compared to Biacore T200 and Biacore S200 systems.

Tray(s) may be accessed during run to optimize operational efficiency for Biacore 1 series systems. The sample hotel can be cooled down to 4°C, enabling the analysis of sensitive samples in unattended runs of up to 60 h for Biacore1K system, and up to 72 h for Biacore 1K+ and Biacore 1S+ systems.

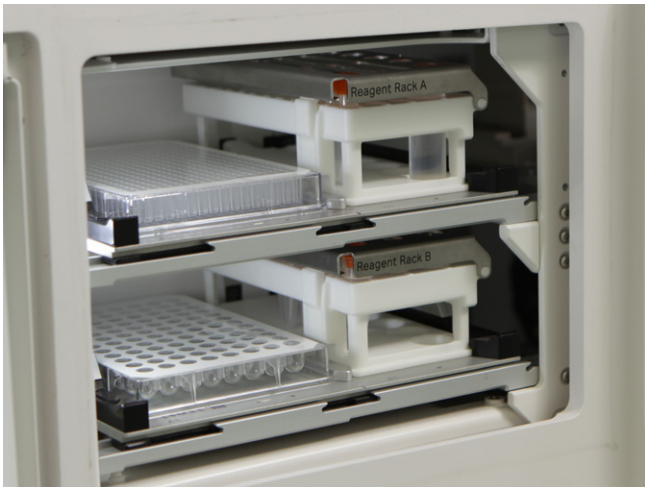


**Fig 4.** The sample hotel of Biacore 1K+ and Biacore 1S+ accommodates two trays. Each tray can hold one 96-well or 348-well plate and one reagent rack.

## High quality data and low short-term noise

Low molecular weight (LMW) drug discovery and fragment-based drug discovery (FBDD) seeks binders to weak, less conserved binding sites. This trend places more importance on the sensitivity of detection techniques used. The high-sensitivity Biacore 1 series systems allow the analysis of the smallest organic compounds—even for low-affinity interactions ($K_D$ in the millimolar range). This is important for reliable, small molecule fragment screening. Biacore 1 series systems let you work with large, multidomain targets or rare or sensitive targets, like G protein-coupled receptors (GPCRs) where only a fraction of the target maintains its biological activity during preparation and analysis. The higher sensitivity allows lower surface densities to be used, which simplifies data interpretation. A lower density surface can give fewer secondary interactions and increase the proportion of the target accessible for binding. Some targets may aggregate on the surface at very high densities and can be challenging for less sensitive instruments.

Analysis may be performed directly in crude matrices such as a membrane preparation, avoiding unnecessary sample handling that risks negatively affecting the activity level.

The high-quality instrument design, low short-time noise, and high signal stability across Biacore 1 series systems allow sensorgrams to be clearly separated down to very low resonance unit (RU) responses. In Biacore 1S+ system, this enables sensorgrams to be separated in the milli-resonance unit (mRU) range (Fig 5). You can be confident in your data analysis, even if the highest concentration gives a response below 0.5 RU.

The combination of the low short-term noise and the 40 Hz data collection rate in Biacore 1S+ system increases resolution in rapid off-rates and enables determination of off-rates up to 6 $s^{-1}$. The 40 Hz data collection rate increases the number of data points collected in a pre-determined time and improves the accuracy of rapid on- and off-rate determinations (Fig 6).

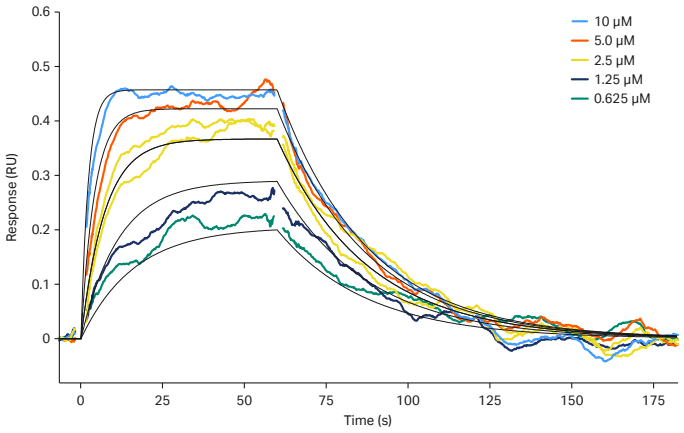


**Fig 5.** The high sensitivity of Biacore 1S+ system enables confident analysis of data, even if the highest concentration gives a response below 0.5 RU. (Data: CBSA binding to carbonic anhydrase II. Data fitted to 1:1 binding model. Max. response [$R_{max}$] 0.5 RU).

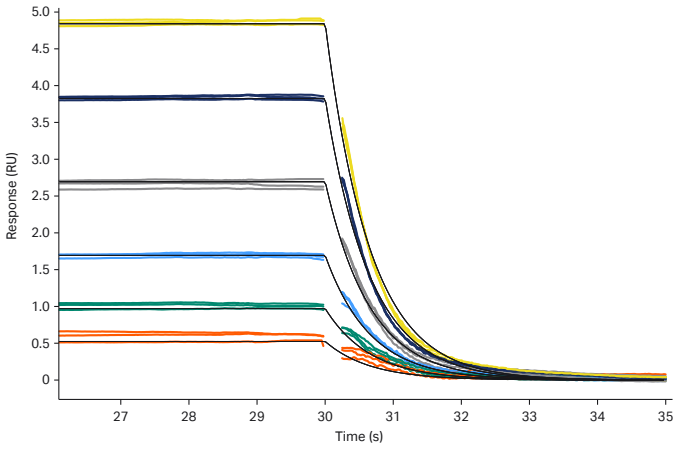


**Fig 6.** Fast kinetics (k 2 $s^{-1}$) resolved confidently below 5 RU using a collection rate of 40 Hz. Biacore Multi-Cycle Kinetics (MCK) analysis showing excellent triplicate data at 37°C. (Data: sulpiride binding to carbonic anhydrase II).

# Remarkable sensitivity across Biacore 1 series systems detects samples down to 1 pM

Concentration analysis is supported on all three Biacore 1 series systems via Biacore Insight Concentration and Potency Extension. The remarkable sensitivity of the instruments enables detection down to 1 pM (Fig 7).

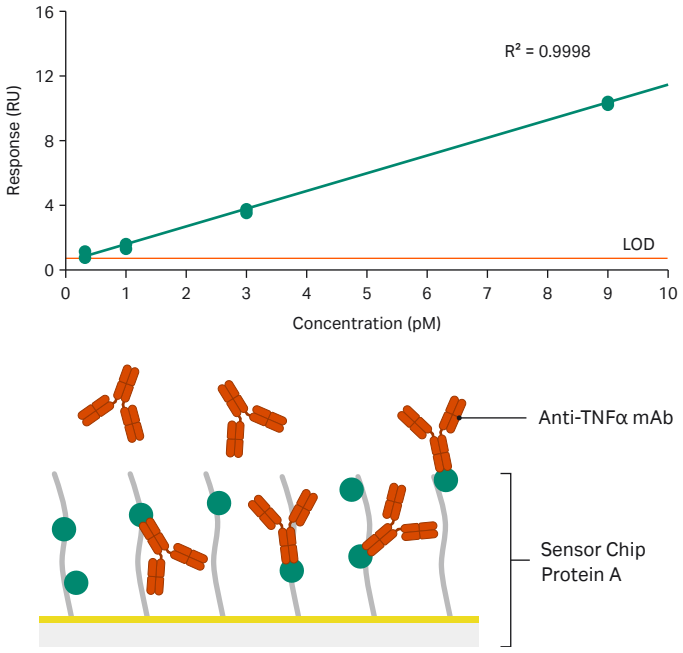


**Fig 7.** All Biacore 1 series systems were able to detect analyte responses of 1 pM (Biacore 1K system shown). Ten replicates of buffer were used to calculate the limit of detection (LOD = average + 3 × standard deviation). (Data: human monoclonal anti-TNFα antibody [0.3–27.0 pM] interaction to Sensor Chip Protein A using 20 min injection time).

# Regulatory-ready comparability assessment

Biacore SPR technology is a key tool for comparability assessment, providing robust, reliable, and detailed binding kinetic data, when interactions can be described by defined binding models. However, for heterogeneous interactions or those involving secondary binding events, full kinetic analysis is not always feasible or meaningful.

In these cases, ***Sensorgram comparison*** offers a powerful alternative by comparing complete interaction profiles of a test molecule against a reference (Fig 8). This approach generates an easily interpretable similarity score, expressed as a percentage, enabling objective comparison even when kinetic modeling is challenging. ***Sensorgram comparison*** is therefore particularly well-suited for biosimilar development and for complex binding interactions where conventional kinetic analysis is limited.

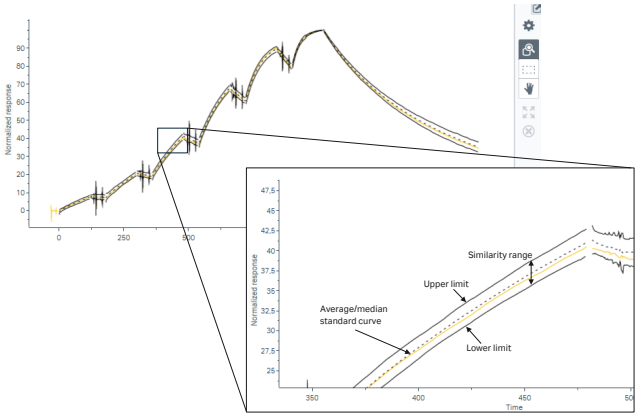


**Fig 8.** The similarity score (0–100) quantitated how much of the sample curves is within the similarity range. A score of 100 is fully within the limits. Lower scores indicate deviation.

# Distinguish tight binders with confidence

High quality instrument design, low short-time noise, and high signal stability across Biacore 1 series systems allow for reliable determination of very slow off-rates down to $10^{-6}$ $s^{-1}$—providing effective differentiation between stable binders. Biacore Single-Cycle Kinetics (SCK) is when a series of sample concentrations (normally three to nine) are injected one after the other in the same cycle. By using ***Single-cycle kinetics,*** you have a better chance for slow interactions to reach saturation. Assay time is significantly reduced compared to ***Multi-cycle kinetics***, because a single dissociation time is added after the last sample injection. Figure 9A shows a Biacore Single-Cycle Kinetics (SCK) experiment (five injections) in which a dissociation time of one hour was used to accurately determine the dissociation. Figure 9B shows Biacore Single-Cycle Kinetics (SCK) experiment (nine injections) in which two antibodies during affinity maturation were distinguished on their dissociation characteristics.

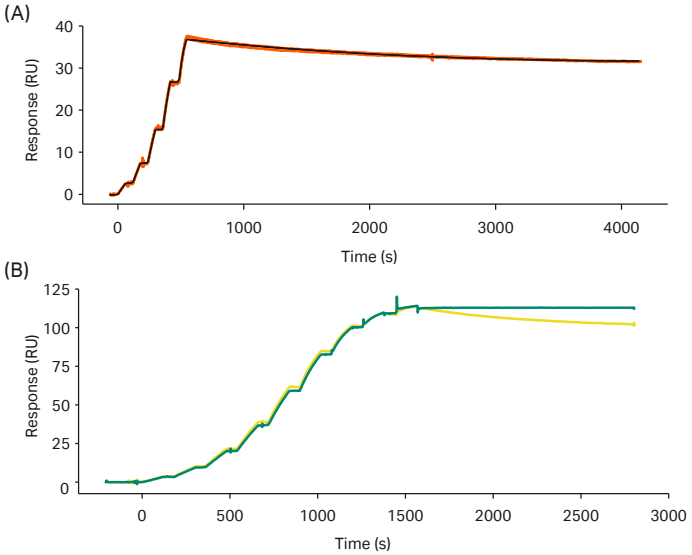


**Fig 9.** (A) Determination of slow dissociation to $k_d$ 2 × $10^{-4}$ $s^{-1}$ on Biacore 1K+ system. (Data: TNFα binding to a monoclonal anti-TNFα antibody captured on Sensor Chip Protein A). (B) Differentiation of two samples during affinity maturation (***Single-cycle kinetics*** with nine injections). (Courtesy: Medical University of Vienna).

# Expand application versatility

Biacore 1 series systems come with innovative injection tools that allow for versatile assay design.

The ***Dual*** command in Biacore Insight Control Software injects two solutions in sequence with no intermediate running buffer or washing steps (Fig 10). ***Dual*** may be used to overcome a common issue in epitope binning—low affinity of the binding between the antigen and first antibody. This results in dissociation of the antigen and therefore an underestimation in binding level of the second antibody. To minimize dissociation, the antigen and second antibody may be injected using ***Dual***.

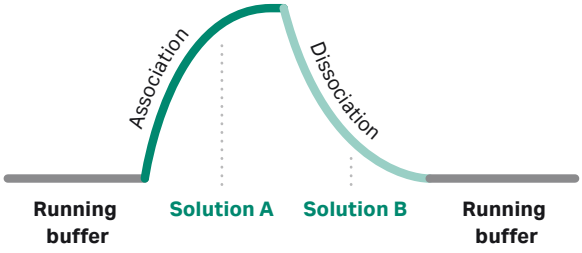


**Fig 10.** The ***Dual*** command injects two solutions in sequence with no intermediate washing steps between Solution A and Solution B.

***Dual*** can also be used to study dissociation of a protein to a ligand in various buffer compositions. Another use is the study of the pH dependency of antibody-like molecules to mimic endosomal pH effects on antibody-drug-conjugates dissociation to a target receptor. Figure 11 shows how the dissociation of a DNA binding protein to a DNA ligand increases with higher concentrations of nucleotide. The data of Solution B was then fitted to a 1:1 dissociation model in Biacore Insight Evaluation Software.

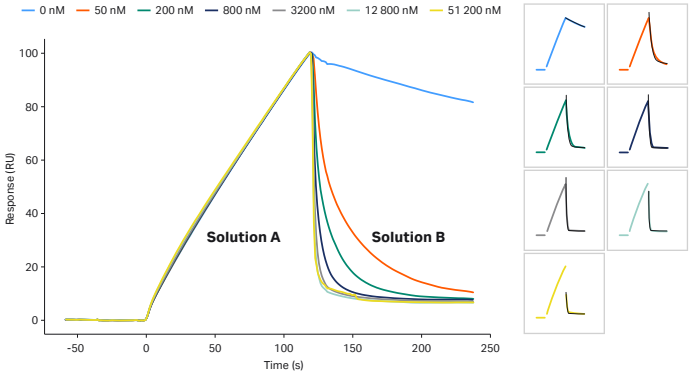


**Fig 11.** ***Dual*** command was used to inject a DNA binding protein (Solution A) immediately followed by running buffer containing increasing concentrations of nucleotide (Solution B) over a sensor surface with coupled DNA ligand. The DNA binding protein dissociates faster in the presence of higher concentrations of nucleotide. (Courtesy: A Fish, NKI-AVL, The Netherlands).

The ***ABA*** command allows two different solutions to be injected in the same cycle in the following order: solution A, solution B, then solution A (Fig 12). This enables buffer scouting to be run directly from a microplate because a temporary buffer condition for each sample is created. The ***ABA*** injection may also be used in competition assays. Data gathered using ***ABA*** can be fitted to kinetic models in Biacore Insight Evaluation Software.

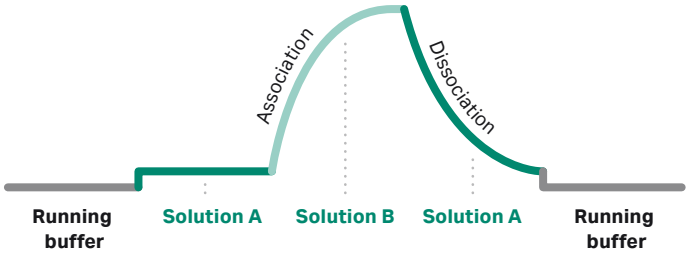


**Fig 12.** The ***ABA*** command allows two different solutions to be injected over the sensor surface in the same cycle in the following order: Solution A, Solution B, then Solution A.

With the ***Poly*** command, Biacore Insight Software gives you new possibilities for studies of protein complexes—including those formed by multivalent molecules such as PROTACs (proteolysis targeting chimeras) and their binding partners. The ***Poly*** command enables the injection of three to five solutions in sequence with no intermediate washing steps (Fig 13, 14).

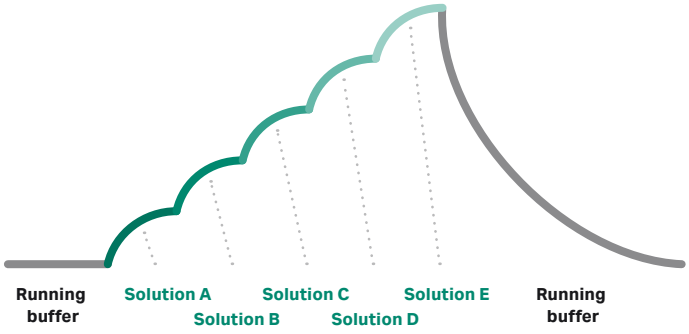


**Fig 13.** The ***Poly*** command enables multi complex formation by injection of three to five solutions (Solution A to Solution E) in sequence with no intermediate washing steps.

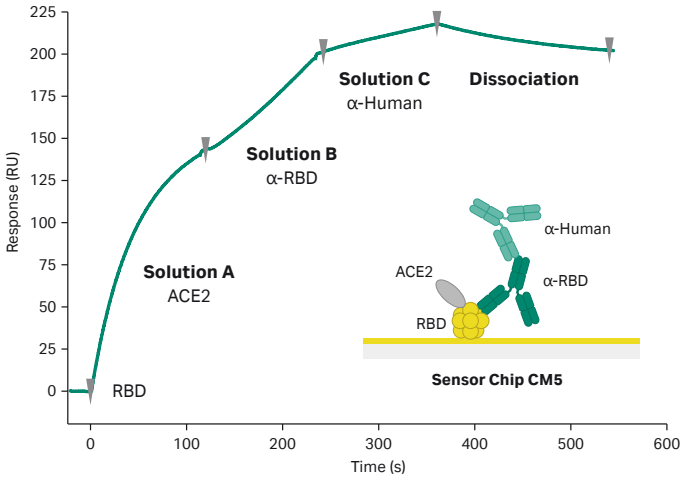


**Fig 14.** ***Poly*** command used as a tool to study protein complex formation. The receptor binding domain (RBD) of the viral-spike glycoprotein SARS- CoV-2 was coupled on Sensor Chip CM5. We used the ***Poly*** command with three injections to inject the ACE2 human receptor (Solution A), a monoclonal antibody against RBD (Solution B) and a mouse anti-human IgG (Fc) antibody (Solution C).

The new ***Inject and elute*** command, available with Biacore Insight Software version 6.0 and onwards, enables the recovery of bound analyte from the sensor surface and subsequent analysis of the eluate in technologies like mass spectrometry (Fig 15). These so-called ligand fishing experiments allow you to characterize the binding and identify the eluate, faster and with much reduced sample consumption compared to other technologies.

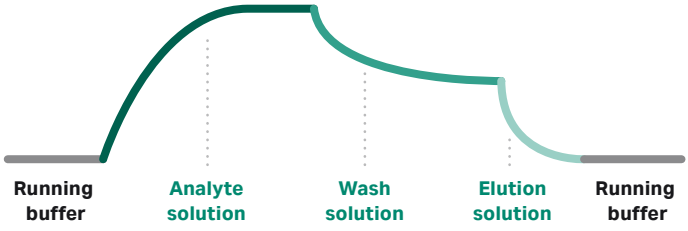


**Fig 15.** Schematic of the ***Inject and elute*** command.

### Optimized injection design

Biacore 1 series systems are designed to consume less of your sample compared to Biacore T200 and Biacore S200 systems. For a 2 min injection used in a kinetic experiment, Biacore 1 series systems use 103 µL of sample compared to 118 µL in Biacore T200 and Biacore S200 systems—saving you 15 µL (13%).

## Fast and flexible exploratory studies

The ***Interactive run*** workspace within Biacore Insight Control Software gives you control of the instrument while providing immediate feedback. In contrast to run methods, cycles are not defined in advance. Instead, you add commands and make decisions based on the result of previous injections, thereby building up the cycle as the run is proceeding.

***Interactive run*** is well suited for:

- Confirmation of surface activity after ligand attachment.
- Quick tests, such as testing whether new analytes can bind, or comparing a small group of analytes.
- Assay development for finding suitable concentration spans, injection times, and regeneration procedures.
- Training and demonstration of Biacore 1 series systems.

In Biacore 1 series systems, ***Interactive run*** data has full evaluation support, including kinetic fitting, giving a first value of affinity in your very first run (Fig 16).

**Fig 16.** Example of an ***Interactive run***. Each cycle contains an analyte injection (variable concentration) and a regeneration step. The full data set (seven cycles) was then fitted to a 1:1 model in Biacore Insight Evaluation Software (data not shown). (Analyte: beta-2-microglobulin. Ligand: Anti-beta-2-microglobulin amine coupled to Sensor Chip CM5).

## Queue up methods to free up time and save sensitive samples

To maximize instrument usage, utilize the ***Activity queue*** feature in Biacore Insight Control Software. The steps you usually take during analysis on a Biacore SPR instrument, from changing buffer solutions, chip docking, immobilization methods, analysis methods, temperature changes to cleaning procedure can be added to the ***Activity queue***—which minimizes unnecessary waiting times. For automatic control of the ligand attachment levels, ***Immobilization checkpoint*** can be added to the ***Activity queue***. This function reduces the need of manual confirmation of adequate immobilization prior to analysis by comparing the surface immobilization levels with acceptance criteria entered by the user. If any results fall outside the acceptance criteria, the ***Activity queue*** is paused, and user input is required to resume or stop the ***Activity queue***. If results are within the acceptance criteria, the ***Activity queue*** continues with subsequent activities (Fig 17).

Following start of the ***Activity queue***, remaining samples and reagents can be prepared while instrument is running. Run status display helps you further plan lab time.

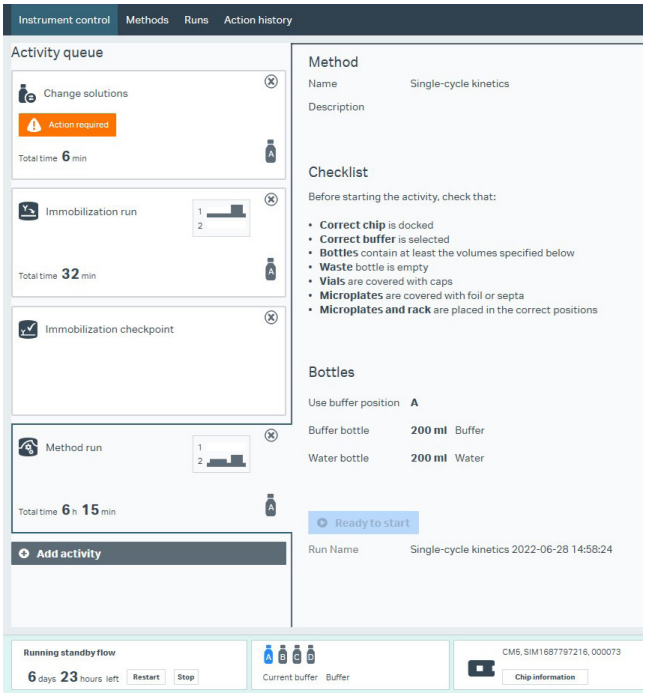


**Fig 17.** ***Activity queue*** lined up with ***Change solutions***, ***Immobilization run***, ***Immobilization checkpoint*** followed by a Biacore Single-Cycle Kinetics (SCK) method run.

When working with sensitive samples, the ***Activity queue*** and the temperature-controlled sample hotel is a powerful combination that lets you save sample, time, and costs. Assays using surfaces with sensitive ligands can be queued up in a time efficient manner overnight or over the weekend. Sensitive analytes requiring extensive sample preparation to maintain stability can be loaded in plates and stored in the sample hotel at 4°C until analysis.

The queueing ability is maximized in Biacore 1K+ and Biacore 1S+ systems, both instruments are equipped with a buffer selector and room for two microplates and two reagent racks.

## No programming skills needed

Biacore Insight Control Software comes with predefined run methods covering a wide range of applications. The predefined methods provide built-in knowledge and guidance on run settings such as sample run order, suitable intervals for control samples, injection times and concentrations. These methods can be used as is or serve as a good starting point that you can modify and save as you develop your assay.

## Biacore Insight Software—make SPR simpler and faster

Biacore Insight Software offers a streamlined approach to running, analyzing, visualizing, and exporting SPR data from Biacore 8 series and Biacore 1 series instruments. This unified platform for instrument control and data evaluation streamline all steps in your SPR workflows, while ensuring a user-friendly experience and maximum flexibility.

With our modular toolbox approach, you can choose the right tool for your analysis needs. Optional software extensions provide tailored solutions for key applications, enhancing functionality and further reducing your time to result:

- Biacore Insight Extended Screening—Accelerates discovery with precision and efficiency.
- Biacore Insight Concentration and Potency—Confidently determines active concentration and potency.
- Biacore Insight Epitope Binning—Flexible and streamlined epitope characterization.
- Biacore Insight Data Integration—Seamlessly integrates your SPR data for actionable insights.
- Biacore Insight GxP—Ensures compliance and quality in your SPR work.
- Biacore Intelligent Analysis™—Speeds up your evaluation workflows with machine learning.

Biacore Insight Software facilitates quick and efficient evaluations with just a few clicks. The versatile tools for data selection and visualization scale seamlessly with the size of your experiment, ensuring fast and reliable results. The interface can be customized to suit your preferred way of working. Integrated help, tooltips and guidelines accommodate users at any experience level, use case, or stage of research. Together with automated QC features, SPR data evaluation becomes a breeze.

After evaluation, flexible export features provide the means to export selected, or complete data sets for continued processing, result reporting, or storage. You can transfer data to Microsoft PowerPoint (Fig 18) and modify the presentation of your data using the extensive tool sets and layouts available. Additional export options are enabled by Biacore Insight Data Integration Extension. Allowing manual export in machine-readable JSON format as well as access to application programming interface (API) for fully integrated and automated data transfer to your organization´s data management systems.

For more details, please refer to our datafile, Biacore Insight Software.


**Fig 18.** The flexible result export feature in Biacore Insight Evaluation Software lets you export selected or comprehensive data for continued data processing, result reporting, or storage in a shared database. You can export data in Microsoft Excel, PDF, and Microsoft PowerPoint format. In this example, you can see a streamlined analysis of a kinetics experiment as a presentation in slide format.

## Support for working in regulated environment

We have a comprehensive offering to support the use of Biacore systems for interaction analysis in a GxP regulated environment. The optional products and services that can be used in combination with Biacore 1 series and Biacore 8 series systems are:

- Biacore Insight GxP Extension: a software that enables operations in compliance with current GxP regulations and is specifically designed with a high level of built-in support for 21 CFR Part 11 compliance. Features include ***Data integrity***, ***User authorization levels***, ***Audit trail***, ***Version history***. ***Electronic signatures*** are used for and approval of regulated procedures for run and evaluation of data and for approval of evaluated results.
- Validation support package: a system assessment report, conformance certificates, and Biacore Insight GxP Handbook with recommendations for system setup considering 21 CFR Part 11 compliance.
- Change control notification (CCN) service: a subscription service allowing users to be notified of system changes, giving increased process robustness in regulated environments.
- Cytiva's qualification service: ensures that systems are kept in a qualified state throughout their lifetime.

For more details, please see our data file on Biacore Insight GxP Extension and qualification services for implementation and use in regulatory environment.

## Biacore consumables for reproducible data with minimal time and effort

Biacore 1 series systems operate using the extensive range of Biacore Series S sensor chips, which offer support for analysis of a wide range of interactions. A variety of capture kits offer several options for capturing the most common antibodies and tags to significantly reduce the time and effort you need to spend on developing your assay. Predefined methods with application-relevant default settings are available for all major assays and preloaded in Biacore Insight Control Software. Experiments using predefined methods and Biacore consumables can be started in minutes.

The range of Biacore consumables also includes coupling kits, with selected reagents for stable, covalent attachment of the ligand to the surface. Convenient, ready-made buffers and solutions developed and verified to work in Biacore systems are also available to further enhance analysis efficiency.

## Join our family, Biacore SPR community

As an owner of a Biacore system, you are connected to a world of knowledge and experience in interaction analysis. A Biacore system comes with professional local application support from highly skilled and experienced application scientists who can help you get the most out of your Biacore system in all applications.

Thousands of Biacore systems are installed globally, and over 60 000 scientific articles are published in peer-reviewed journals.

All Biacore system users are invited to share their experiences and learn more at regional user days, Developments in Protein Interaction Analysis (DiPIA) conferences and on LinkedIn, Biacore SPR community.

From installation to end of life, our equipment service solutions are designed to ensure your Cytiva equipment delivers maximum performance and value throughout its life cycle, so you can stay on schedule. Whether you have in-house support teams or plan to rely (fully or partially) on Cytiva, we offer flexible service options to meet your specific needs. Our engineers are certified, regularly recertified, and focused solely on servicing Cytiva equipment, providing hassle-free installation, repair and maintenance.

Find out more about our service solutions at cytiva.com/equipment-services

# Systems specifications

**Technical specifications and characteristics**

| | |
|---|---|
| Detection technology | Surface plasmon resonance biosensor |
| Information provided | Kinetic and affinity data ($k_a$, $k_d$, $K_D$), specificity, selectivity, screening data, epitope binning, concentration and relative potency data |
| Data presentation | Monitoring of real-time sensorgrams or evaluation data for result tables and result plots |
| Analysis time per cycle | Typically 2 to 15 min |
| Automation | 60 h unattended run time for Biacore 1K |
| | 72 h unattended run time for Biacore 1K+ and Biacore 1S+ |
| Sample type | Small molecule drug candidates to high molecular weight proteins (also DNA, RNA, polysaccharides, lipids, cells, and viruses) in various sample environments (e.g., in DMSO-containing buffers, plasma, and serum) |
| Required sample volume | Injection volume plus 20 to 40 µL (application-dependent) |
| Injection volume | 1 to 400 µL |
| Flow rate range | 1 to 100 µL/min |
| Flow cell volume | 60 nL |
| Flow cell height | 50 µm |
| Data collection rate | 1 or 10 Hz for Biacore 1K and Biacore 1K+ |
| | 1, 10 Hz or 40 Hz for Biacore 1S+ |
| Sample/reagent capacity | 1 × 96- or 384-well microplate, normal, and deep-well |
| | 1 × reagent rack with 21 to 43 positions compatible with 0.7 to 4.4 mL vials (Biacore 1K) |
| | 2 × 96- or 384-well microplates, normal, and deep-well |
| | 2 × reagent racks with 21 to 43 positions compatible with 0.7 to 4.4 mL vials (Biacore 1K+ and Biacore 1S+) |
| Typical run times | Clean screen (384-well plate): 6 h |
| | Binding level screen (384-well plate): 15 h |
| | Affinity screen (48 analytes): 27 h |
| | Kinetic analysis (30 analytes): 15 h |
| | Concentration analysis (24 samples): 3h |
| | Epitope binning, 5 × 5 array (5 cycles): 1.5 h |
| Analysis temperature range | 25°C to 37°C for Biacore 1K and Biacore 1K+ |
| | 4°C to 40°C for Biacore 1S+ (at least 20°C below ambient temperature) |
| Sample storage | 4°C to 37°C for Biacore 1K and Biacore 1K+ (at least 18°C below ambient temperature) |
| | 4°C to 40°C for Biacore 1S+ (at least 18°C below ambient temperature) |
| Sample refractive index range | 1.33 to 1.39 |
| In-line reference subtraction | Automatic |
| Number of flow cells | Six in one channel |

| | |
|---|---|
| Dimensions (W × H × D) | 755 × 725 × 666 mm |
| Net weight total | 95 kg (Biacore 1K)<br>96 kg (Biacore 1K+ and Biacore 1S+) |
| Mains requirements | Processing unit: autorange voltage 100 to 240 V~, frequency 50/60 Hz |
| Power consumption | Processing unit: maximum 350 VA |

**Minimum computer requirements**

| |
|---|
| 64-Bit Windows 11 Enterprise or Professional Edition (English) |
| CPU with at least four cores, 2 GHz or faster |
| At least 16 GB internal memory |
| At least 200 GB free hard disk space |
| Screen resolution at least 1920×1080 |
| One USB2 port available for instrument connection |

**SQL database server requirements**

Biacore Insight Software includes SQL Server Express 2022 for local database setup only. A separate networked SQL database is required for full functionality. Performance improvements are seen with SQL Server Standard, SQL Server Enterprise, or SQL Data Warehouse version 2022 (available separately from Microsoft).

**Note:** The server needs to be supplied by the end user. Contact your local representative for the latest information regarding on-site requirements.

**Typical working ranges**

| | |
|---|---|
| Association rate constant ($k_a$) | Proteins: up to $3 \times 10^9$ $M^{-1}$ $s^{-1}$<br>LMW molecules: up to $5 \times 10^7$ $M^{-1}$ $s^{-1}$ |
| Dissociation rate constant ($k_d$) | $10^{-6}$ to 1 $s^{-1}$ for Biacore 1K and Biacore 1K+<br>$10^{-6}$ to 6 $s^{-1}$ for Biacore 1S+ |
| Sample concentration | ≥ 1 picomolar (pM) |
| Molecular weight detection | No lower limit for organic molecules |
| Short term noise typically | < 0.03 RU (RMS) for Biacore 1K and Biacore 1K+<br>< 0.01 RU (RMS) for Biacore 1S+ |
| Baseline drift typically | < 0.3 RU/min |
| Blank subtracted drift | < ±0.003 RU/min |
| Immobilized interactant consumption | Typically 0.03 to 3 µg/flow cell |

**Compliance**

| | |
|---|---|
| Compliant with | CE, cETLus, EAC, FCC, ICES-001, KC, RCM, UKCA |
| Safety | IEC/EN/UL/CSA-C22.2 61010-1, IEC/EN/UL/CSA-C22.2 61010-2-081, EN ISO 12100 |
| Electromagnetic compatibility (EMC) | EN/IEC 61326-1, FCC Part 15 B, ICES-001 |
| Environmental | EN 63000, China RoHS |

# Ordering information

| Product | Product code |
|---|---|
| Biacore 1K system<br>Includes:<br>Biacore 1K instrument (29712576);<br>2 licenses for Biacore Insight Software (29310602) | 29726017 |
| Biacore 1K+ system<br>Includes:<br>Biacore 1K+ instrument (29712577);<br>2 licenses for Biacore Insight Software (29310602) | 29726018 |
| Biacore 1S+ system<br>Includes:<br>Biacore 1S+ instrument (29712578);<br>2 licenses for Biacore Insight Software (29310602) | 29726019 |
| Biacore Insight Software extensions | Various licenses[1] |
| Biacore 1K+ Upgrade Kit<br>Includes:<br>Upgrade of Biacore 1K to Biacore 1K+ performed by Cytiva field service | 29719933 |

[1] See cytiva.com/biacore for details of the various e-licenses available.

**cytiva.com/biacore**



For local office contact information, visit cytiva.com/contact

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