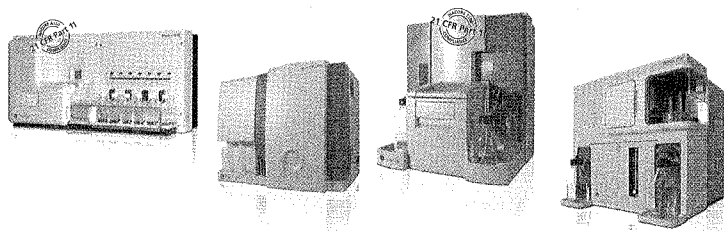


Label-free analysis of molecular interactions with Biacore systems



Interaction analysis: used throughout the life sciences

Understanding the nature of molecular interaction is fundamentally important in all areas of the life sciences. From the binding of a growth factor to its receptor to that of a drug compound to its therapeutic target, dynamic interactions between molecules drive and regulate all biological processes.



Biacore™ systems from GE Healthcare provide label-free, real-time interaction analysis delivering comprehensive characterization of binding events.

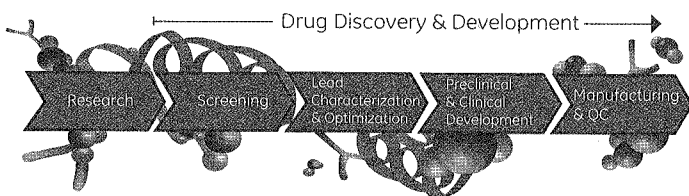
What does it tell you?

The high information content data provided by label-free interaction analysis enables scientists to fully understand binding events between almost any types of biologically relevant interactants:

- Do the potential interactants bind to each other?
- How specific is the interaction?
- How strong is the binding (affinity)?
- How fast are the on- and off-rates (kinetics)?
- What are the effects of temperature (thermodynamics)?
- How much interactant is there in the sample (concentration detected via specific binding partner)?

Who uses it?

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



How can the data be utilized?

- Observe and *understand* binding events
- Define and characterize key molecules in your biological system of interest and understand their functional interactions
- Screen and select better therapeutics, diagnostics or research tools, based on relevant binding properties
- Monitor the development of biopharmaceutical production and purification processes

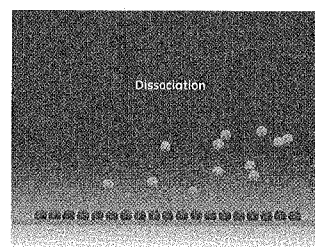
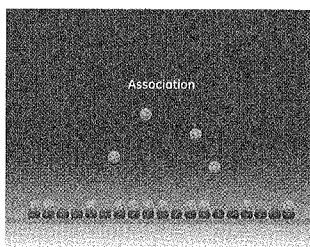
How is this achieved?

System characteristics

- Real-time detection and monitoring of interactions, without the use of labels
- Analysis of a wide range of interactants: LMW compounds (>200 Da), through proteins and nucleic acids, to viruses and whole cells - many sensor chip types available
- Efficient analysis facilitated by automated design and intuitive control and evaluation software

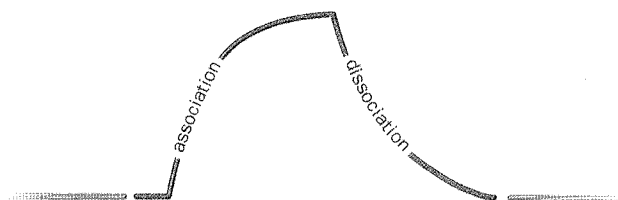
Assay basics

- One interactant is immobilized onto a sensor chip surface, the other is injected in solution and flows over the surface
- The entire interaction process (binding and dissociation) is monitored in real-time



Interactants in solution bind to molecules on sensor chip surface.

Interactants allowed to dissociate from complex on chip surface



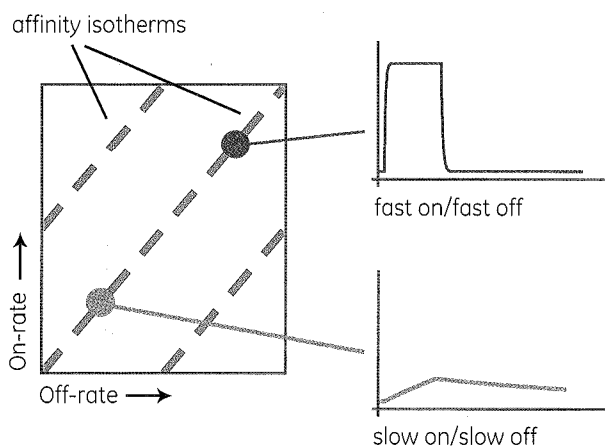
Real-time plot of binding response over time (the sensorgram) provides information about on-and off-rates.

Proven technology

- SPR (surface plasmon resonance) detection monitors interactions in real time via mass concentration-dependent changes in refractive index at the sensor surface
- High-performance microfluidics provide high quality analysis, including outstanding kinetic data
- Broad range of available surface chemistries enable analysis of a very wide range of interactants

Why is real-time analysis important?

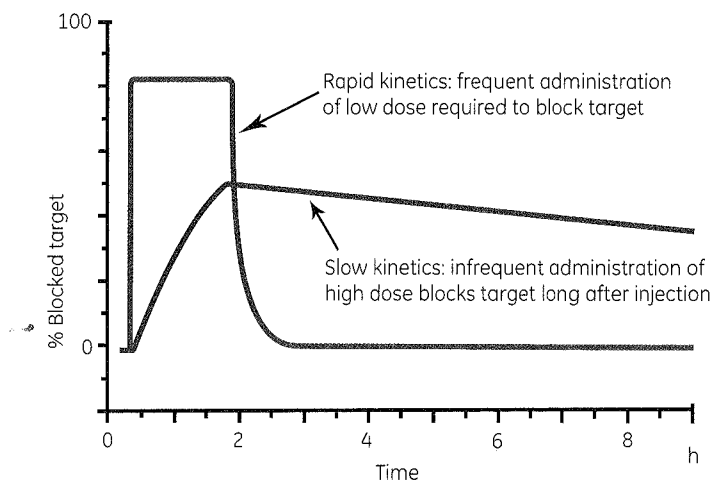
Biological processes are “real-time” events, driven and regulated by *dynamic* interactions between key molecules. End-point techniques offer a snapshot view of interactions, providing only basic information such as overall binding strength (affinity). This depends on the ratio of on-and off rates, so that equal affinity interactions can have very different kinetic properties. Real-time analysis with Biacore systems can provide the key data to discriminate these crucial differences:



On/off-rate map showing two molecules with identical affinities, but kinetic profiles differing by several orders of magnitude. These differences could not be seen by end-point analyses.

Interaction kinetics are fundamentally important for biological functions. Good kinetic data facilitates making the right conclusions and best decisions throughout the life sciences:

- Define the structure/function relationships
- Understand the dynamics and mechanisms of molecular pathways
- Select better drug candidates based on therapeutically important properties
- Select optimal binders as research tools for your chosen assay



Target-binding profiles of two hypothetical drug compounds with similar affinities but different kinetics: practical therapeutic consequences on dosing regimes.

Draw conclusions with confidence

- Information rich, real-time analysis of molecular interactions provides comprehensive characterization of binding events
- Exceptionally reliable, decisive data from systems with proven high quality and performance

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

Since 1990, Biacore systems have provided scientists with exceptional insights into molecular interactions.

For more information, visit www.biacore.com

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