

Information Biacore Provides

Yes/No Data

- » Is there binding?
- » Ligand Fishing
- » *Did animal produce Ab?*

Affinity Analysis: How STRONG?

- » Quantify K_D
- » *Rank Antibodies*
- » *Find best Ab pairs*

Concentration Analysis: How MUCH?

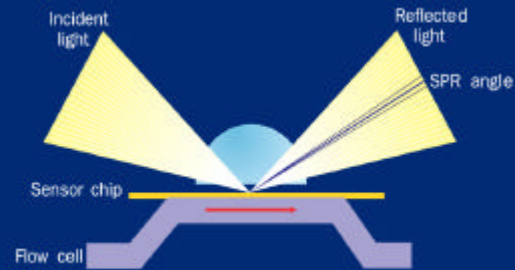
- » Active Concentration
- » *Assay Validation*
- » *Antibody Production*

Kinetic Rate Analysis: How FAST?

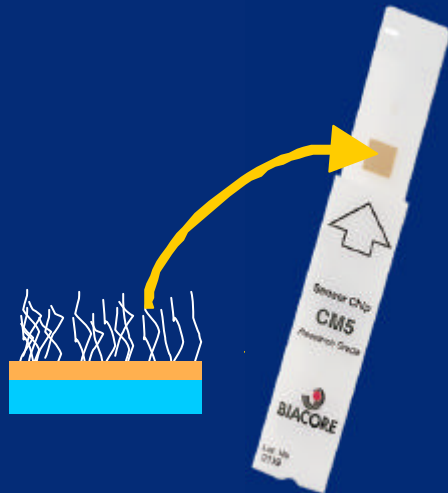
- » k_a k_{on} (recognition)
- » k_d k_{off} (stability)
- » $K_D = k_d/k_a$
- » *Ab selection; wash steps*



3 Cornerstones of the Technology



SPR (Surface Plasmon Resonance) Detection System



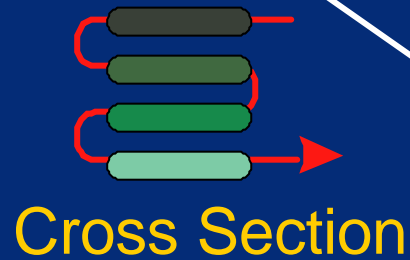
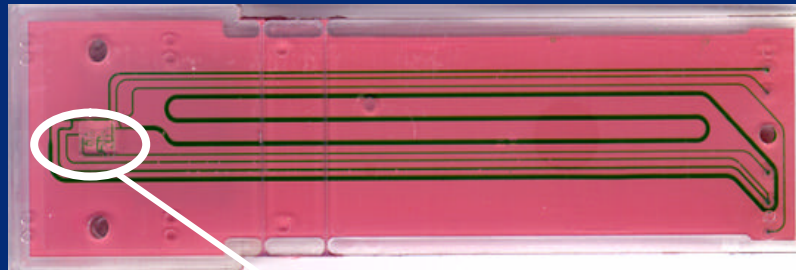
Gold-Dextran Surfaces



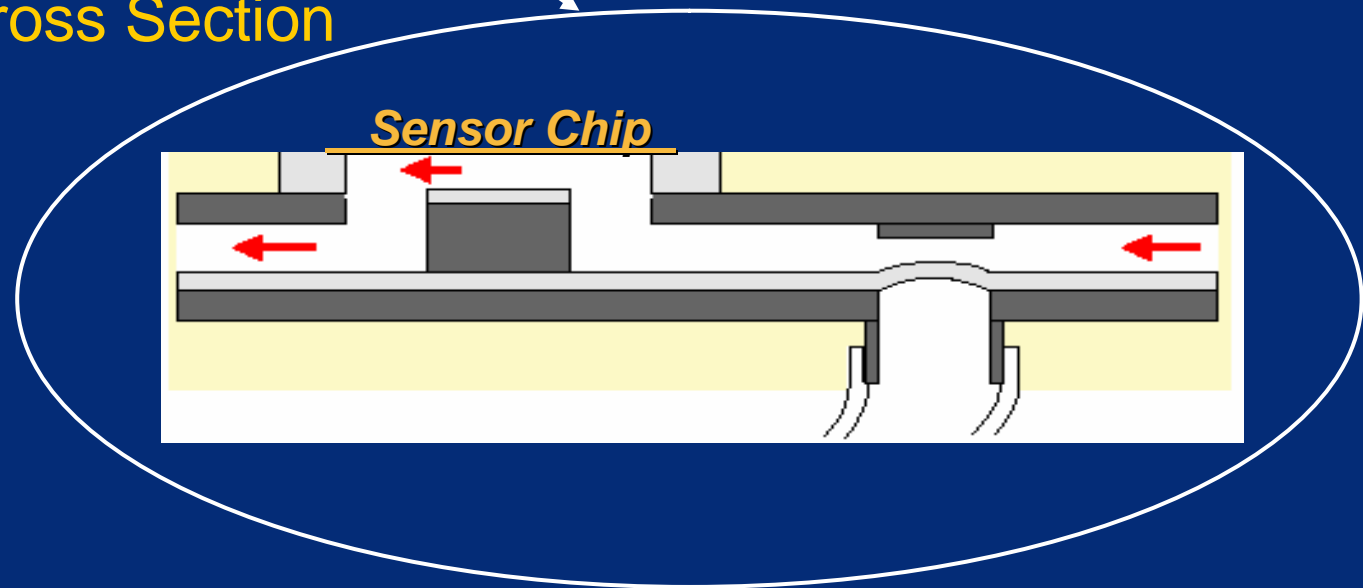
Microfluidic System

Precise Sample Introduction

IFC



- 4 Flow cells
- Serial Flow
- Single injection



User-Defined Biospecific Surface

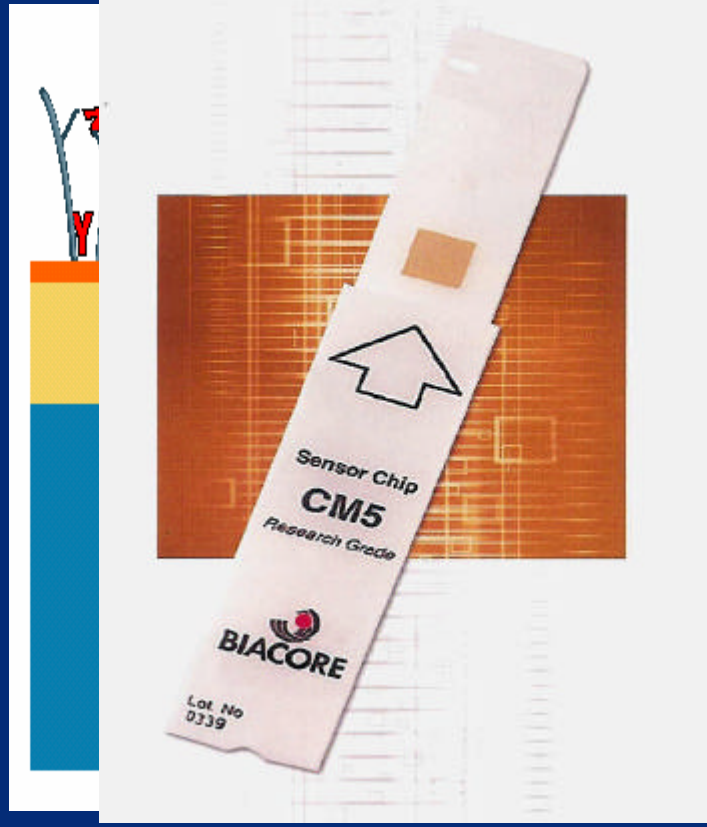
Specific Layer

Dextran Layer

Linker Layer

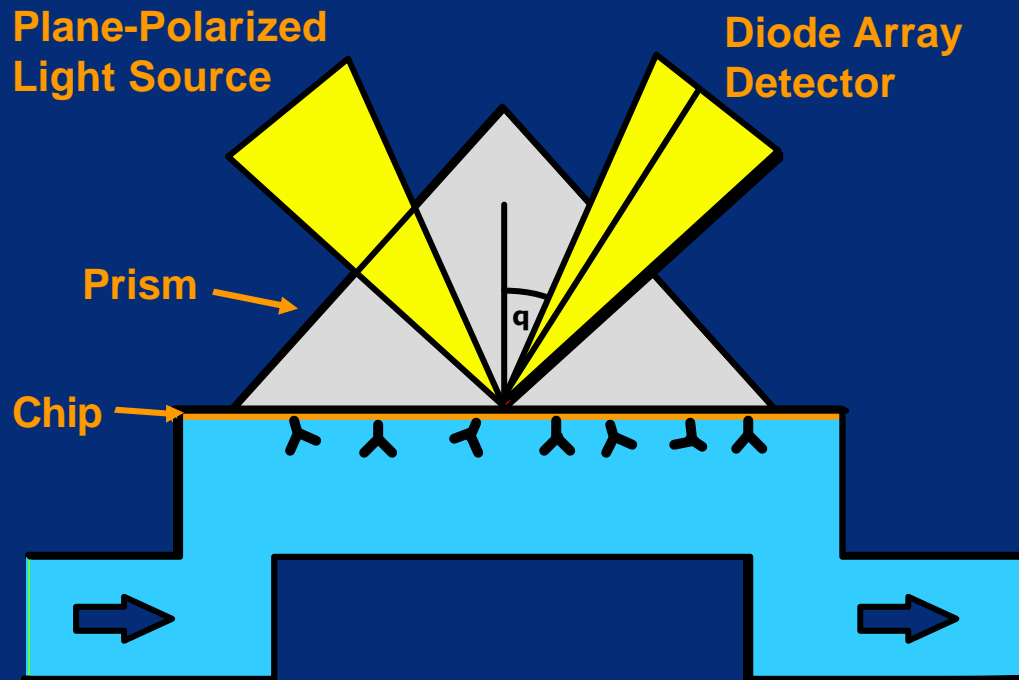
Gold

Glass



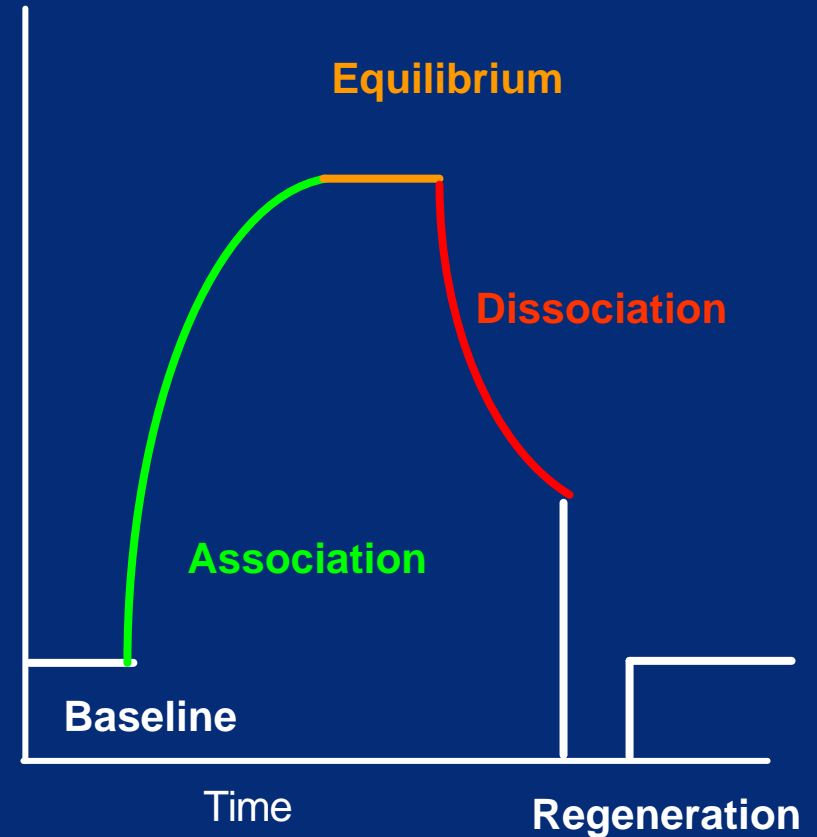
- Solution Behavior
- Robust & Reusable
- Variety of Sensor Chips Available

How Does SPR Detect Binding?



Sensorgram

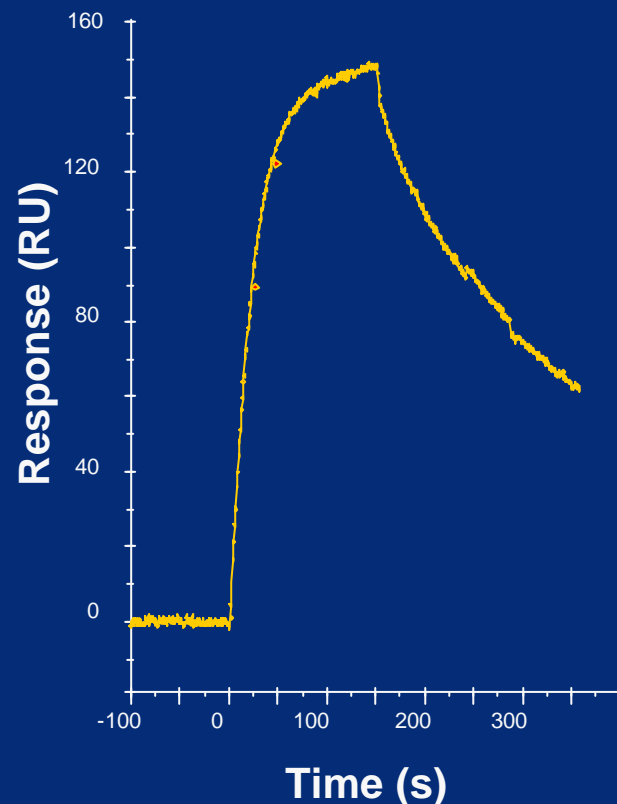
Response



End-point and Real-time Assays

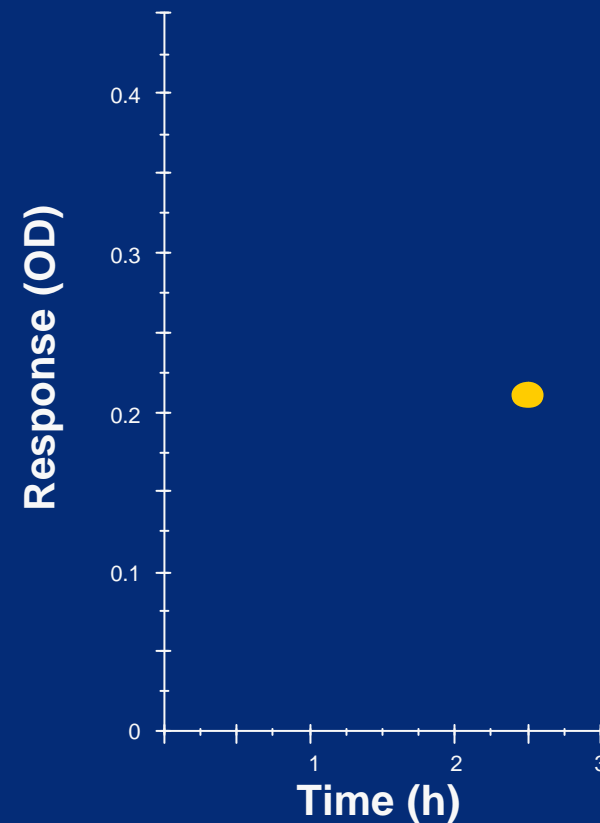
Biacore Analysis

- » Label free assay
- » Continuous measurement
- » Kinetic information



Standard Plate Assay

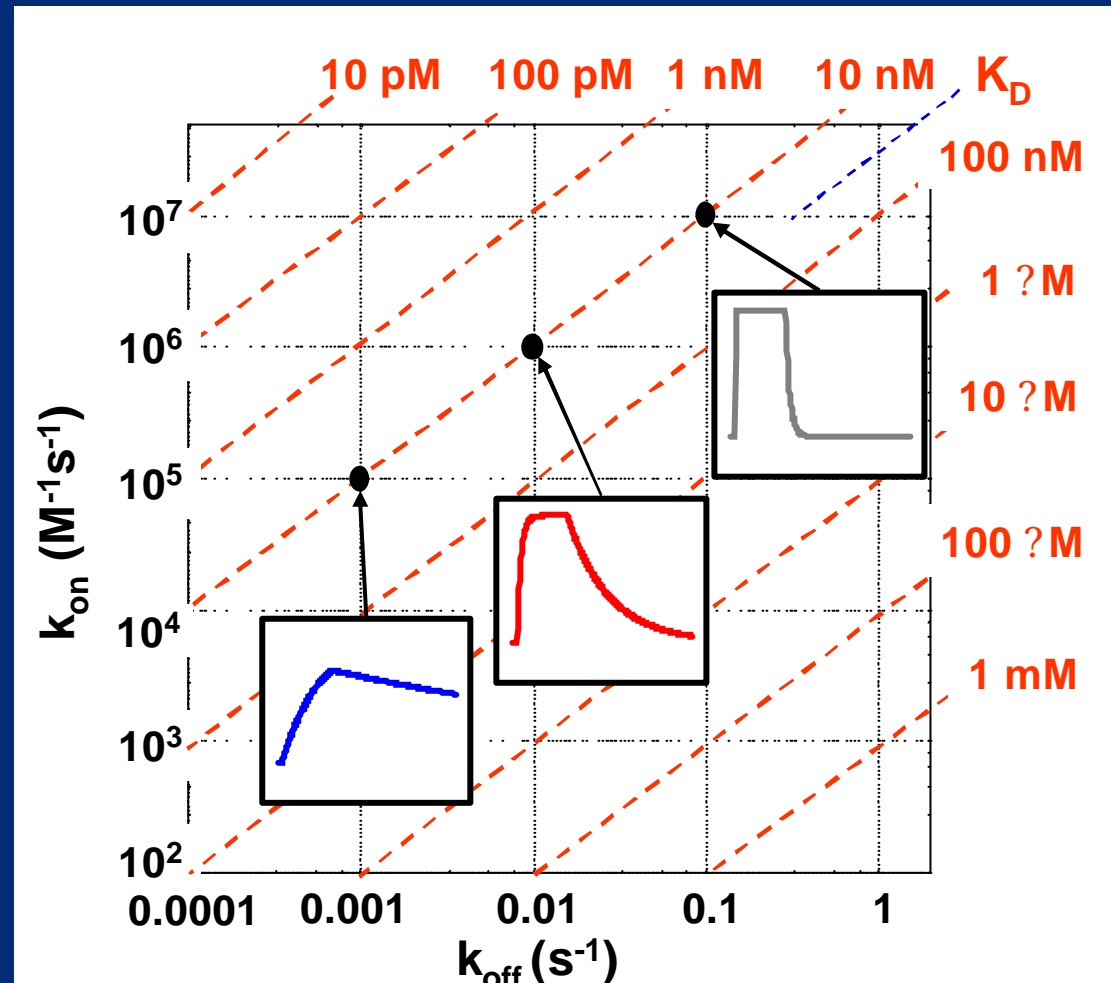
- » Detection of a label
- » Assay development is key
- » Multi-wells simultaneous



Kinetics Adds Value to Assays

- **Quantification of effects of structural changes on interactions**
 - » Understanding of structure-function relations
 - » Design of affinity pairs
- **Characterization of biopharmaceutical products**
 - » Recombinant proteins
 - » Characterization of the immune response in vaccine development/ antibody production
- **Development of assays based on affinity**
 - » Selection of reagents
- **Development of purification schemes**
 - » Selection of affinity ligands and conditions for use
 - » Study the effect on function of conditions used

Same Affinity, Different Behavior



$$\text{Affinity} = K_D = k_a/k_d = k_{off}/k_{on}$$

Antibody Characterization & Assay Validation

BIACORE®

- No purification
- No labelling
- Earlier characterization
- Kinetic information

BIACORE®

Isotyping
 Affinity
 Kinetics
 Epitope Map
 Assay
 Extended map
TOTAL

Time
 Day 1
 Day 1 & 2
 Day 1 & 2
 Overnight
 Day 2
 Day 3
2 - 3 days

Conventional

Method	Time
ELISA	One Day
RIA	Weeks + labelling
NA	NA
ELISA	Weeks + labelling
Various EIA	Days - Weeks
ELISA	One day + labelling
	Weeks - Months

Johne, B. et al. (1993) Journal of Immunological Methods 160:191-198.

