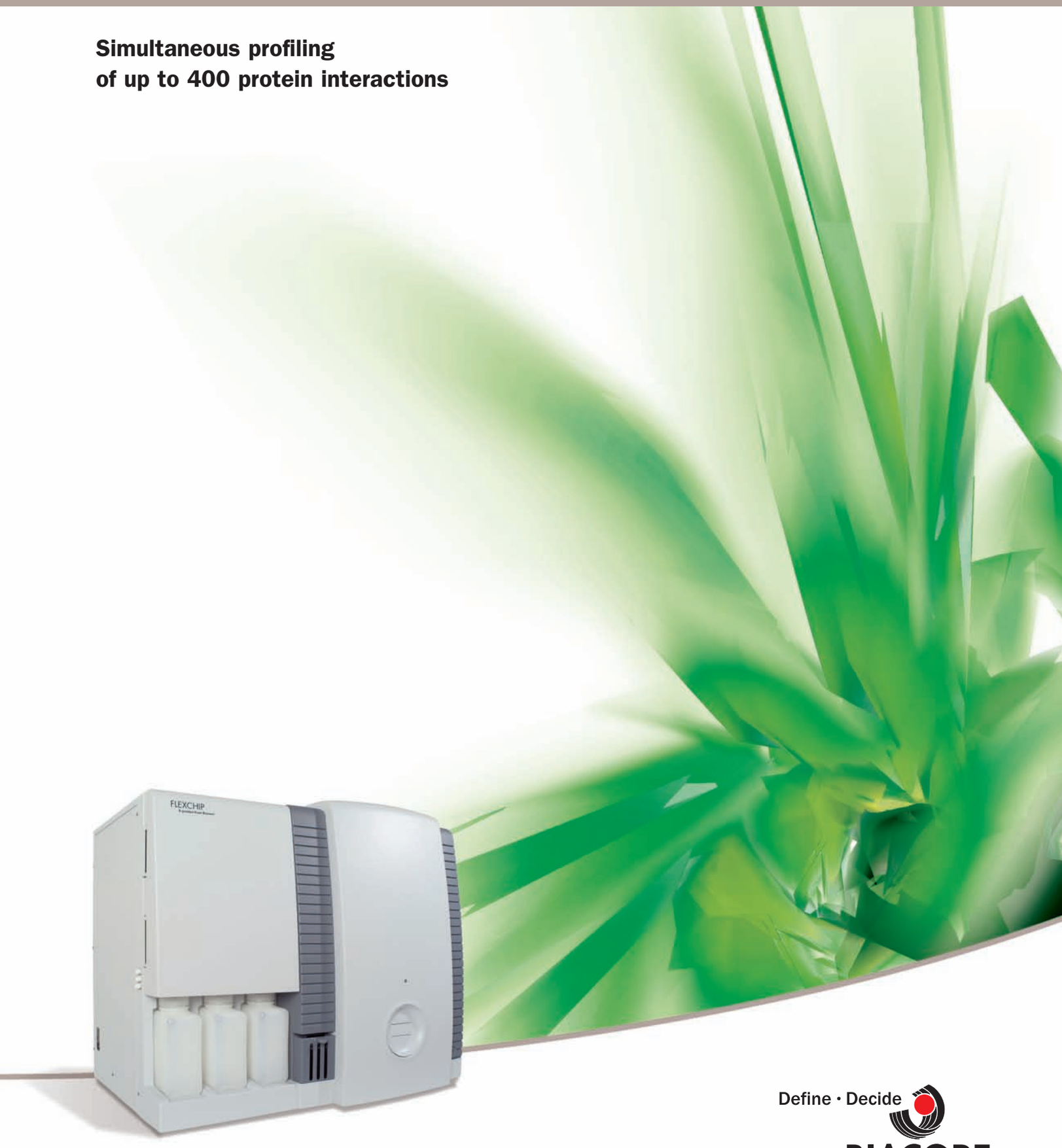
Flexchip

Simultaneous profiling of up to 400 protein interactions



Define · Decide

BIACORE

Base your decisions on the best

Simultaneous profiling of multiple interactions

For more than 15 years Biacore® systems have been providing scientists with exceptional insights into protein interactions.

Flexchip's array format now allows hundreds of protein interactions to be monitored simultaneously, in real time and without the use of labels.

- **Screen hundreds of protein interactions in real time and without labelling**
- **Select interactions of interest for downstream characterization**
- **Map biomolecular interaction networks and understand their functions**
- **Get more and new information in less time compared to classical assay formats**

Generate multiple interaction profiles

One sample interacting with 400 spots

Profile multiple interactions simultaneously

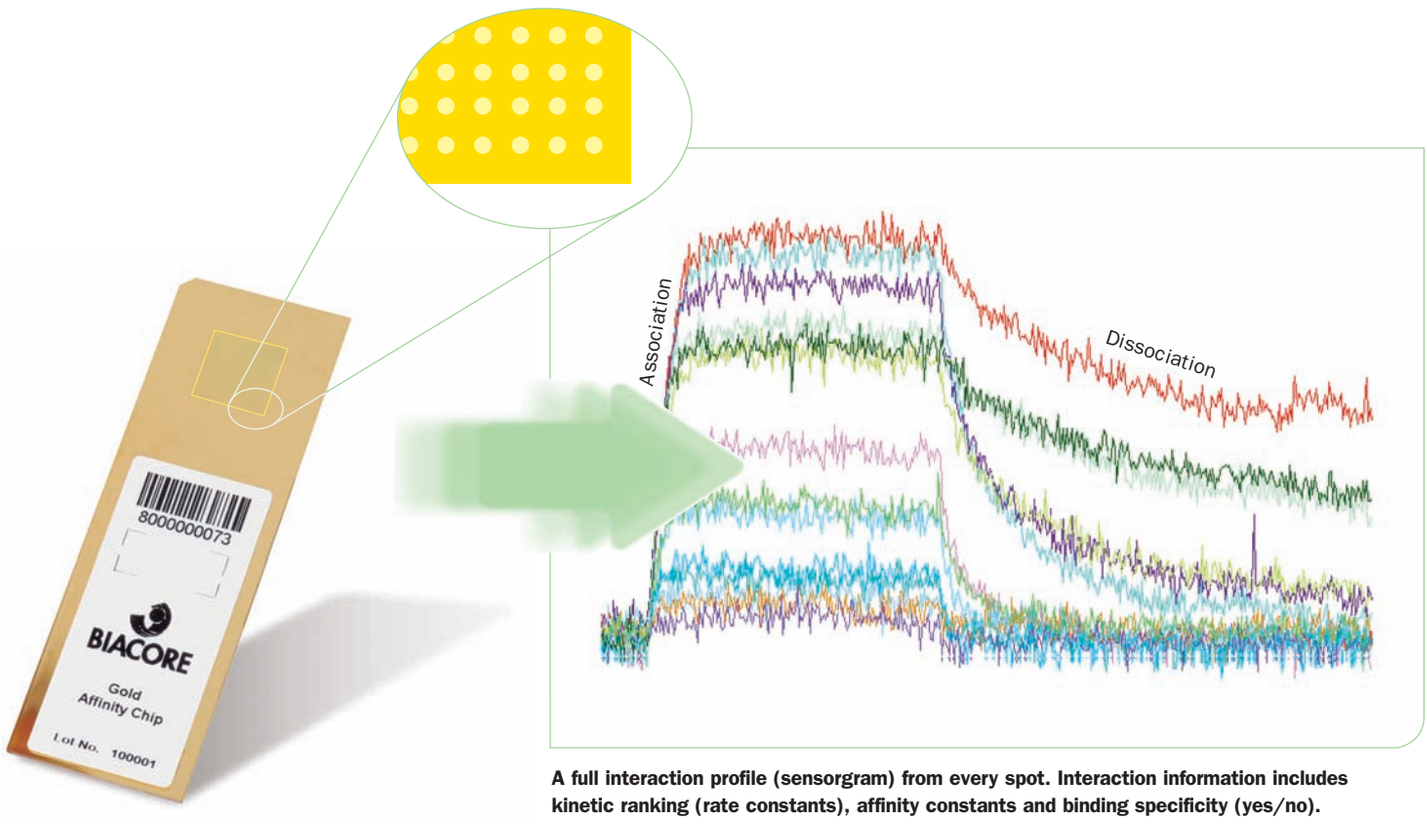
- Perform multiplex analyses
- Monitor protein-peptide, protein-protein and protein-nucleic acid interactions
- Monitor up to 400 interactions in less than 3 hours

Look at populations of interactants

- Screen protein to peptide libraries or cloned recombinants
- Map binding domains and epitopes
- Define specificities in protein or peptide populations
- Rank antibody candidates for early selection
- Assess the influence of post-translational modifications on interactions

Get end-point and kinetic information

- See kinetic profiles to select for further characterization
- Select the end-point of your choice – not limited to equilibrium measurements
- Detect low affinity interactions



A full interaction profile (sensorgram) from every spot. Interaction information includes kinetic ranking (rate constants), affinity constants and binding specificity (yes/no).

Interaction profiling step by step

Hundreds of real-time interaction profiles clearly presented and instantly evaluated

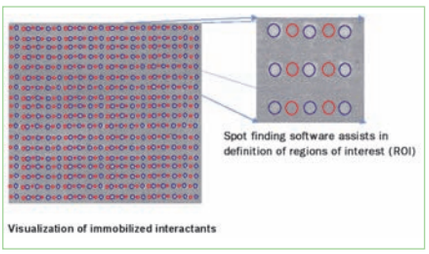
Step 1. Prepare chip:

Spot interactants on the sensor surface of the affinity chip using a commercially available spotter.

Use Flexchip Chip Definition Software to define the spot matrix (map from a micro-plate, import from spotter output files or enter manually).

Save definitions with unique barcode or generic text name.

Assemble the flow cell and insert the chip into the Flexchip instrument.



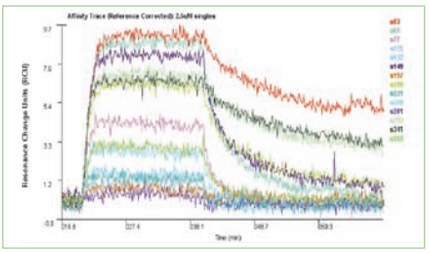
Step 2. Create method:

Define the regions of interest, sequence of operation, flowrates and duration.

Step 3. Run sample:

See interactions progress in real time as sensorgrams are displayed for each spot. Apply the recirculation function for economic use of samples and to allow long contact times between interactants.

Use less than 2 ml of sample for 400 interactions.



Step 4. Analyze results:

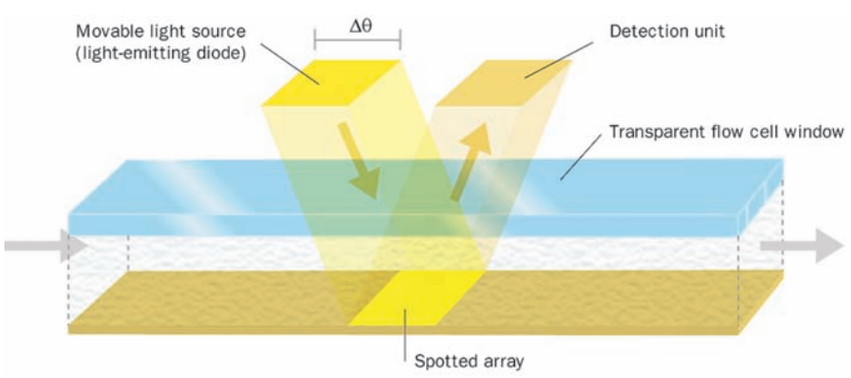
- Automatically generate affinity and kinetic rate constants for each interaction
- View sensorgrams: raw and reference corrected
- Multi-group analysis
- Statistical data including baseline, mid region and end region data (report points)
- Kinetic evaluation with and without mass transport constant
- Export graphs, charts, fitted curves for reports

Application versatility

A range of affinity chips

Disposable, bar-coded affinity chips (compatible with many commercially available spotters) are available for specific applications:

- **Protein-A/G for immobilization of anti-species immunoglobulin, enabling the capture of mouse or human antibodies**
- **NeutrAvidin for capture of biotinylated nucleic acid**
- **Plain gold for adsorption of proteins, thiolated peptides or SH-modified nucleic acids**
- **Streptavidin for capture of biotinylated proteins, peptides and other biotinylated molecules**



Utilizing SPR to follow reactions

Like all Biacore systems, Flexchip utilizes the natural phenomenon of surface plasmon resonance (SPR) for label-free, real-time interaction analysis. The technical configuration used in Flexchip is known as grating-coupled SPR (GC-SPR).

A gasketed cell window with an inlet and an outlet valve hermetically seals off the sensor surface (on which individual proteins have been spotted) to form a flow cell. The chip is then inserted into the instrument. Sample is injected through a single broad channel thereby interacting simultaneously with all spots on the array.

Incident polarized light covers the entire surface of the array enabling simultaneous measurement of interactions on all spots thus eliminating errors that could arise from sequential readings.

As incident light strikes the interactive face of the sensor surface, real time interaction profiles (sensorgrams) are generated from the individual spots. The small coupling angle of the incident light is conducive to multiple imaging and is thus well suited to screening applications. Spot-finding software assists in the definition of sample and reference regions of interest (ROI).

Technical information and specifications

Flexchip - Simultaneous profiling of up to 400 protein interactions

Detection technology	Grating-coupled surface plasmon resonance (GC-SPR) biosensor
Information provided	Kinetic rate constants (k_a and k_d) and affinity constants (K_D), specificity
Data presentation	Real time monitoring of sensorgrams
Analysis time per cycle	<1.5 hours (endpoint analysis) - <2 hours (kinetic analysis)
Sample type	Proteins (also DNA, RNA, polysaccharides and lipids)
Minimum required sample volume	1.6 ml
Sample/reagent capacity	3 sample tubes
Flow rate range	100-1500 µl/minute
Flow cell volume	46 µl
Flow cell height	200 µm
Capacity	96 or 384-well source plate using a contact spotter pin to deposit 1.5 to 4 nl onto chip surface
Spotting volume	5-20 µl
Spotting concentration	25-100 µg/µl
Sensor surface capacity	Up to 400 spots per chip in a 20 x 20 array, approximately 150-350 µm diameter per spot
Operating temperature range	20-37°C

Typical working ranges Kinetics:	
Association rate constant (k_a)	10^2 to 10^6 $M^{-1}s^{-1}$
Dissociation rate constant (k_d)	10^{-2} to 10^{-5} s^{-1}
Affinity constant (K_D)	100 µM to 10 pM
Sample concentration	15 µg/ml (400-1000 kD) to 250 µg/ml (8-20 kD)
Molecular weight detection	>5 kD
Sample refractive index range	1.30 - 1.43
Instrument	
Dimensions	770 x 520 x 647 mm
Net weight	225 lb (102 kg)
Mains requirements	AC voltage; 100-240 V Current; 3 A Frequency; 50/60 Hz
Data handling and storage	
PC operating systems	Microsoft Windows XP (Professional)

Service and Support

Biacore offers a comprehensive range of service programs, support tools and information services. 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. Visit our website to learn more.

www.biacore.com

BR-9004-23

Define • Decide

BIACORE