

THE WAVE OF THE FUTURE IN KINETICS

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sensors

Experience a new level of sensitivity
and flexibility in drug discovery.



Creoptix™ WAVE



Welcome to the next generation of label-free analysis.

By combining a level of sensitivity superior to Surface Plasmon Resonance (SPR) with a crude sample robustness normally only achieved with plate-based assays, the Creoptix™ WAVE system is revolutionizing the study of molecular interactions and changing the world of drug discovery.

With its unrivaled flexibility and leading sensitivity across the widest application range, WAVE brings all the benefits of label-free analysis to applications and workflows previously limited to NMR or ELISA.

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EASE OF USE MEETS UNPARALLELED PERFORMANCE.

Engineered around a proprietary waveguide interferometry technology, the WAVE system offers superior data quality across the broadest range of samples for unrivaled flexibility and unsurpassed insight—all made possible by the instrument's three core attributes:

Enhanced Sensitivity

- Most sensitive system on the market
- High resolution even at very low signal levels
- Low noise without artificial data averaging
- Reliable kinetics below 1 pg/mm²
- Avoids mass transport limitation and saves precious reagents by requiring lower immobilization levels

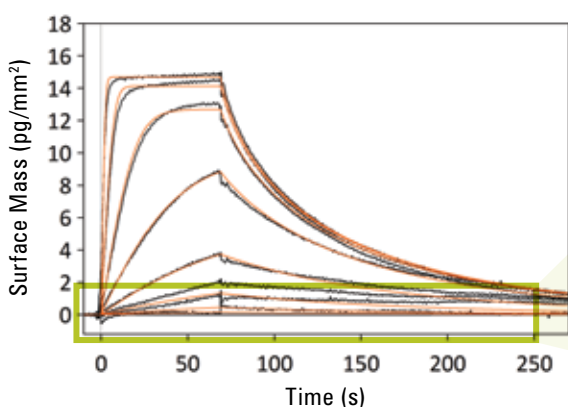
Fast Kinetics

- Ultra-fast transition times of 150 msec at 200 μ l/min flow rate and 40 Hz acquisition rate
- Reliable determination of off-rates of 5 sec⁻¹ and faster, enabling off-rate screening of very weak-binding analytes
- Significant expansion of the kinetic range to levels currently only achieved with NMR

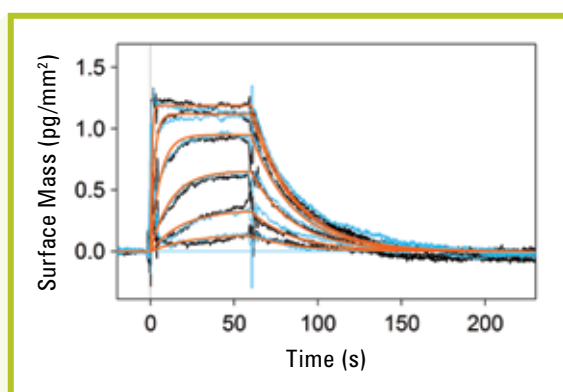
Most Robust Microfluidics

- Unique, no-clog design minimizes downtime
- Revolutionary combination of microfluidics and sensor in one disposable cartridge
- Compatible with even the toughest samples, including:
 - 100% serum
 - Membrane proteins
 - Virus-like particles (VLPs), viruses, or liposomes

Small molecules can't hide anymore.



With the industry's highest sensitivity, WAVE offers a whole new level of previously unattainable interaction data.



Ligand: Carbonic Anhydrase II (29 kDa)
 Analyte: Acetazolamide (222.25 Da)
 Immobilization level: 6'000 pg/mm² (left)
 231 pg/mm² (right)

EXPANDING THE BOUNDARIES OF DRUG DISCOVERY.

The Creoptix WAVE puts a breakthrough level of kinetics analysis at your fingertips by pushing the boundaries of affinity range and sample compatibility. The system's exceptionally high data quality, flexibility, and fast reporting time optimize drug discovery and enable new inroads into R&D.

- Patented Grating Coupled Interferometry (GCI) design leverages and enhances the intrinsic benefits of waveguide interferometry to exceed the sensitivity levels of SPR.
- GCI provides an evanescent field that penetrates less into the bulk and extends the light-to-sample interaction length for superior signal-to-noise ratios (0.015 pg/mm^2).

Surface Plasmon Resonance (SPR)



Light quickly attenuated creating small signals

Waveguide Interferometry



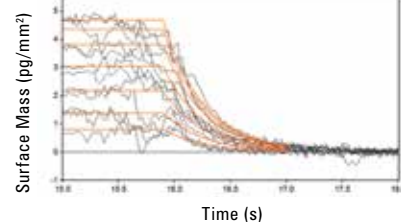
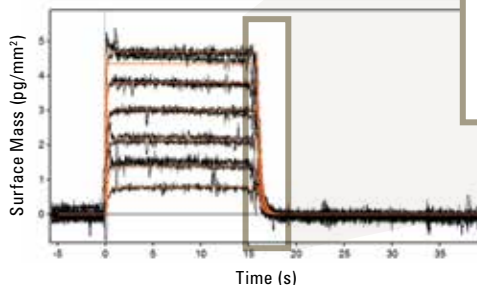
Long light-to-sample interaction creating high signals



WAVEcore—Small outside. Strong inside.

Sensitivity

- Fast kinetics (150 msec transition time) facilitate reliable analysis of off-rates of 5 sec^{-1} .
- True kinetics of weak binders enable the instrument to provide a faster, more affordable option to—or orthogonal method for—NMR.

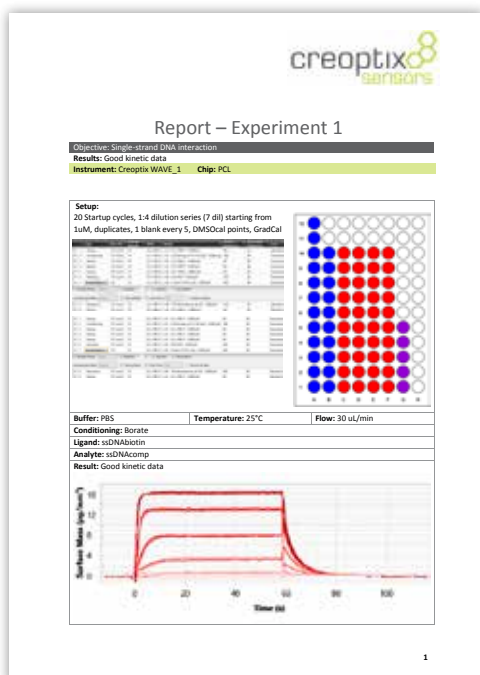


Ligand: Carbonic Anhydrase II (29 kDa)
Analyte: Methylsulfonamide (95.1 Da),
 $k_{\text{off}} = 2.79 \text{ sec}^{-1}$

Kinetics



WAVEsampler—Cooling for up to 768 samples.



- Unique disposable microfluidics cartridge can be changed in seconds—eliminating the need to call Field Service for replacement—and protects the sensor surface from contamination or damage.

- Microvalve-free design:

- eliminates the clogging problems of other systems, minimizing downtime.
- allows the study of samples such as membrane proteins without much time-consuming sample preparation or purification.
- enables kinetics in physiologically relevant conditions (e.g. 100% serum).
- provides a solution to reliably measure kinetics of large particles (e.g. viruses).

- Modern, intuitive interface mirrors your workflow for greater ease and efficiency.

- Powerful and customizable tools offer a never-before-seen level of flexibility, making it easy to:

- make adjustments and changes on the fly, or even stop and restart mid-stream.
- quickly set up experiments using built-in wizards or clone or copy established cycles from previous experiments.
- import and export data to and from Excel and other formats.
- integrate data into your existing LIMS using open XML-format files.
- use predefined or arbitrary customized evaluation models for kinetic fit.
- rapidly generate reports and editable Word files through an automated report generator.

GREATER INNOVATION. BROADER APPLICATION.

Designed for a wide array of label-free interaction analyses, WAVE's exceptional sensitivity and high resolution even at low signal levels make the system ideal for a variety of applications and sample types that may be difficult or impossible to run on other systems, including:

Fragment-Based Drug Discovery (FBDD)

With its unparalleled sensitivity and fast kinetics, WAVE supports and simplifies fragment-based screening, providing a platform that:

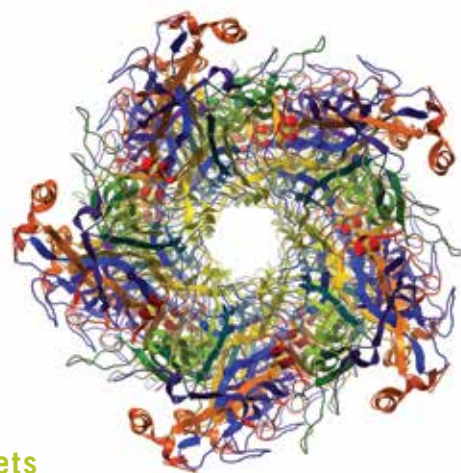
- Delivers high reproducibility and superior reliability even with large drug targets.
- Reliably resolves weak binders with off rates as fast as 5 sec^{-1} .
- Enables early stage selection of true positive hits.
- Screens 384 fragments in less than 15 hours.



Supernatants, serums, and formulation agents

WAVE's revolutionary microfluidics eliminates the clogging issues of other systems, expanding the instrument's analytical capabilities to include:

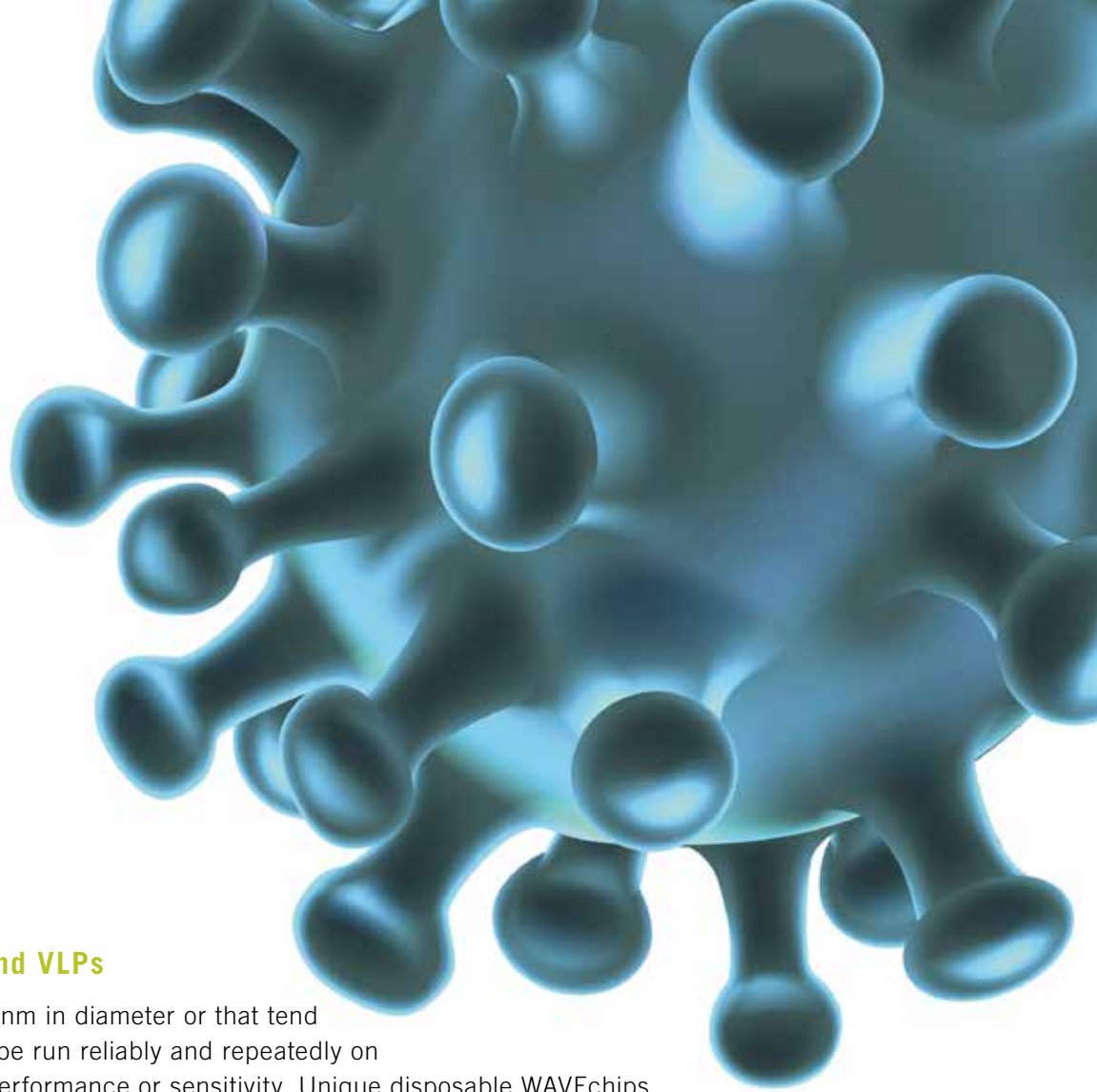
- Crude and unpurified samples.
- 100% blood serum.
- Cell culture supernatant.



Large drug targets

WAVE's high sensitivity enables the study of interactions at very low signal levels. For the first time ever, you can perform:

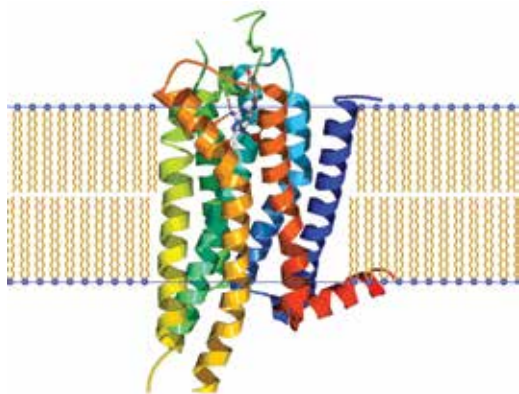
- Kinetics analyses of molecules with dramatically different size ratios.
- Reliable kinetics at R_{max} below 1 pg/mm^2 .



Viruses, liposomes, and VLPs

Large particles above 100 nm in diameter or that tend to clog other systems can be run reliably and repeatedly on WAVE with no impact on performance or sensitivity. Unique disposable WAVEchips combine sensor technology and robust microfluidics in a fully sealed cartridge that:

- Eliminates the risk of cross-contamination.
- Prevents user exposure to harmful samples.
- Ensures more reliable data by protecting the sensor from inadvertent handling.



Membrane proteins

So critical in the drug discovery process, membrane proteins can be analyzed on the WAVE system with very little up-front purification due to the instrument's robust, clog-free microfluidics. This unique capability gives you:

- A more physiologically relevant environment.
- More native membrane proteins for more reliable results.

RIDE THE WAVE TO YOUR NEXT DISCOVERY.

Better technology yields better results. It allows you to look deeper and explore wider. It lets you do things previously impossible, and see things previously invisible.

Avoid the limitations of SPR with a breakthrough system that expands the boundaries of label-free by offering:

- Exceptional sensitivity
- Fast kinetics
- Robust microfluidics

SPECIFICATIONS

General	
Noise (RMS)	<0.015 pg/mm ² @ 10 Hz
Drift	<0.3 pg/mm ² /min (channel-to-channel)
Readout frequency	10 or 40 Hz
Molecular weight	No lower limit
Association constant range	$k_a = 10^3 - 5 \times 10^7 \text{ M}^{-1} \text{ sec}^{-1}$ (small molecules) $k_a = 10^3 - 3 \times 10^9 \text{ M}^{-1} \text{ sec}^{-1}$ (large molecules)
Dissociation constant range	$k_d = 10^{-5} - 5 \text{ sec}^{-1}$
Sample refractive index range	1.0 – 1.8
Analysis temperature range	15 – 40 °C stabilized +/- 0.1 °C (max 5 °C below ambient)
Temperature range operation	15 – 35 °C

Chip Surface	
Surfaces	Carboxymethyl dextrane and other polymers with different length and charge densities, also NTA or streptavidin pre-coated (contact us for more details)

Fluidics	
Channels	2
Flow cells	Sealed, disposable, integrated into consumable
Flow rate	1 – 200 $\mu\text{l}/\text{min}$

Sample Handling	
Sample capacity	2x microtiter plates (96 or 384 well) or vial racks (48 position) or combinations thereof
Buffer	Up to 1x2000 ml running buffer
Injection volume	1 – 450 μl
Sample volume required	Injection volume plus 15 – 45 μl (application dependent)
Sample storage temperature	4 – 25 °C (max 20 °C below ambient)
Automation	Unattended operation for full sample capacity

Sample Requirements	
Serum compatibility	Up to 100%
Particle size	<1 μm in diameter

Standard Conformity	
IEC 61010 – 1:2010	Laboratory devices
IEC 60825	Laser safety
IEC 61326 – 1:2006	EMV requirements

For more details or to request a free on-site demo, please visit creoptix.com or get in touch using the contact information below.

Where will the WAVE take you?