



Octet Platform

Label-free, Real-time Dip & Read™ Assays for Protein Quantitation and Biomolecular Kinetics



The Octet Advantage

ForteBio's Octet® platform includes instruments, biosensors, reagents and assay kits for performing label-free, real-time protein quantitation and biomolecular binding kinetic analysis. The platform provides Dip and Read™ simplicity, high-quality, content-rich data, streamlined assay development workflows, and results in minutes rather than days. It performs comprehensive characterization across a broad range of applications, making it a valuable alternative to ELISA, HPLC and SPR-based analysis.

Octet systems quantify protein concentrations and monitor protein-protein and other biomolecular interaction kinetics (k_a , k_d and K_D), enabling informed research and development decisions earlier in the process, while their high throughput enables accelerated timelines. They can be used in early discovery, research, development, late-stage clinical trials and in manufacturing/QC efforts. The Octet platform's microfluidics-free Dip and Read format enables use of crude media and their high throughput enables antibody and small molecule fragment library screening.

Octet Platform Benefits

PERFORMANCE — Superior data quality, excellent reliability

- Label-free, real-time data
- Excellent correlation to HPLC
- Enhanced precision compared to ELISA
- Kinetic, affinity data comparable to SPR and calorimetry
- Analyze crude samples and difficult to process, sticky, or low-solubility analytes

SIMPLICITY — Easy to learn and operate

- Learn to use in under 2 hours
- Automated, walk-away assay format
- Microfluidics-free, no user maintenance or dedicated operators
- Broad range of off-the-shelf biosensors allows rapid assay setup
- Intuitive software for data acquisition and analysis

SPEED — Faster time to result, high throughput

- Quantitate 96 samples in as little as 15 minutes
- Screen up to 1,000 binding interactions in just 6 hours
- Multi-step ELISA assays in less than 3 hours
- 96- and 384-well microplate sample formats
- Automation-compatible systems

PRODUCTIVITY — Efficient, affordable workflow

- Develop assays in hours rather than weeks
- Crude sample tolerance eliminates purification steps
- Broad dynamic range reduces need for dilution, improves accuracy
- Regenerable biosensors can be reused multiple times
- Non-destructive testing allows full sample recovery and reuse
- Fewer reagents needed and low reagent consumption

One Platform, Many Applications

BROAD APPLICABILITY WITHIN THE DISCOVERY AND DEVELOPMENT PROCESS

RESEARCH	LEAD GENERATION/ OPTIMIZATION	PROCESS DEVELOPMENT	MANUFACTURING AND QC	PRE-CLINICAL AND CLINICAL
<ul style="list-style-type: none"> Characterization of binding kinetics Mechanism of action assays Rapid assay development Small molecule and fragment screening 	<ul style="list-style-type: none"> Kinetic screening of hybridomas Kinetic screening of phage libraries Epitope binning/mapping Affinity measurement/ranking Protein engineering studies 	<ul style="list-style-type: none"> Clone selection and ranking Protein expression monitoring Process optimization assays Biological activity assessment 	<ul style="list-style-type: none"> Production monitoring Contaminant detection Biocomparability for lot release Biological activity assessment Stability testing 	<ul style="list-style-type: none"> Kinetic profiling of immunotherapeutics Anti-drug antibody monitoring Pharmacokinetics Biomarker assays

ANTIBODY AND PROTEIN CONCENTRATION

The Octet platform performs rapid concentration analysis of antibodies and other proteins for expression library screening, upstream and downstream process development, biotherapeutic and biomarker quantitation assays.

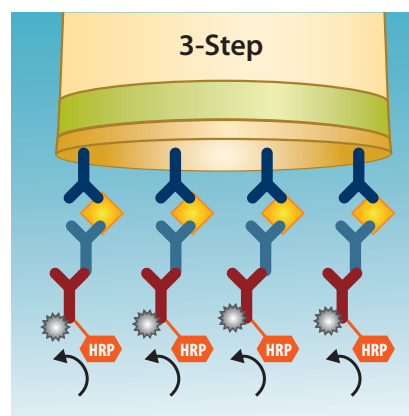
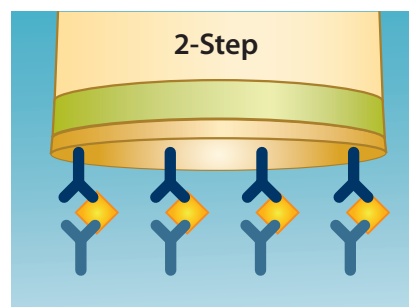
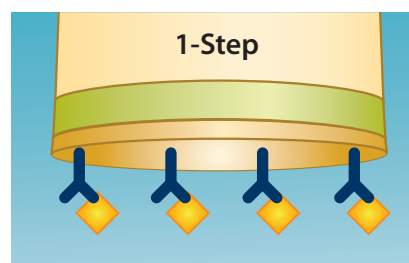
- Excellent correlation with HPLC data and superior precision over ELISA
- Analysis of 96 samples in as little as 15 minutes
- Direct binding assay format — no need for labeling or secondary reagents
- No laborious purification steps — test directly in crude samples such as cell culture supernatants
- User customizable biosensor choices

ELISA ASSAY DEVELOPMENT

The Octet platform provides walk-away autonomy, rapid time to results, improved precision and richer data quality than ELISA assays for measuring pharmacokinetics, and quantitating biotherapeutics and biomarkers.

- 2-step and 3-step assays for higher sensitivity
- Assay conditions can be optimized in hours rather than weeks via ELISA
- Assays complete in less than 3 hours start to finish — no overnight incubations
- Automated, no-wash assays reduce hands-on time and manual steps
- Real-time binding data provides more information than end-point ELISA
- Identify even weak affinity binding interactions often missed by ELISA

Octet Assay Formats

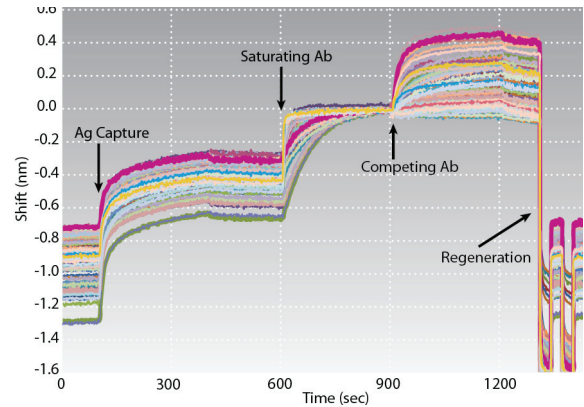


One Platform, Many Applications

FUNCTIONAL SCREENING AND CHARACTERIZATION

Octet systems provide fast and versatile methods for screening and characterization of monoclonal antibodies against antigens in crude samples. More informed decisions can be made earlier in the lead generation and lead optimization process, as well as in vaccine development and efficacy testing.

- Kinetic measurements of k_a , k_d and K_D for binding studies
- Wide affinity range from mM to pM measured
- Rapid affinity and off-rate ranking of crude antibodies — even in the presence of serum and cell culture impurities
- Efficient epitope binning — 34X34 interactions in 6 hours
- Parallel, independent array of 16 biosensors probing samples in 96- and 384-well microplate format allows immense versatility
- Reliable binding kinetics measured for membrane proteins and virus-like particles

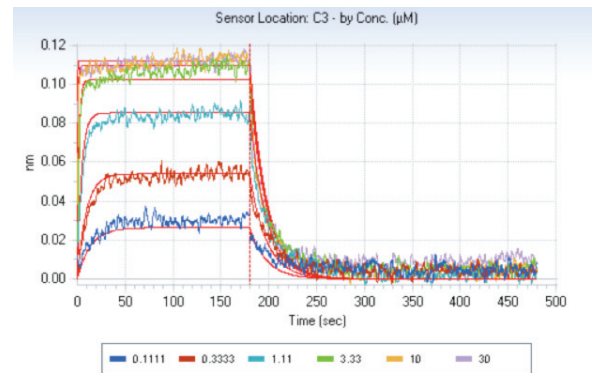


Fast binning of many antibodies accomplished by In-tandem binning. 192 antibody pairs were screened in a 16 X 12 matrix in five hours.

SMALL MOLECULE ANALYSIS AND FRAGMENT SCREENING

The rapid data acquisition capabilities of the Octet platform enable high-sensitivity analysis of low molecular weight molecules with fast interaction rates for hit-to-lead assays and fragment screening.

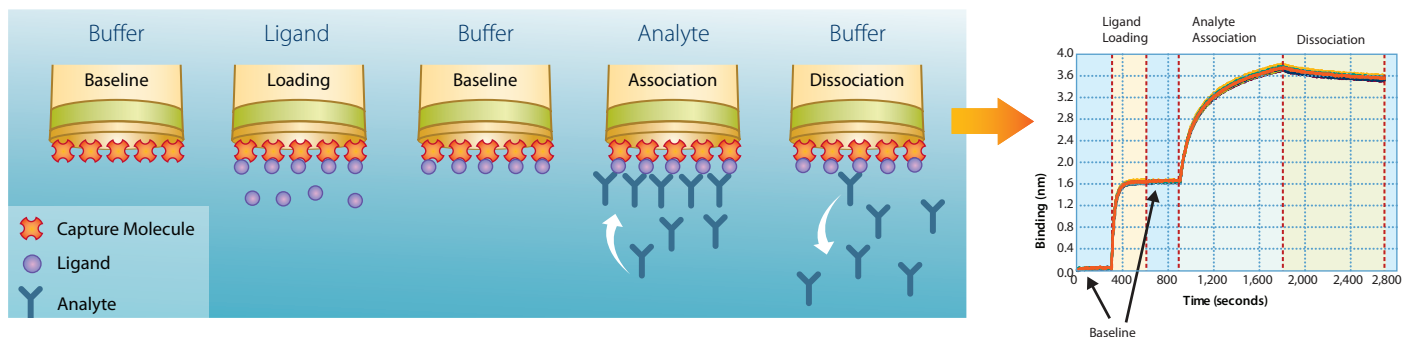
- Label-free detection of small molecule fragments 150 Da and higher
- High quality kinetic information including k_a , k_d , kinetic and steady-state K_D
- Rapid library screening — more than 1,000 fragments screened in 8 hours
- No need for solvent correction — Octet systems tolerate typical changes in DMSO concentration
- Versatile software simplifies data analysis and streamlines throughput



Octet Dip and Read™ Workflow

Up to 16 independent biosensors dip into 16 individual samples in 96-well or 384-well microplates to provide rapid and highly parallel processing of small to large sample sets. This Dip and Read workflow also provides much greater flexibility in configuring assay formats.

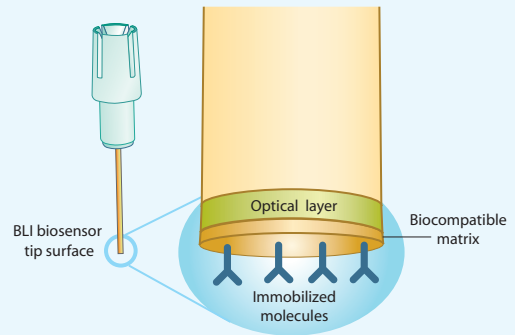
KINETIC ASSAY STEPS



Bio-Layer Interferometry

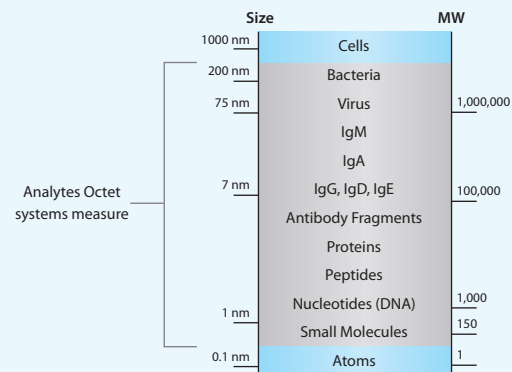
Dip and Read™ Biosensors

Octet biosensors use a proprietary biocompatible matrix that is uniform, non-denaturing, and engineered for minimal non-specific binding. A large variety of biosensor chemistries are available for off-the-shelf use. Additionally, some biosensors, including Streptavidin and Amine-reactive, are user-customizable for individual applications. Octet biosensors may be disposed after one use, or, may be regenerated for multiple uses. The ability to regenerate is influenced by the molecules loaded on the biosensor and the regeneration buffer.



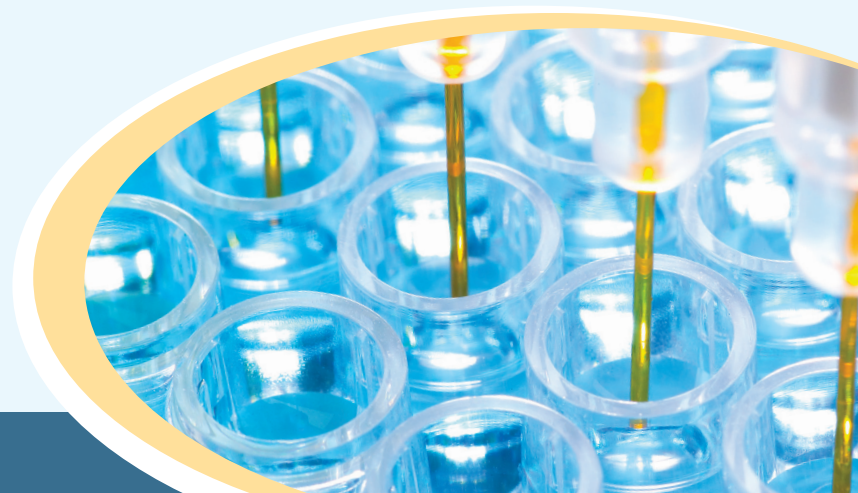
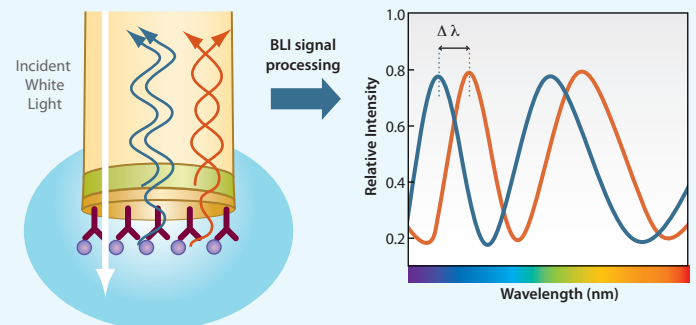
BLI Advantages

- High-quality data for protein and small molecule analysis
- Direct binding assays eliminate labeling and secondary reagents
- Real-time monitoring enables kinetic analysis of binding interactions
- Detects analyte binding with excellent specificity, even in crude samples
- Measures a wide range of analytes

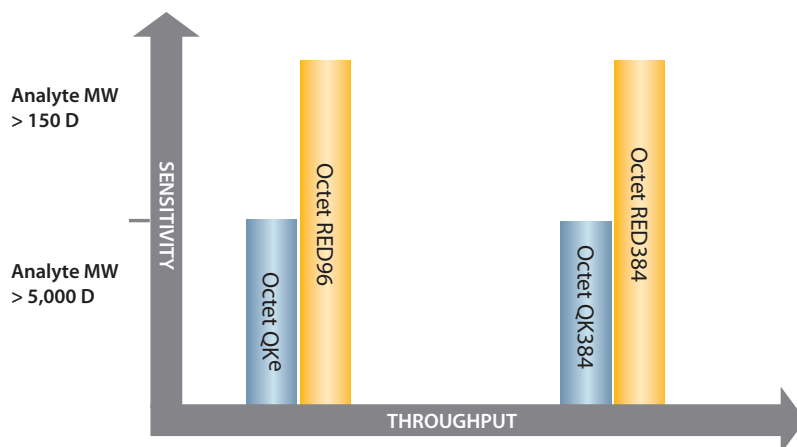


Basic Principles

Octet systems incorporate Bio-Layer Interferometry (BLI), a label-free biosensor technology, to provide high-value, real time information on protein interactions. The instrument emits white light down the biosensor and collects the light that is reflected back. These reflected wavelengths are affected by the thickness of the coating on the optical layer, some wavelengths show constructive interference (blue), others destructive interference (red). This interference is captured by a spectrometer as a unique spectral signature, reported in relative intensity units (nm). Any change in the number of molecules bound to the biosensor tip causes a shift in the interference pattern that can be measured in real time. The wavelength shift is a direct measure of the change in optical thickness (nm) of the biological layer.



Octet System Choices



- 96-well plates
- 1 sample plate position
- 8-channel readout
- Biosensor re-racking

- 96- and 384-well plates
- 2 sample plate positions
- 16-channel readout
- Automated plate handling
- Biosensor re-racking
- $\geq 40 \mu\text{L/well}$ (384TW microplate)*

*The 384TW microplate is a black, polypropylene, 384-well tilted bottom plate designed for use on the Octet RED384 and Octet QK384 instruments. The 384TW microplate enables use of sample volumes as low as $40 \mu\text{L}$, reduces background signal variability and improves assay sensitivity.

Label-Free Kinetic Characterization

All Octet instruments provide sample temperature control from 4°C above ambient up to 40°C in 1°C increments. The kinetic constant measurement ranges are system- and assay-dependent. A typical range for each system is shown below.



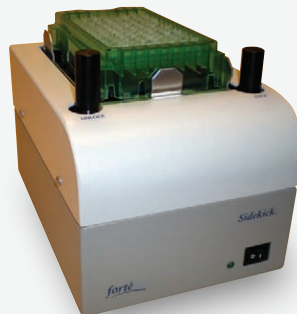
OCTET SYSTEMS KINETIC CONSTANT RANGES

Application	Specification	Octet RED384	Octet QK384	Octet RED96	Octet QKe
Protein-Protein Kinetics	$k_a, \text{M}^{-1}\text{s}^{-1}$	$10^2 - 10^7$	$10^3 - 10^7$	$10^2 - 10^7$	$10^3 - 10^7$
	k_d, s^{-1}	$10^{-6} - 10^{-1}$	$10^{-6} - 10^{-1}$	$10^{-6} - 10^{-1}$	$10^{-6} - 10^{-1}$
	K_D, M	1 mM – 10 pM	0.1 mM – 10 pM	1 mM – 10 pM	0.1 mM – 10 pM
Protein-Small Molecule Kinetics	$k_a, \text{M}^{-1}\text{s}^{-1}$	$10^2 - 10^7$	N/A	$10^2 - 10^7$	N/A
	k_d, s^{-1}	$10^{-6} - 10^{-1}$	N/A	$10^{-6} - 10^{-1}$	N/A
	K_D, M	1 mM – 10 pM	N/A	1 mM – 10 pM	N/A
Data Acquisition Rate Options	Data points per second (Hz)	2, 5 and 10 Hz	0.3 and 0.6 Hz	2, 5 and 10 Hz	0.3 and 0.6 Hz

Octet Platform Accessories

Sidekick™ Biosensor Immobilization Station

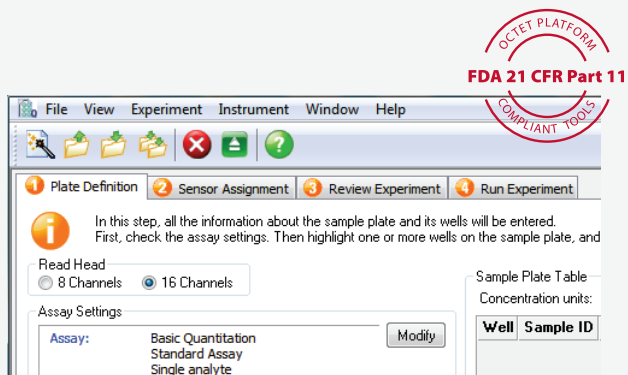
The Sidekick station enhances the throughput of your Octet assay by enabling incubation of 96 biosensors in 96 reagent or sample wells simultaneously. Loading of capture molecule and other incubation steps in which online signal monitoring is not needed can be performed offline on the Sidekick at higher throughput (all 96 in parallel), enhancing time-to-result in your Octet assays.



Octet Software

ForteBio's Octet software provides an intuitive, stepwise interface for data acquisition and analysis. In under two hours, a novice can start running quantitation and kinetic assays with confidence. Powerful curve-fitting tools provide concentration, affinity and rate constant information in a few mouse clicks. Experiment methods can be saved as protocols and re-used for subsequent runs, and any number of experiments or sample plates can be analyzed simultaneously.

For more information, download the Octet software datasheet from fortebio.com.



Validation and GLP Compliance

ForteBio offers optional 21 CFR Part 11 compliant software tools and instrument qualification to support validation of Octet systems in regulated environments. The 21 CFR Part 11 compliant Octet software provides user authorization levels and audit trails, and ensures data integrity. Instrument qualification support includes IQOQ documentation and service as well as instrument performance certification and on-site service.

Automation

Octet RED384 and QK384 systems employ an open architecture that enables integration with robotic systems. Octet instrument door and plate stage movements are amenable for control by robot software. Experimental method files can be invoked and run on the Octet system by robot software, enabling complete automation of all functions for running assays that involve multiple trays and plates. Octet systems have been integrated with many robotic platforms — visit fortebio.com for more information.



The Octet Family — A Complete Solution

SYSTEMS AND FEATURES

	Analyte MW (Kinetics)	Channels	96-Well Format	384-Well Format	Minimum Assay Volume	Plate Positions	Biosensor Re-racking	Automation-Friendly
Octet RED384	> 150 D	16	✓	✓	40 µL	2	✓	✓
Octet QK384	> 5 kD	16	✓	✓	40 µL	2	✓	✓
Octet RED96	> 150 D	8	✓	—	200 µL	1	✓	—
Octet QK ^e	> 5 kD	8	✓	—	200 µL*	1	✓	—

*Use of 80–120 µL assay volumes in half-area 96-well microplates on the Octet QK^e system at user's discretion.

DIP AND READ BIOSENSORS

Biosensor Type	Required Capture Molecule	Analyte Measured Using Biosensor	Targeted Application
Anti-hlgG-Fc	None	hlgG, human Fc-fused proteins	Q
Anti-mlgG-Fv	None	mlgG, rat IgG, mouse-Fab, rat Fab	Q
Protein L	None	Most mouse, rat, human IgG and Fab	Q
Protein A	None	Many human and other IgG types	Q
Protein G	None	Many murine and other IgG types	Q
Anti-Penta-HIS (HIS)	None	His-tagged proteins, peptides	Q
Streptavidin (SA)	Biotin-tagged peptides, oligos, proteins	Proteins, peptides, oligos	Q, K
Super Streptavidin (SSA)	Biotin-tagged peptides, oligos, proteins	Peptides, small molecules	K
Amine Reactive Second-Generation (AR2G)	Proteins, peptides, oligos	Proteins, antibody fragments	K
Anti-hlgG-Fc Capture (AHC)	hlgG, human fc fusion protein	Proteins, peptides, antibody fragments	K
Anti-mlgG-Fc Capture (AMC)	mlgG, mouse fc fusion protein	Proteins, peptides, antibody fragments	K
Aminopropylsilane (APS)	Proteins, peptides	Proteins, peptides	K

Biosensors qualified for use in: Q – Quantitation; K – Kinetics. Use outside targeted application at user's discretion

DIP AND READ ASSAY KITS

Assay	Item	Comments
Immunogenicity	Kit	Bridging and direct assay formats to detect high- and low-affinity anti-drug antibodies
Residual Protein A Detection	Kit	Protein A and biosimilars such as MabSelect SuRe
Host Cell Protein	Method	Generic and process-specific assays

Ordering

All Octet Systems come complete with a computer, monitor and software. To request a quote or place an order, please call 1-888-OCTET-75 or visit www.shop.fortebio.com. ForteBio offers online shopping for USA customers.



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