



FortéBio

# Octet Assay Systems

Superior performance, unrivaled flexibility



# Dip and Read™ Assays

## Robust, trouble-free interaction analysis

### *Analyze your toughest samples*

Our unique Dip and Read assay format handles crude, unpurified samples with ease. Study molecular interactions and binding kinetics in real-world samples that just can't be run on microfluidics-based platforms.

- Analyze unfiltered cell culture supernatants and lysates
- Study molecular interactions in biologically-relevant environments
- Straightforward avidity analysis of viruses and virus-like particles

### *Perfect for multiuser environments*

Octet systems are known for their reliable, trouble-free operation and have quickly become the go-to systems at both academic and industrial core facilities because of their ease of use and application flexibility.

- Low maintenance, no need for dedicated operators
- Learn to use in two hours or less
- Full menu of biosensors enables unconstrained exploration

### *Label-free simplicity*

Our Dip and Read biosensor technology enables direct determination of active protein concentrations with tight CVs and a broad dynamic range, without the need for expensive detection reagents.

- Quantitate 96 samples in as little as 2 minutes
- Excellent data correlation with HPLC and ELISA
- No pre-analysis purification steps needed

### *Boost your productivity*

All Octet systems offer intuitive workflows and walk-away automation to accelerate your research programs. Octet 96- and 384-well format instruments all use identical biosensors, letting you transfer methods worldwide with confidence.

- Develop assays in hours, not weeks
- Powerful screening applications for mAb selection and optimization
- Run 384-well plates in as little as 15 minutes



# Powerful Research Platform

## Answer your toughest research questions

Your research should be guided by your imagination, not by the limitations of your label-free system. The Octet platform's flexible, open-format design and comprehensive menu of biosensors lets you attack research challenges in unique new ways. Perform truly comprehensive structure/function studies with large panels of structural variants.

### *Antibody and antibody fragment characterization*

- Determination of  $k_a$ ,  $k_d$  and  $K_D$  for antibody-antigen binding
- Affinity and off-rate ranking in crude supernatants
- Antibody engineering and affinity maturation

### *Protein-protein and protein-peptide interactions*

- Structure/function and mechanism-of-action studies
- Kinetic analysis of panels of structural variants
- Wild-type versus mutant analysis

### *Protein DNA/RNA interactions*

- Transcription factor interaction studies
- RNA regulation by RNA binding proteins
- Translational control mechanisms

### *Protein-lipid interactions*

- Protein-liposome interactions
- Kinetic analysis of membrane proteins

### *Virus and vaccine research*

- HIV envelope protein research
- Evolution of virus binding selectivity
- Antiviral antibody development

### *Protein-small molecule interactions*

- Label-free detection down to 150 Da
- Binding constants including  $k_a$ ,  $k_d$  and  $K_D$
- Rapid label-free library screening



# Biopharm Workhorse

## Target identification and validation

Real-time binding data provide unique insights into the specific molecular interactions that regulate cellular processes, and can help pinpoint the aberrant molecular interactions that lead to pathway dysregulation and ultimately to disease. The Octet platform's 96-well and 384-well plate configurations let you rapidly run comprehensive structure/function investigations, including large kinetic screens of panels of structural variants.

- Probe cell signaling control mechanisms
- Dissect ligand/receptor interactions
- Discover novel therapeutic targets

## Lead identification

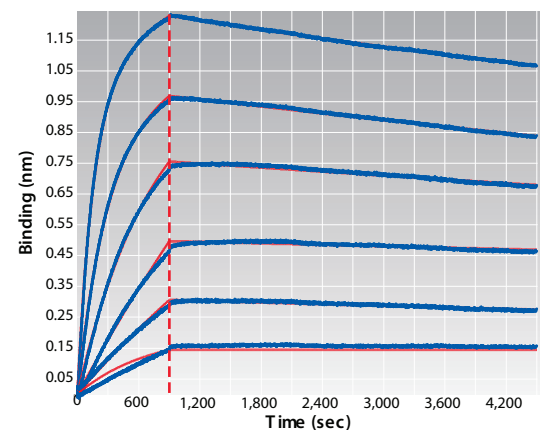
Octet systems let you perform screening-based lead identification, whether the samples are derived from primary hybridoma hits or from phage display libraries. Early identification of candidates with promising affinities and dissociation kinetics helps avoid later-phase failures caused by non-ideal binding characteristics.

- Unmatched throughput for screening campaigns
- Kinetic screening and off-rate ranking
- Direct kinetic profiles from crude samples
- Advanced tools for epitope binning in unpurified samples

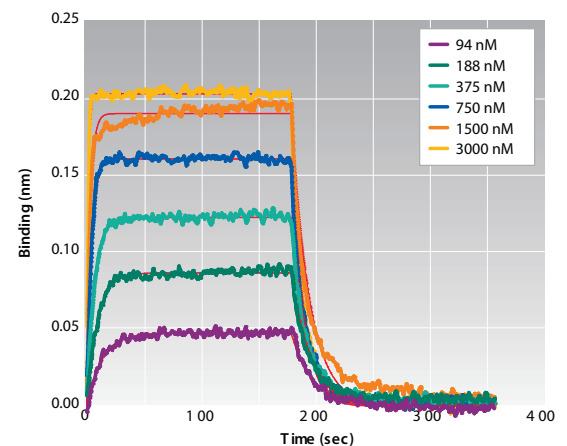
## Lead optimization

Label-free kinetic characterization data provide key insights that help drive your drug optimization process and guide the evolution of secondary screening hits into true lead candidates. Octet systems dramatically accelerate protein engineering studies by providing detailed kinetic profiles, expert data analysis tools, and walk-away automation.

- Affinity engineering and maturation
- Engineering of Fc receptor binding profiles
- Tools for epitope binning and mapping



**Large Molecule Kinetics.** Affinity and binding rate constants can be determined by running an analyte concentration series. Octet software provides a selection of data fitting models to accommodate both simple and complex binding interactions.



**Small Molecule Kinetics.** Octet K2, Octet RED96e, Octet RED384 and Octet HTX systems combine rapid data acquisition and high sensitivity detection to enable label-free kinetic analysis of small molecule-protein binding interactions.



# Accelerating Biopharmaceutical Development

## Cell line development

Traditional titer determination techniques create bottlenecks during process optimization due to long analysis times, lack of specificity, and labor-intensive protocols. Octet systems accelerate upstream process optimization by offering rapid assay development, exquisite specificity, and full-plate quantitation in record time.

- Full-plate titer determination in as little as 5 minutes
- Optimize media and growth conditions
- Excellent data correlation with HPLC and ELISA
- Glycosylation profiling in cell culture supernatants

## Pharmacokinetics & pharmacodynamics

High detection sensitivity, a wide dynamic range, and streamlined workflows that shave hours or even days from standard processes make the Octet system a compelling alternative to ELISA for pharmacokinetic and pharmacodynamic studies. Anti-drug immune responses can be precisely characterized in serum samples, providing a detailed profile of antibody isotype, specificity, and affinity.

- Detection of immune response
- Antibody isotype, specificity and affinity
- Perfect for low-affinity ADAs

## Process development

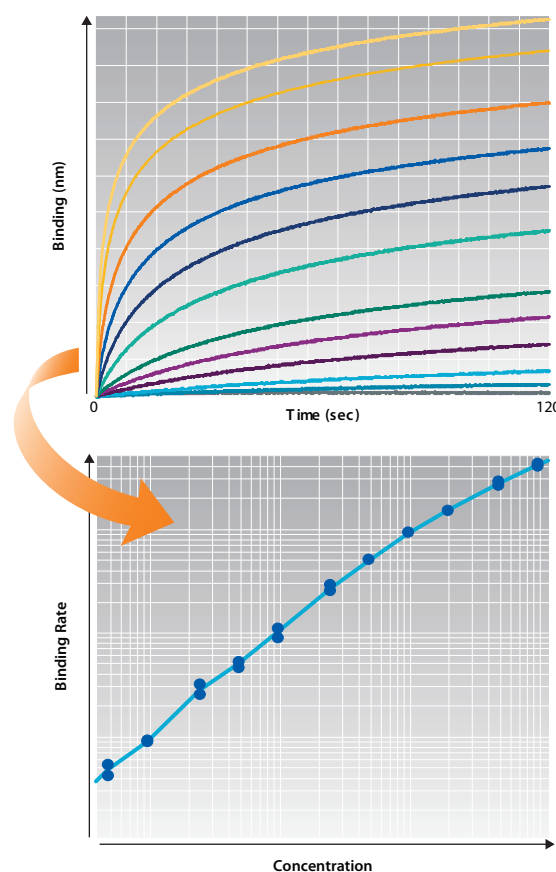
Octet assays significantly speed downstream process development and optimization studies, enabling rapid quantitation of protein products and process-related impurities at multiple in-process points.

- Monitor column flow-through for dynamic binding capacity studies
- Optimize binding and elution conditions
- Ultrasensitive detection of contaminant testing including host cell proteins and residual Protein A

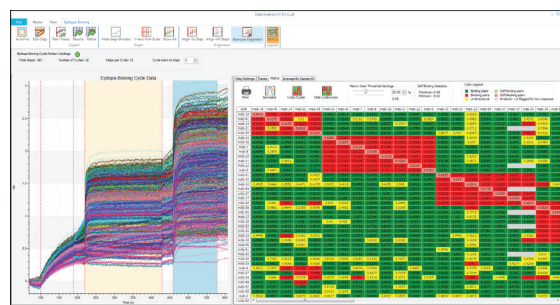
## Manufacturing and quality control

Monitor protein activity, stability, and impurity profiles throughout your downstream processing - right down to the final product. Octet software and systems tools enable seamless transfers to GxP environments.

- Characterize biopharmaceutical activity and binding kinetics
- Monitor potency and stability
- Ideal orthogonal technique for cell-based studies









**Protein Quantitation.** The Octet system's Dip and Read format allows direct quantitation of mAbs and other proteins. A standard curve is generated using known analyte concentrations, and unknown sample concentrations are interpolated from the standard curve.



**Epitope Binning.** Powerful epitope binning data analysis tools enable easy visualization of large data sets. Automatically find the binning cycle pattern, assign Antibody 1 and Antibody 2, and create a traffic-light matrix.

# Choosing Your System

The Octet family of instruments is designed to meet a broad range of application and workflow requirements. Your local Pall ForteBio representative can provide detailed information on system capabilities and our extensive library of Octet application solutions to help you choose the system that's right for your lab.

	 Octet K2 System	 Octet QK6 System	 Octet QK384 System	 Octet RED96e System	 Octet RED384 System	 Octet HTX System
	Research-friendly small and large molecule characterization	Automated large molecule characterization	High throughput large molecule characterization	Automated small and large molecule characterization	High throughput small and large molecule characterization	Highest throughput small and large molecule characterization
<b>Applications*</b>						
Small Molecule Assays	●			●●	●●●	●●●
VLP assays	●	●	●●	●●	●●	●●●
Screening Applications		●	●●	●	●●	●●●
Protein interaction Kinetic Analysis	●●	●●	●●	●●●	●●	●●
Measuring Weak Binding Affinities	●●	●	●	●●	●●	●●
Measuring Tight Binding Affinities	●●	●	●	●●●	●●	●●
Determining Antibody Titer	●	●●	●●●	●●	●●●	●●●
Multi-step Quantitation assays	●	●●	●●	●●	●●●	●●●
<b>Performance</b>						
Maximum Simultaneous Reads	2	8	16	8	16	96
Molecular Weight	>150 Da	>5,000 Da	>5,000 Da	>150 Da	>150 Da	>150 Da
On-rate ( $k_{on}$ ) Range ( $M^{-1}s^{-1}$ )	$10^1 - 10^7$	$10^2 - 10^5$	$10^2 - 10^5$	$10^1 - 10^7$	$10^1 - 10^7$	$10^1 - 10^7$
Off-rate ( $k_{off}$ ) Range ( $s^{-1}$ )	$10^{-6} - 10^{-1}$	$10^{-5} - 10^{-2}$	$10^{-5} - 10^{-2}$	$10^{-6} - 10^{-1}$	$10^{-6} - 10^{-1}$	$10^{-6} - 10^{-1}$
Affinity ( $K_D$ ) range	1mM – 10 pM	0.1mM – 0.1nM	0.1mM – 0.1nM	1mM – 10 pM	1mM – 10 pM	1mM – 10 pM
Evaporation Control	No	No	No	Yes	No	No
Minimum Sample Volume	200 $\mu$ L	100 $\mu$ L†	40 $\mu$ L**	200 $\mu$ L	40 $\mu$ L**	40 $\mu$ L**
Acquisition Rate	2, 5, 10 Hz	0.3, 0.6 Hz	0.3, 0.6 Hz	2, 5, 10 Hz	2, 5, 10 Hz	0.3, 0.6, 2, 5, 10 Hz
<b>Specifications</b>						
Number of Spectrometers	2	1	2	8	16	16
Temperature Control	Ambient +4°C – 40°C	Ambient +4°C – 40°C	Ambient +4°C – 40°C	15°C – 40°C	Ambient +4°C – 40°C	Ambient +4°C – 40°C
Microplate Positions	1 (96-well)	1 (96-well)	2 (96- or 384-well)	1 (96-well)	2 (96- or 384-well)	2 (96- or 384-well)
Integration with Automation	No	No	Yes	No	Yes	Yes
<b>Dimensions</b>						
Size H x W x D (cm)	47 x 43 x 53	47 x 43 x 53	77 x 80 x 80	49 x 56 x 46	77 x 80 x 80	77 x 80 x 80
Weight (Kg)	26.3	23	68.2	32.7	68.2	90

\* ● means applications can be performed in the instrument, ●● and ●●● refer to higher throughput and ideal instrument to perform the specific application

\*\* In a 384-well tilted-bottom microplate (Pall ForteBio, part no.18-5080)

† In a 96-well half-area microplate (VWR, part no. 82050-044)

# Biosensors for Flexible Assay Design

Dip and Read biosensors are coated with a uniform, non-denaturing biocompatible matrix that provides minimal non-specific binding, even in crude, unfiltered samples. Our broad range of surface chemistries lets you design experiments with maximum flexibility.

Biosensor	Description	Intended Application <sup>1</sup>	Best Used For	Quantitation Dynamic Range <sup>2</sup>		
				QK*/QK384	K2/RED96e/RED384	Octet HTX
APS	Amino-Propyl-Silane	K	Binding measurement of lipids, liposomes, hydrophobic proteins that don't have other methods of surface attachment	N/A	N/A	N/A
AR2G	Amine Reactive 2G	K	Covalently immobilizing any molecule with a terminal amine group for all kinetic analyses	N/A	N/A	N/A
SSA	Super Streptavidin	K	Small molecule and fragment analysis	N/A	N/A	N/A
AHC	Anti-Human Fc-Capture	K	Capturing human IgG's or human Fc-fusion proteins for kinetic analysis	N/A	N/A	N/A
AMC	Anti-Mouse Fc-Capture	K	Capturing mouse IgG's or mouse Fc-fusion proteins for kinetic analysis	N/A	N/A	N/A
SA	Streptavidin	K	Immobilizing biotinylated molecules for all kinetic analyses	N/A	N/A	N/A
SAX	High Precision Streptavidin	Q and K	Immobilizing biotinylated molecules for quantitation and kinetics analyses			
AHQ	Anti-Human IgG Fc	Q	Quantitation measurements of human IgG's or human Fc-fusion proteins	0.5–100 µg/mL	0.025–200 µg/mL	0.025–200 µg/mL
AMQ	Anti-Murine IgG Fv	Q	Quantitation measurements of mouse IgG's or mouse F(ab') <sub>2</sub>	0.5–100 µg/mL	0.1–200 µg/mL	0.1–200 µg/mL
HIS1K	Anti-Penta HIS	Q and K	Quantitation of HIS-tagged proteins, direct capturing of HIS-tagged proteins for kinetic analysis	Protein and protocol dependent, 0.1–500 µg/mL	Protein and protocol dependent, 0.1–500 µg/mL	Protein and protocol dependent, 0.1–500 µg/mL
HIS2	Anti-Penta-HIS 2G	Q	Quantitation of HIS-tagged proteins in crude matrices or buffer or column eluent	Protein and protocol dependent, 0.1–200 µg/mL	Protein and protocol dependent, 0.1–200 µg/mL	Protein and protocol dependent, 0.1–200 µg/mL
ProA	Protein A	Q	Quantitation of IgG's of various species including human	0.1–700 µg/mL	0.025–2000 µg/mL	0.025–2000 µg/mL
ProG	Protein G	Q	Quantitation of IgG's of various species including human	0.1–700 µg/mL	0.025–2000 µg/mL	0.025–2000 µg/mL
ProL	Protein L	Q	Quantitation of IgG's of various species via the kappa light chain	0.1–700 µg/mL	0.05–2000 µg/mL	0.05–2000 µg/mL
FAB2G	Anti-Hum Fab-CH1 2nd Generation	Q and K	Quantitation of human Fab and IgG. Kinetic analysis of Fab fragments and IgG with target antigen, Fc receptors, or other analytes	Analyte dependent, typically 0.5–1000 µg/mL	Analyte dependent, typically 0.5–1000 µg/mL	Analyte dependent, typically 0.5–1000 µg/mL
GST	Anti-GST	Q and K	Quantitation of GST-tagged proteins, direct capturing of GST-tagged proteins for kinetic analyses	Protein dependent, typically 0.1–2000 µg/mL	Protein dependent, typically 0.1–2000 µg/mL	Protein dependent, typically 0.1–2000 µg/mL
NTA	Ni-NTA	Q and K	Quantitation of HIS-tagged proteins in buffer or diluted matrix, capturing of HIS-tagged proteins for kinetic analyses	Protein dependent, typically 0.5–1000 µg/mL	Protein dependent, typically 0.5–1000 µg/mL	Protein dependent, typically 0.5–1000 µg/mL

1 Biosensors are developed, manufactured and tested specifically for kinetic assays (K), quantitation assays (Q), or both. Use of biosensors outside their intended purpose requires user validation.

2 Dynamic range may vary. Listed values are provided as guidelines only and are based on testing of specified analyte molecules. Users should validate the dynamic range for their specific analyte/sample.

## Ready BLI Detection Kits

Assay	Item	Comments
Residual Protein A Detection	Kit	Protein A and biosimilars such as MabSelect SuRe
Anti-CHO HCP Detection Kit	Kit	Rapid, high throughput detection of CHO host cell proteins

Learn more at  
[www.fortebio.com](http://www.fortebio.com)

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