Octet® Real-Time Drug and Protein Binding Kinetics Unit

Contact Information

The ForteBio Octet® RED384 system is located in 3006 Veterinary Medicine Research Facility 3B (VM3B).

For questions or to get started, please contact unit director Alexey Tomilov, PhD, at atomilov@ucdavis.edu.

Or call 530-902-1051

Equipment Description and Usage Service

The ForteBio Octet® RED384 equipment is available for recharge use at the UC Davis Octet® Real-Time Drug and Protein Binding Kinetics Unit. The Octet system provides researchers the opportunity to perform high-throughput, real-time, drug-protein and protein-protein binding kinetics in an expedited manner compared to traditional techniques. This machine is a relatively new technological advancement and is one of few available for use at any university campus.

The Octet® system provides many advantages over traditional methods for detecting drug-protein and protein-protein interactions. The high-throughput aspect of the system means that a library of small molecules or known proteins can be screened for interaction with a protein of interest both quickly and at large scale. The BioLayer Interferometry (BLI) Technology provides real-time protein-small molecule or protein-protein association and dissociation kinetics. The high sensitivity of the assay means that much lower protein amounts are required for analysis compared to traditional immunoprecipitation, NMR, or ELISA methods. In addition, crude protein extracts may be used, and the Octet® system has considerable flexibility to work with both labeled and non-labeled protein targets.

ForteBio Octet® RED384 Instrument

Adapted from Octet® RED384 product manual:

http://www.fortebio.com/bli-technology.html

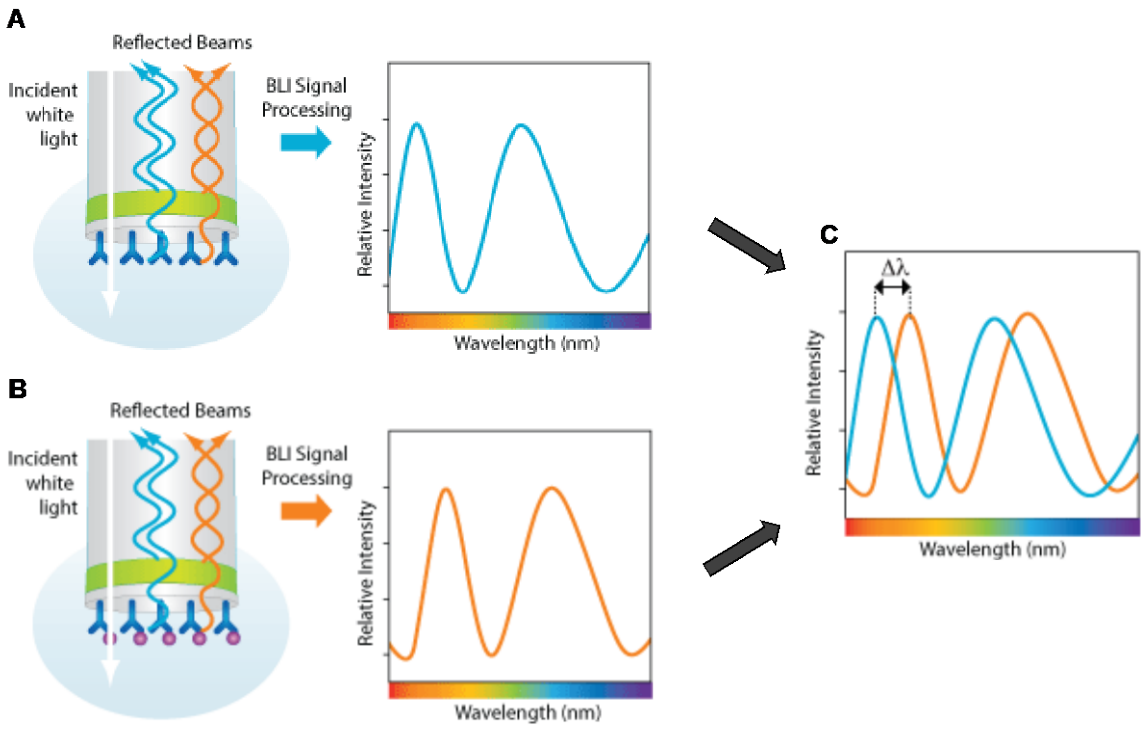
Bio-Layer Interferometry (BLI) Technology

BLI is an optical analytical technique that measures interference patterns between waves of light (**Figure 1**). White light is directed down a fiber-optic biosensor towards two interfaces: an internal reference layer (**Figure 1A**), and a biocompatible layer on the surface of the tip (**Figure 1B**). A thin layer at the tip of the fiber separates these interfaces. Light reflects from each of the two layers, and the reflected beams interfere constructively or destructively at different light spectrum wavelengths; a CCD array detector measures this interference pattern.

Target molecules bind to the two-dimensional coated surface when the tip of a biosensor is dipped into a sample. This molecular layer increases in thickness when more target molecules bind to the surface. As the thickness of the layer increases at the biosensor tip, the effective distance between the two reflective layers increases, creating a shift in the interference pattern of reflected light (**Figure 1C**). The spectral pattern of the reflected light therefore changes as a function of the molecular layer optical thickness, i.e. the number of molecules bound to the biosensor surface. This spectral shift is

monitored at the detector and reported as a change of wavelength (Response [nm] shift) on the Octet® sensorgram.

Figure 1



Adapted from ForteBio BLI Technology:
http://www.fortebio.com/bli-technology.html

ForteBio Octet® RED384 Instrument Software

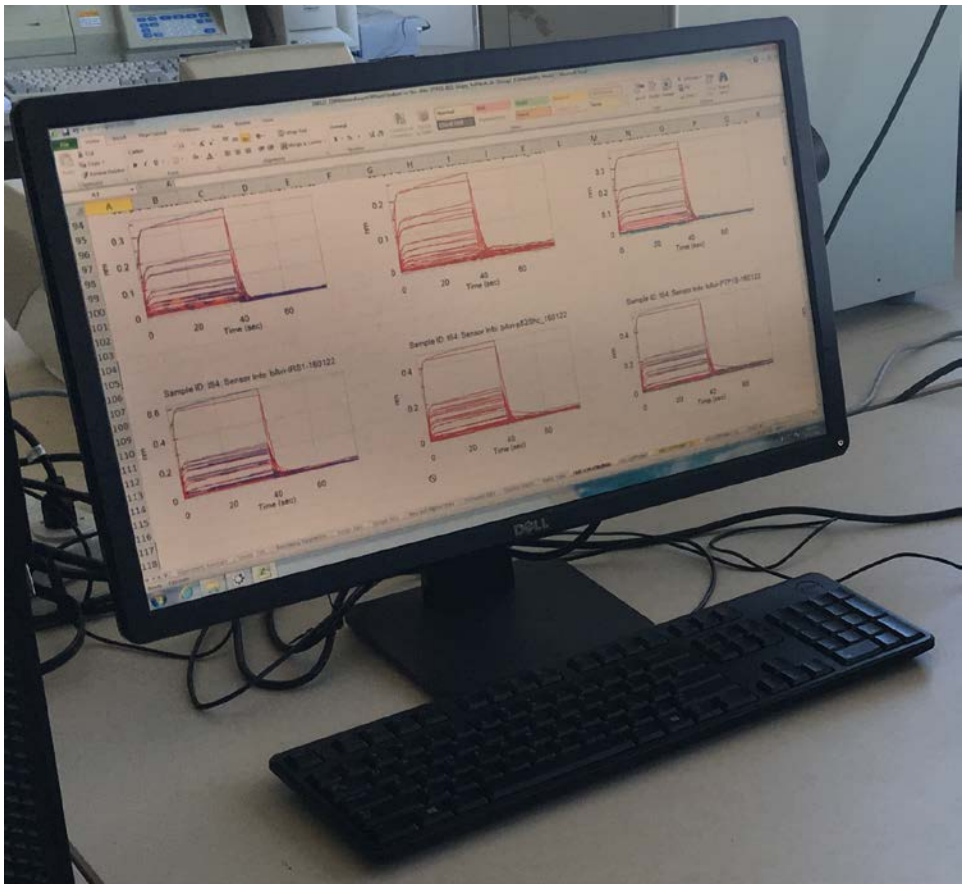
Please visit the Octet® RED384 manufacturer website for information regarding available data analysis software packages:

http://www.fortebio.com/octet-software.html

ForteBio Octet® RED384 Instrument Recharge Rates

$129/hour for UCD on-campus users
$171/hour for external users

Above: Unit director Alexey Tomilov, PhD, stands in front of the Octet® RED384 instrument.



Above: This image shows Octet® RED384 analyzer sensorgram output of a small molecule binding to proteins of interest.