**FEB Technology**

Field Effect Biosensing (FEB) is an all-electronic technology for measuring biomolecular interactions. This label-free technique measures the current across a field effect biosensor surface to which capture molecules are immobilized (Image 1). Any interaction or binding that occurs on the surface causes a change in conductance that is monitored in real-time (Image 2).

The binding between a capture molecule immobilized on the biosensor surface and a target analyte in solution causes current and/or capacitance to increase or decrease, which is directly output in a sensorgram (Image 3). This real-time measurement enables accurate monitoring of binding affinity, kinetics (including association and dissociation binding rates), and concentration.

Only molecules binding to or dissociating from the biosensor surface cause a change in conductance on the AGILE platform. Unbound molecules, crude media that might interfere with optics, or changes in flow rate do not affect the conductance reading. These distinctive features enable detection in complex samples such as cell and tissue lysate, blood fractions, or in up to 10% DMSO, making FEB an efficient technology for small molecule or protein lead discovery, and antibody characterization and development.

**Borrelia Burgdorferi Direct Detection**

Lyme disease (LD) is the most common vector-borne disease in the United States and Europe, presenting a growing health care problem. The number of LD cases in the US increased by approximately 200% in the last 2 decades, and recent CDC studies suggest that around 300,000 people in the US are diagnosed with LD every year. AGILE R100 successfully detected recombinant antigen in PBS binding to *Borrelia burgdorferi* (Bb) monoclonal antibody immobilized on the biosensor surface. Using built-in automated software, kinetics were fit to measure $k_0$.

With immobilized polyclonal Bb antibodies, AGILE R100 detected various concentrations of lyzed Bb cells from 10 ng/ml to 200 ng/ml in 1X PBS with 1% BSA. Every AGILE biosensor chip is built with graphene transistors which provide a minimum of 10 replicates per measurement for strong internal reproducibility and technical control. The thick blue line below is the average measurement response and the light blue shading represents the standard deviation.

**AGILE R100**

Built on proprietary FEB technology, AGILE R100 is a benchtop label-free assay that provides sensitive, real-time binding kinetics and concentration data. Leveraging inert graphene material, AGILE R100 provides fast responses in a broad range of fluids. Unlike optical systems, this electronic technology can detect small molecules and fragments with no lower size limit in up to 10% DMSO without double referencing. The benchtop device uses as little as 10 μL, putting you in charge of analyzing challenging samples in your own lab, on your own time.

**Additional Bb Experiments**

Data from AGILE R100 showing 4 mL of llama serum target analyte diluted in 1X PBS with 0.1% tween buffer binding to 11 nM Borrelia burgdorferi bacteria.

Data taken with AGILE 96 well prototype platform at NCE2ID using 500 pg/mL of bacterial antigen target analyte binding to immobilized monoclonal antibody.

**AGILE R100 Sample Workflow**

1. Baseline read
2. Attach to field effect biosensor surface
3. Association
4. Dissociation

![Image of AGILE R100 workflow](Image 3)