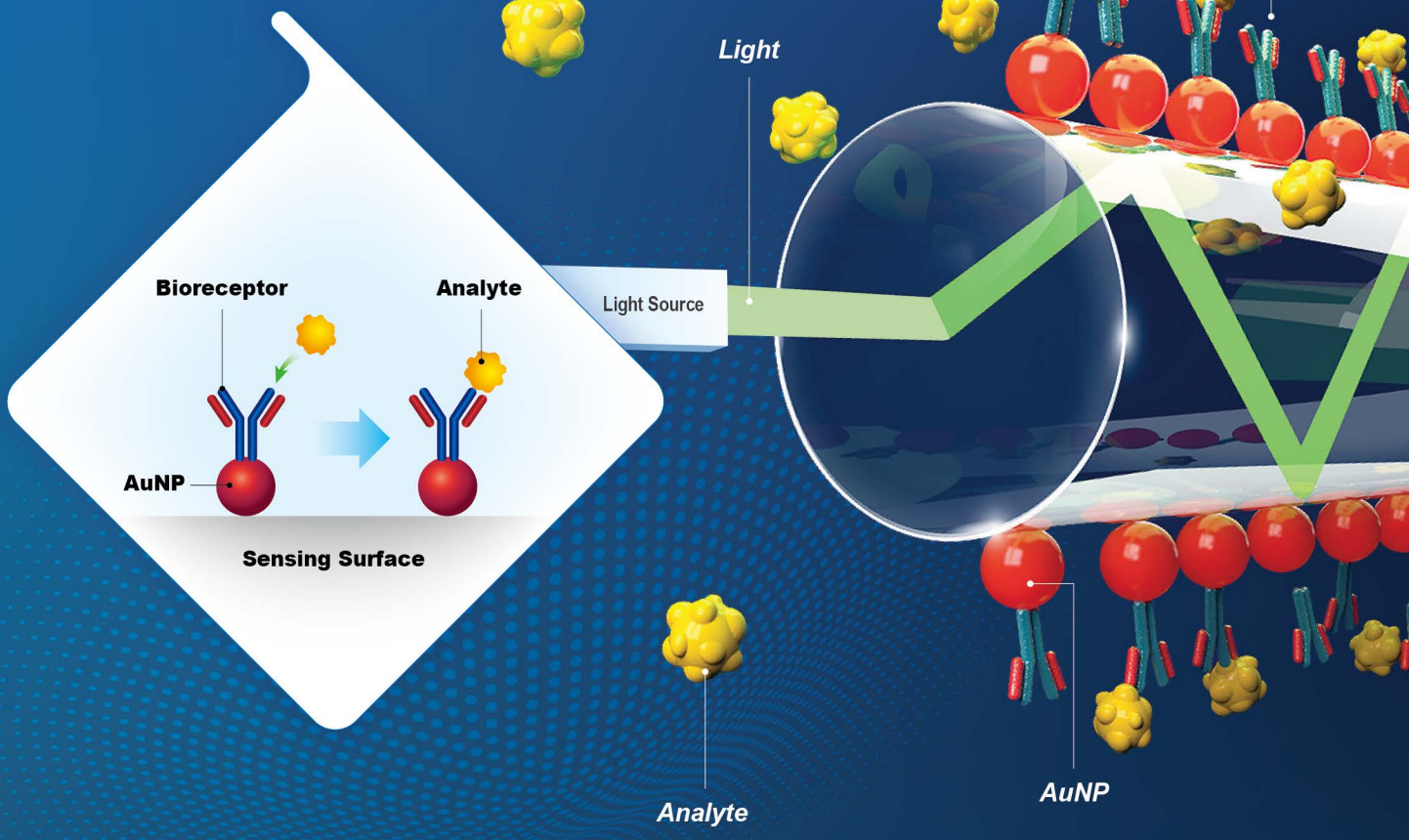
INSTANT NanoBiosensors

Antibody Characterization Services

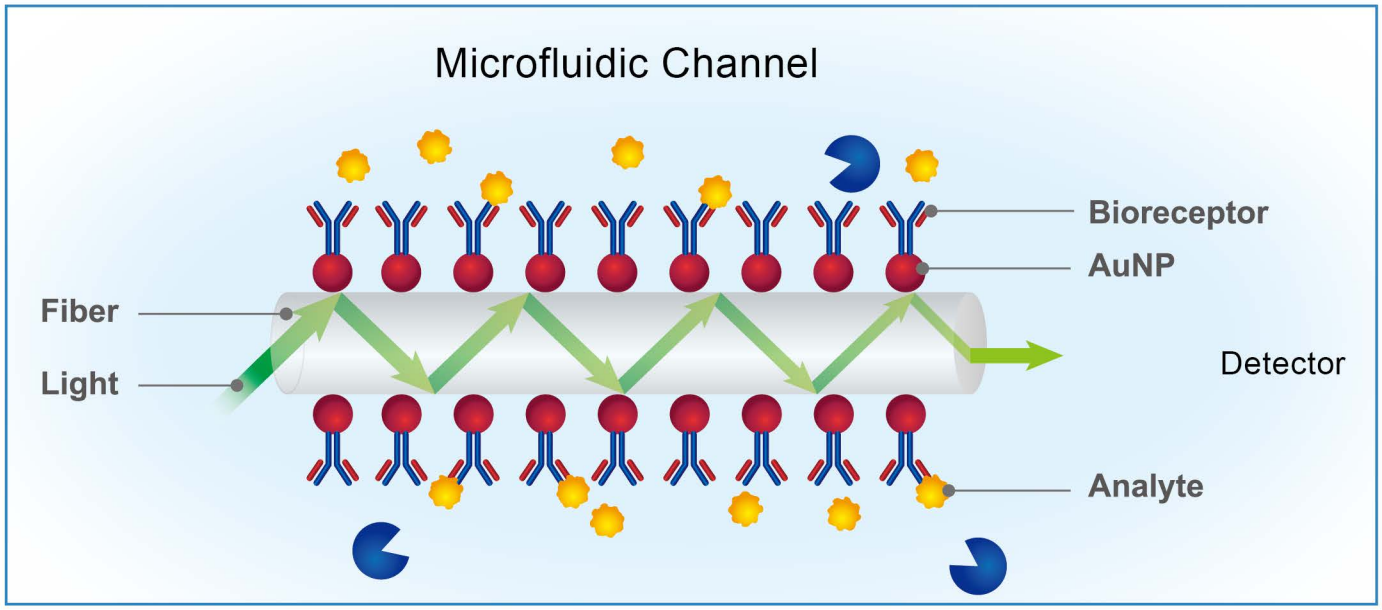
Affinity Analysis Service | Epitope Binning Service



Experience the benefits of FOPPR Fiber Optic Particle Plasmon Resonance

Technology Introduction

Fiber optic particle plasmon resonance (FOPPR™)



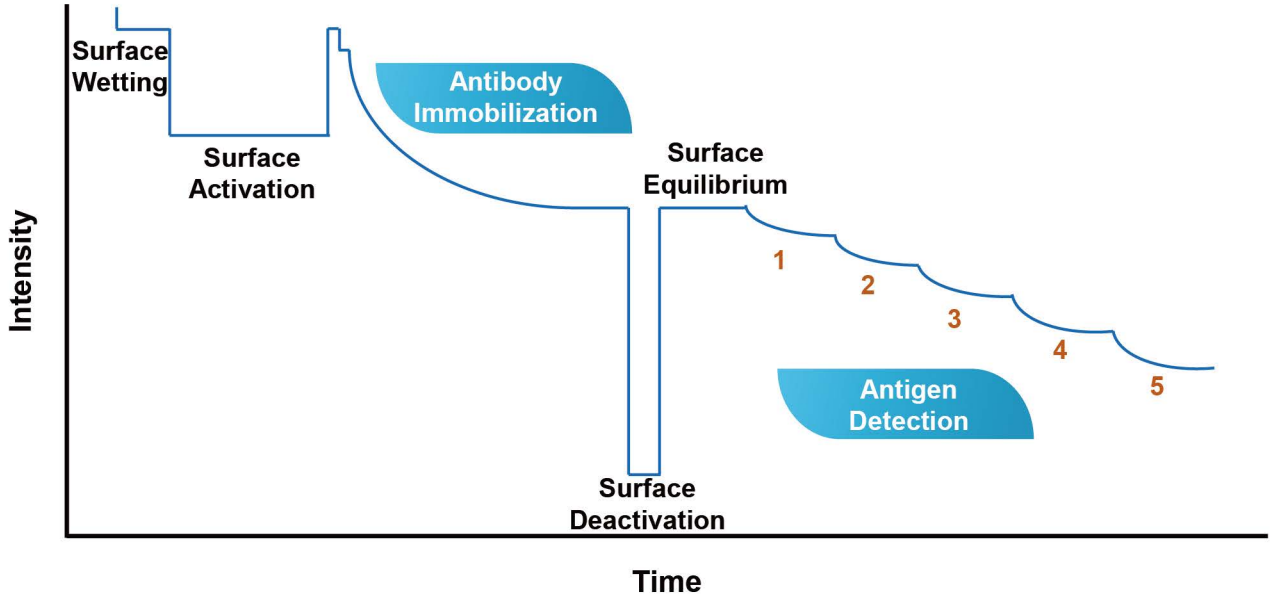
Our biosensing platform takes advantages of the technologies of fiber optic particle plasmon resonance (FOPPR™) and microfluidic chip to achieve a label-free and ultrasensitive detection of analyte up to 5 orders of linear range within a few minutes. After coating gold nanoparticles (AuNPs) onto an unclad segment of an optical fiber, antibodies can then be immobilized onto the surface of AuNPs. Total internal reflection (TIR) occurs as light propagates along the fiber. This creates an evanescent field causing the AuNPs to undergo particle plasmon resonance (PPR), thus attenuating the light transmitted through the fiber. The binding of antigen to antibody on the surface of AuNPs attenuates more light energy thus results in decrease in light intensity. This change of light intensity is recorded in real-time by our state-of-art INB-200 analyzer during each assay. INB-200 analyzer is easy to use and offers a self-referencing option in order to reduce thermal or bulk-composition effects or to further compensate non-specific adsorption of biomolecules in complex samples. Our platform is the best choice for characterizations of antibodies and developments of vaccines and other pharmaceutical products, as well as clinical diagnostics and a variety of other demanding scientific applications. Below are two examples of the custom services that Instant NanoBiosensors currently offers using INB-D200 system.

The rank of scouting antibodies affinity analysis based on K_a/K_d and K_D

Epitope binning-identify up to four different antibodies binding to different epitopes of a certain antigen.

Affinity Analysis Service

Antibody affinity is defined as strength of the binding interaction between antigen and antibody. It depends on the closeness of the stereochemical fit between antibody binding site and antigenic determinant, the size of the area of contact between them, and the distribution of charged and hydrophobic groups. The rate and strength of interactions between molecular species are important in biochemical research. These properties are measured through the kinetic and affinity constants of the analyte of interest.



FOPPR™ technology can perform real-time antibody-antigen interaction analysis and provide information about binding kinetics of antibody-antigen pairs as well as affinity. This method does not require extra dissociation and regeneration steps thus reducing tue complication of experiment process and detection cost.

Epitope Binning Analysis

In the antibody development process, the most suitable monoclonal antibodies (mAbs) are selected based on characterizations of specificity, stability, and overall biophysical properties. Epitope binning is a critical step in which a library of mAbs specific to a given antigen are grouped into "bins" based on the epitopes they bind to. Conventional assays, whether in the sandwich, premix, or tandem format, usually involve pairwise testing of the mAbs to determine whether the same or a closely related epitope (same bin) or occupy different epitopes (different bins). The binning process becomes time- and materials-consuming as the number of mAbs to be characterized increases. To overcome this challenge, epitope binning via the direct assay in the tandem format with FOPPR can accommodate up to four mAbs in one experimental run, enabling this characterization process to be more time- and material efficient for scientists.

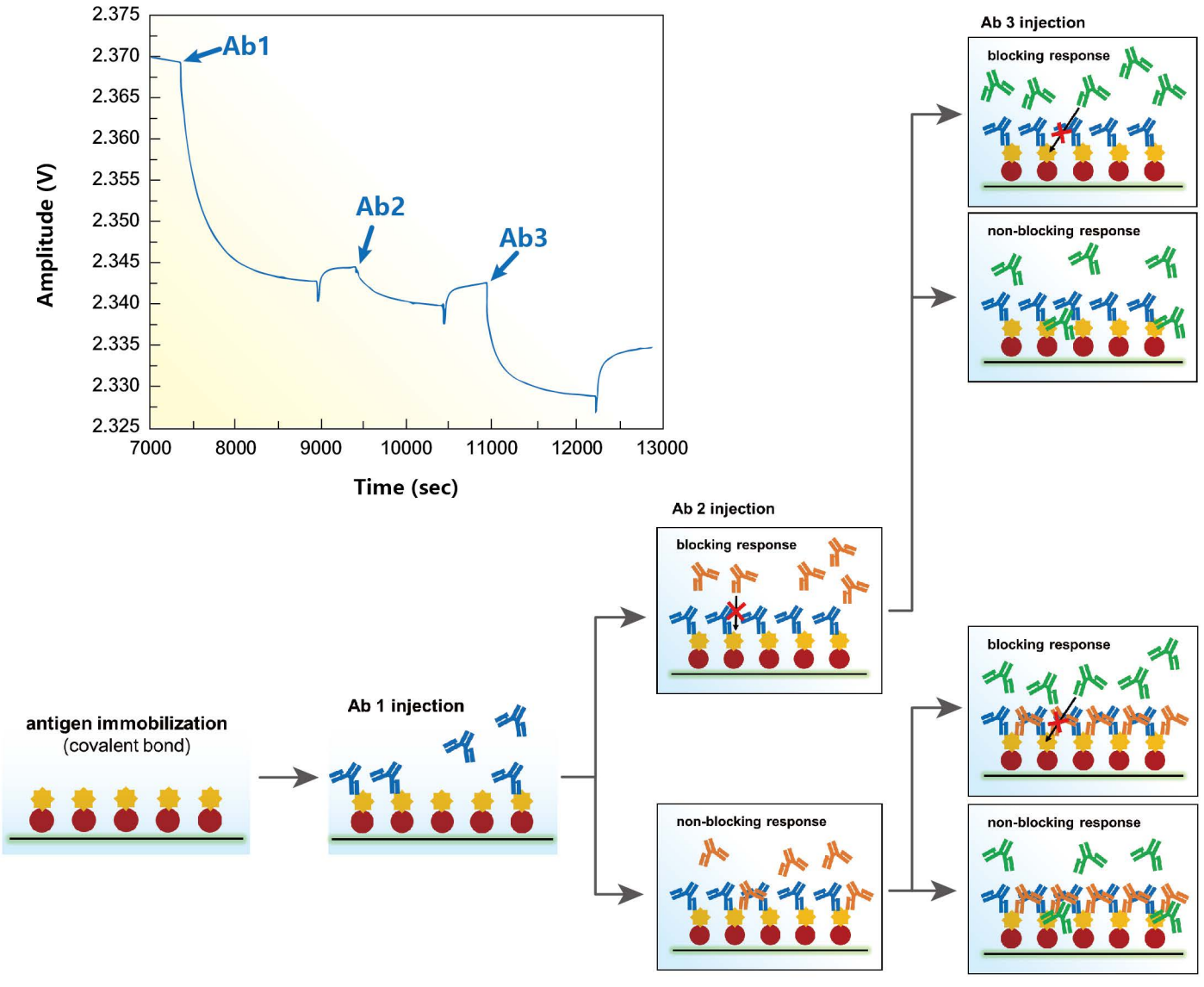


Fig. 1 Experiment scheme with the direct assay in the tandem format with FOPPR.

For brevity, the experimental scheme in Fig. 1 demonstrates only three mAb injections. The antigen is first immobilized onto the sensing surface. The first mAb is then introduced to the sensing surface at a saturating concentration, followed by a second mAb. The second mAb can produce a blocking or a non-blocking response. Following the second mAb, a third mAb is introduced to the sensing surface. This third mAb can similarly produce a blocking or a non-blocking response. Based on the blocking and non-blocking patterns, experiments with different mAb injection orders can be designed and carried out to correctly bin the mAbs.

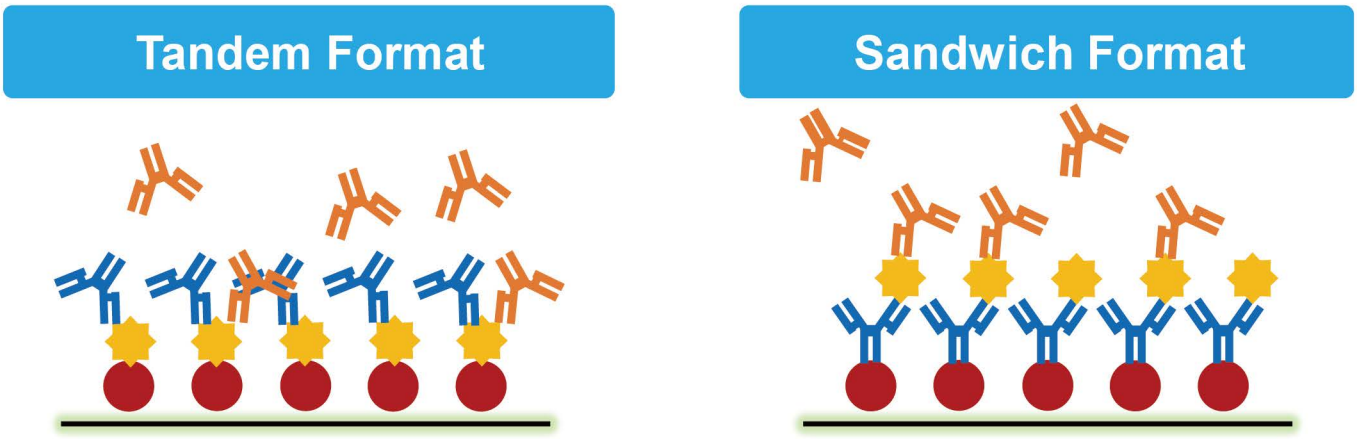


Fig2. Epitope binning-identify

It is worth to mention that, if you need to compare a series of antibodies that target different regions with similar affinity constants, we are capable of performing epitope binning to evaluate each antibody separately (Fig. 2). All of these could have significant effects for candidates' efficiency and pharmacokinetics evaluation.

Service workflow

Pre-discussion and quotation

- The technology is currently being used for research applications in several therapeutic areas, including oncology, neurology, inflammation, and infectious disease.

  To request a quotation and learn more about FOPPR™ services please contact team members via bd@instantnano.com and we will reach out to you shortly.

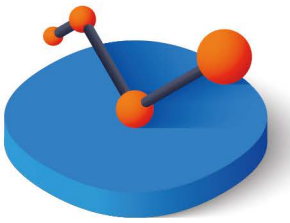
Project confirmation with agreement

- Case confirmation & Sign the agreement
- Case opening

Sample Collection

Sample requirements * Please contact us for further details.

- Purity ≥ 80%
- Concentration ≥ 0.64 mg/mL
- Volume ≥ 100 μL



Antibody Characterization Services

- **Affinity Analysis Service : the range of affinity constants that can be determined covers much of the range found in biomolecular interactions.**
- **Epitope Binning Service: epitope binning-identify up to four different antibodies binding to different epitopes of a certain antigen.**

Final report

- **Affinity Analysis Service : with sample information, affinity results of each pair of samples, including ka, kd and KD.**
- **Epitope Binning Service : with sample information, affinity results of each pair of samples, including ka, kd and KD, epitope binning results of one injection order of antibodies.**

FOPPR®

Fiber Optic Particle Plasmon Resonance

INSTANT NanoBiosensors

Affinity Analysis Service | Epitope Binning Service

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