nicoya
LIFESCIENCES

High Sensitivity Sensor Chips for Enhanced Molecular Detection using OpenSPR™

Summary
• OpenSPR™ High Sensitivity Sensors provide up to 4x higher sensitivity for the most challenging SPR applications. • High Sensitivity Sensors enable easy detection of proteins and small molecules with a small size ratio compared to the ligand.

Overview

OpenSPR™ is a powerful instrument providing in-depth label-free binding kinetics for a variety of molecular interactions. Our line of High Sensitivity Sensors provide an extra boost of sensitivity for the toughest SPR applications. The High Sensitivity Sensors provide up to 4x higher sensitivity localized to the sensor surface, enabling higher detection signals for both ligand immobilization and subsequent analyte detection for kinetic analysis. This is particularly advantageous for small molecule analysis, and can also be used to enhance the signals of other larger biomolecules.

Table 1. High Sensitivity Sensor Chemistries for OpenSPR™

High Sensitivity Sensors	For Immobilization of
Carboxyl	Any amine group via EDC/NHS
NTA	His-tagged targets
Streptavidin	Biotin-tagged targets

Example 1:
Protein – Protein Interaction Analysis

Ligand: Protein A
Analyte: Human IgG
Sensor: High Sensitivity Carboxyl Sensor

High Sensitivity Sensors can be used to enhance the signal of larger biomolecules for a variety of different applications. In this example, a 4x increase in the immobilization level of Protein A onto the High Sensitivity Carboxyl Sensor is observed compared to that of a Standard Carboxyl Sensor (Figure 1). The increase in the immobilization level is obtained without altering the immobilization conditions or increasing the density of the immobilized ligand. Using the same concentrations of Human IgG as the analyte, increased binding signals are obtained while maintaining the same curve shape and kinetic integrity (Figure 2). Increasing the detection sensitivity for larger biomolecules allows for the ability to use lower concentrations, providing increased flexibility for kinetic analysis.
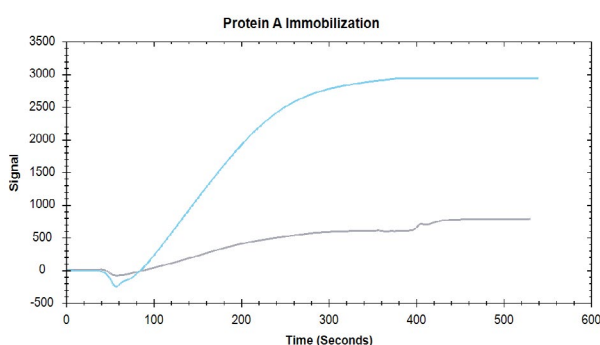

Figure 1. Immobilization of Protein A onto a High Sensitivity Carboxyl Sensor (blue) and Standard Carboxyl Sensor (grey).

Speak with an application scientist today:

info@nicoyalife.com
1-877-673-6777
www.nicoyalife.com

Connect with us on social media:
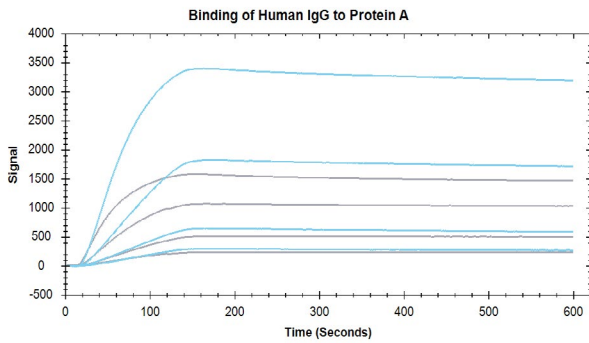
Binding of Human IgG to Protein A

Figure 2. Binding of Human IgG at concentrations of 4.1 nM, 12.3 nM, 37 nM and 111nM. Blue lines are measured on a High Sensitivity Sensor and grey lines are measured on a Standard Sensor.

As these results show, High Sensitivity Sensors provide users with more flexibility for kinetic analysis of larger biomolecules by increasing both the ligand immobilization and analyte detection signal.

Example 2:
Protein–Small Molecule Interaction Analysis

Ligand: Carbonic Anhydrase II (CAII)
Analyte: Furosemide
Sensor: High Sensitivity Carboxyl Sensor

Protein–small molecule applications can be challenging due to the large size ratio between the protein (commonly used as the ligand) and small molecule (commonly used as the analyte). In this example, the size ratio between CAII (30 kDa) and Furosemide (330 Da) is approximately 100:1, which means it is important to obtain a large ligand binding signal in order to detect the subsequent analyte binding.

Using a High Sensitivity Carboxyl Sensor, an immobilization level of 5000 pm of the CAII was obtained to be able to easily measure the binding of Furosemide (Figures 3 and 4).
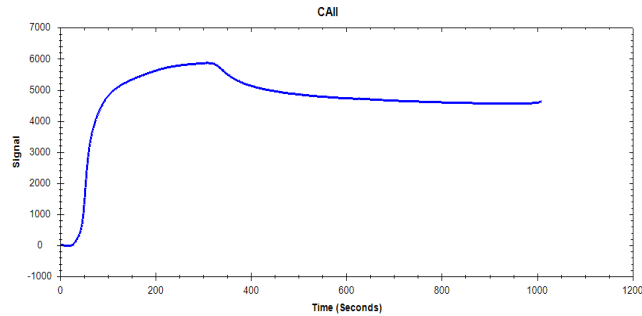
CAII

Figure 3. Ligand Immobilization of CAII onto a High Sensitivity Sensor.

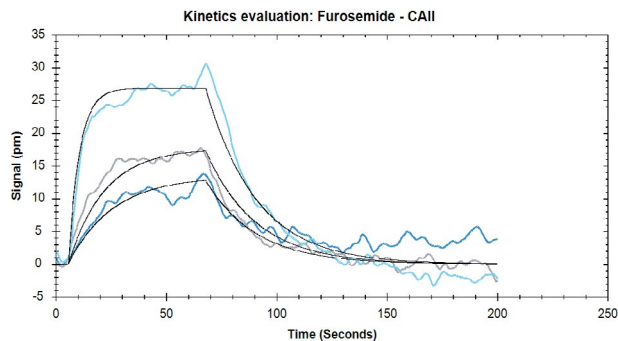**Kinetics evaluation: Furosemide - CAII**

Figure 4. Binding of Furosemide at concentrations of 333nM, 1µM, and 9µM. Solid black lines are the one to one binding model fits.

As these results show, High Sensitivity Sensors allow users to measure small molecule binding interactions by increasing ligand immobilization and enhancing analyte signal detection levels.

Speak with an application scientist today:

info@nicoyalife.com
1-877-673-6777
www.nicoyalife.com

Connect with us on social media:

[Instagram] [in] [Twitter] [f]