iMSPR

miniL & miniX Special Version

The Most Sustainable Molecular Interaction Analysis system

iCLUEBIO

"Just as every life process begins with molecular binding,

SPR is the essential key

that illuminates these interactions in real time, label-free."

iMSPR series

The **iMSPR Series** is a sophisticated, label-free analysis system designed for real-time monitoring of intermolecular binding, powered by Surface Plasmon Resonance (SPR) technology. This versatile platform serves as a cornerstone for developing innovative biosensors, identifying novel biomarkers, and accelerating the discovery of new drug candidates. Its precision extends beyond basic research, supporting pharmaceutical quality evaluation and advanced medical diagnostics.

The core of the iMSPR experience lies in the seamless integration of high-performance hardware and specialized consumables. Our dedicated Sensor Chips and Capture Kits are engineered to maximize data sensitivity and ensure consistent reproducibility across diverse applications. From fundamental affinity studies to high-density multi-array screening, the iMSPR family provides diverse configurations tailored to every stage of research.

In this brochure, we specially highlight our essential desktop configurations:

- ✓ **iMSPR-miniL:** A **Compact SPR System** optimized for essential kinetics and affinity evaluations with maximum space efficiency.
- ✓ **iMSPR-miniX:** A **Fully Automated Desktop SPR System** equipped with a smart, maintenance-free autosampler for seamless, walk-away operation.

Experience a new standard of efficiency and scalability with the **iMSPR-miniL** and **iMSPR-miniX**, where advanced hardware and intuitive software converge to transform complex molecular interactions into strategic biological insights.



iMSPR-miniL,
Essential SPR system for Kinetics Analysis

iMSPR-miniL is a **compact, semi-automated system** that precisely integrates only the essential modules required for evaluating intermolecular kinetics and affinity, such as protein-protein interactions. By stripping away unnecessary features and focusing on core elements directly relevant to research, it is designed to enable life science researchers to initiate molecular interaction analysis with confidence and ease.



One by One Semi-Auto Injection

Precise one-by-one sample injection via **6-port / two position automated injection valve**

Built-in Degasser

Removes micro-bubbles to suppress refractive index fluctuations for stable data

2 channels U-type Fluidics

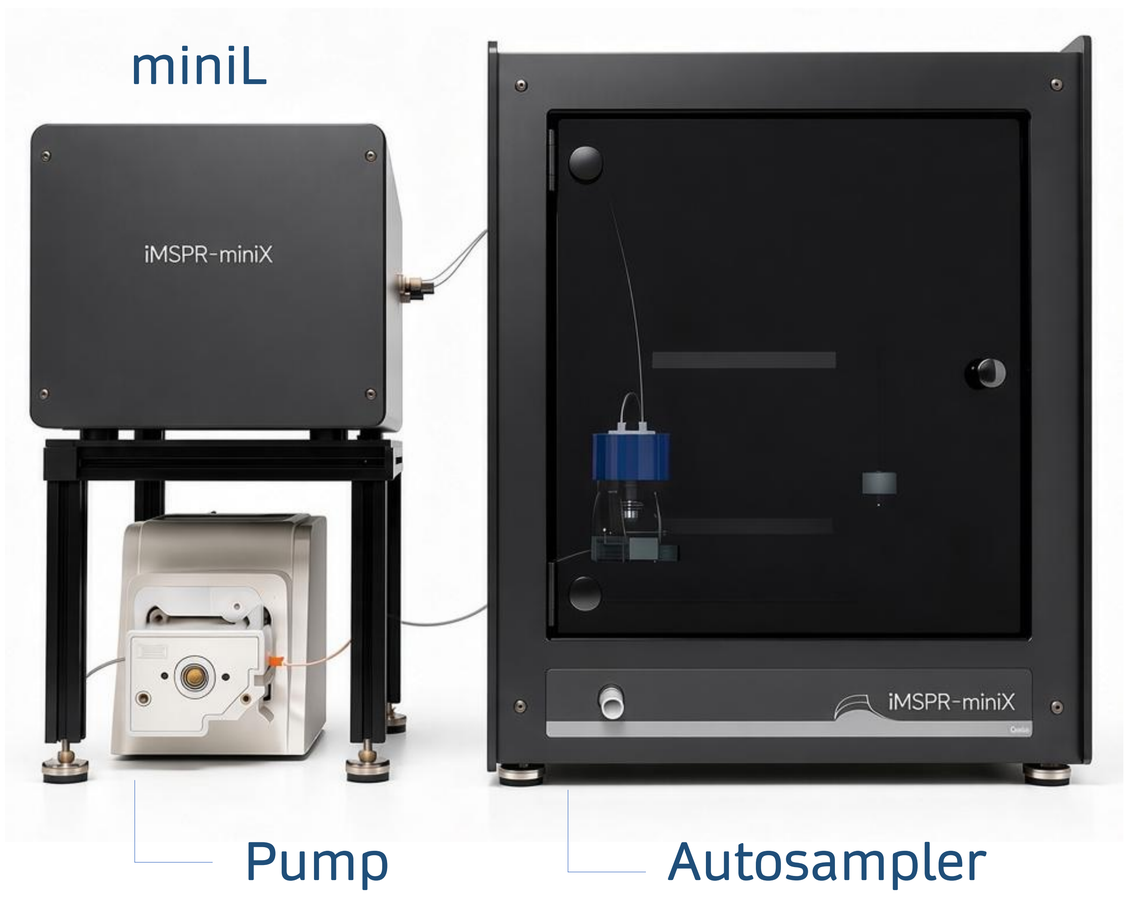
Minimized inter-channel interval between Reference and Ligand channels for accurate evaluation

Easy-to-Use App-based mini OS

Use-friendly app-based mini OS for fast setup and smooth operation

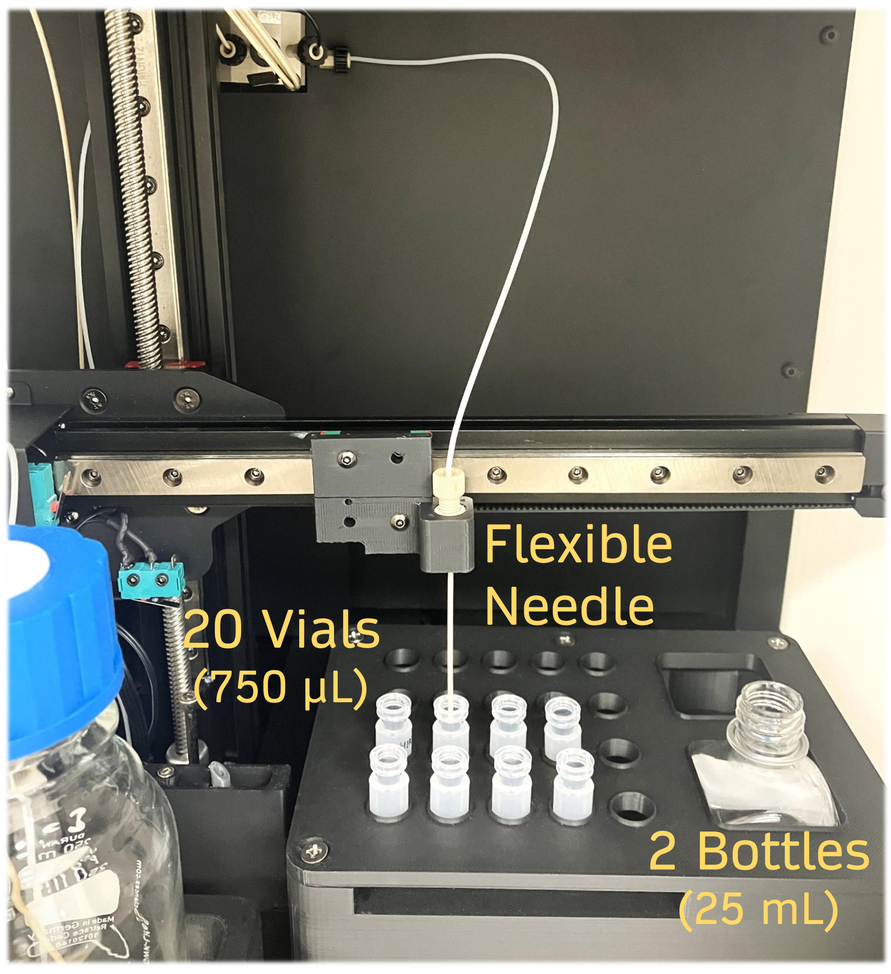
iMSPR-miniX,
Automated Desktop SPR System

iMSPR-miniX is a highly practical, **fully automated system** that combines the essential modules for evaluating intermolecular kinetics and affinity—such as protein-protein interactions—with an autosampler for complete automation. By eliminating superfluous components and incorporating only the core elements vital to research, it is designed to allow life science researchers to conduct automated molecular interaction analysis reliably and without unnecessary complexity.



Automation for a Streamlined Workflow

Upgrade your iMSPR-miniL to miniX by simply adding an Autosampler. The miniX delivers molecular kinetics data for up to 4 samples in a single run, with the entire workflow fully automated according to your custom setup wizard.

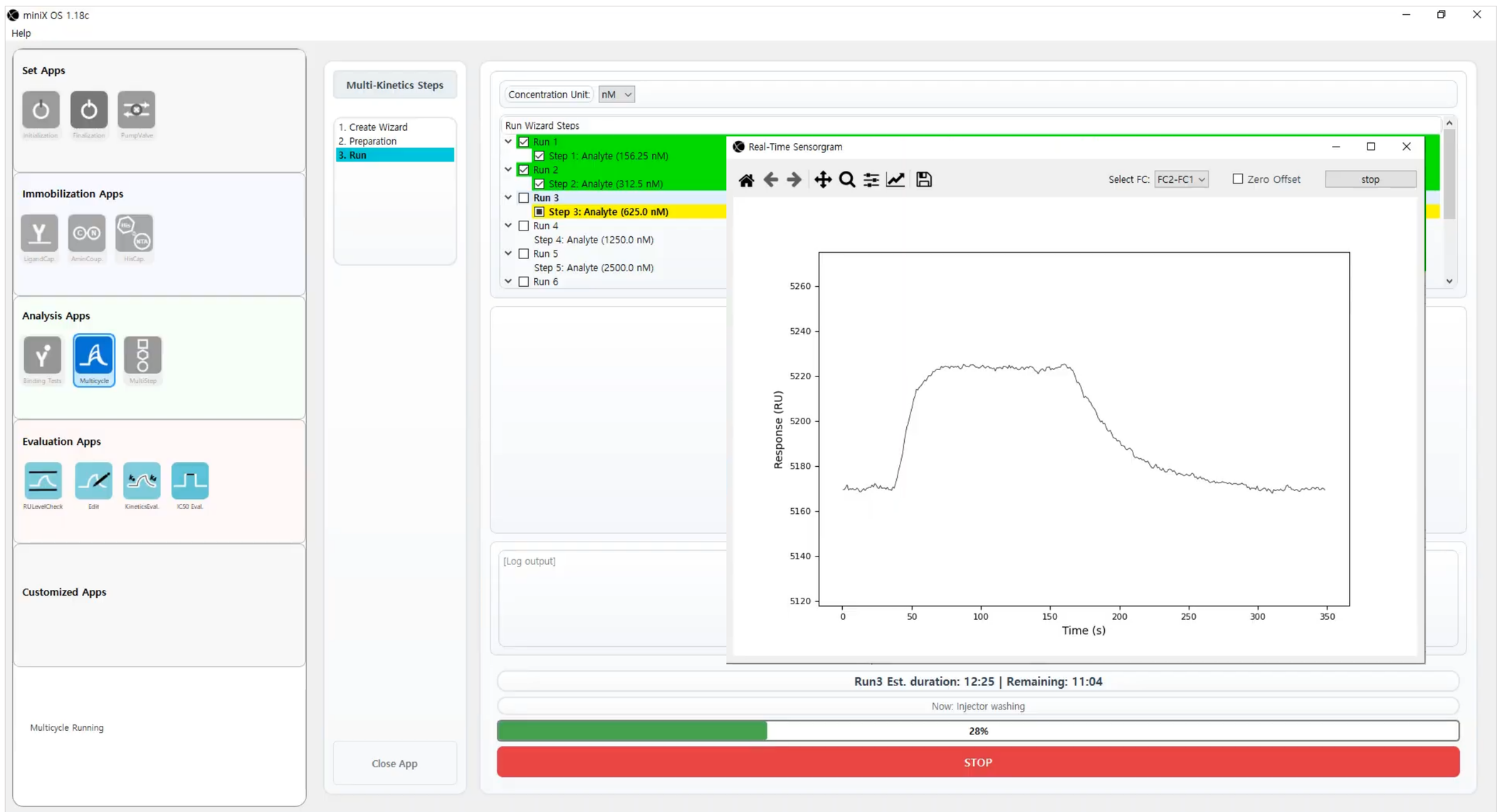


Autosampler Inside

Smart & Maintenance-Free Autosampler

Engineered for practical automation, our smart autosampler handles up to 20 vials without septa piercing, avoiding rubber contamination. Its semi-permanent, **flexible PEEK needle** eliminates frequent needle replacement and damage. It supports up to **20 binding screening tests** or full kinetics/affinity analysis for **up to 4 targets per run**, with **dual 25 mL bottle positions** for shared solutions like regeneration buffers.

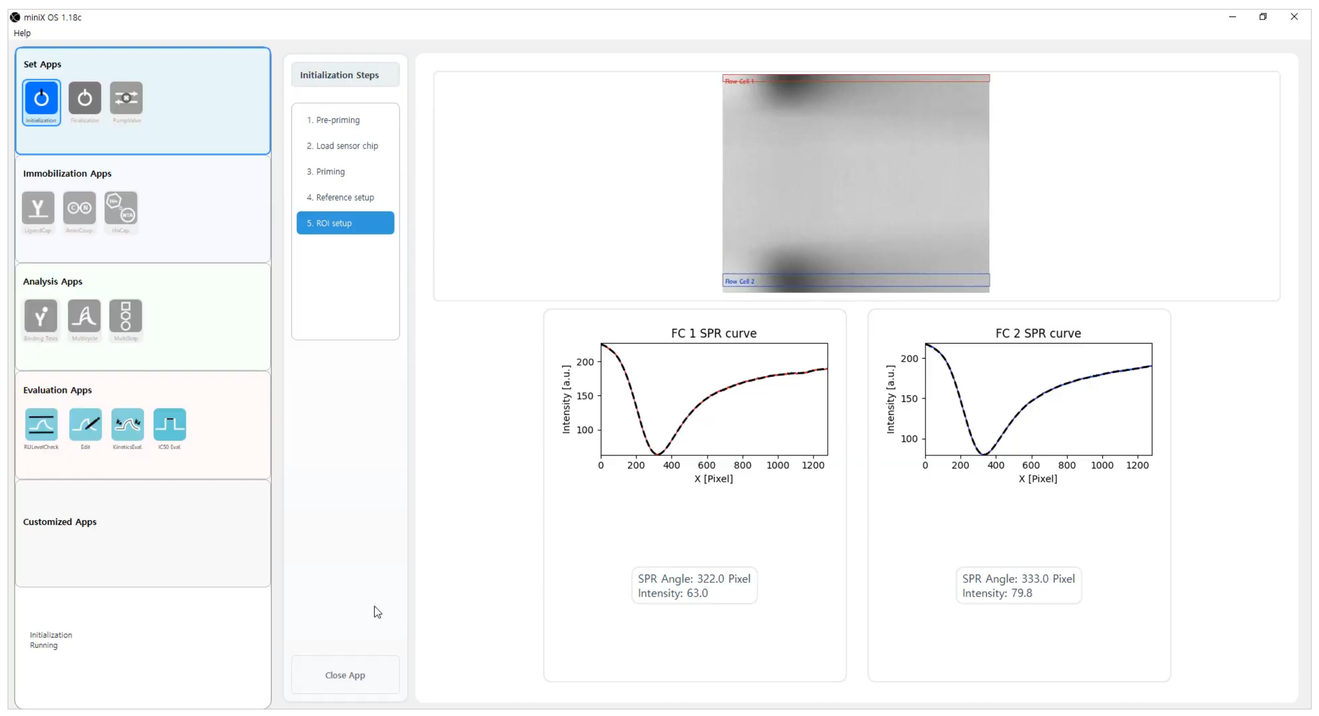
mini OS,
App-Driven Simplicity



Just like using apps on your smartphone, all individual functions can be accessed through intuitive applications. Each app is seamlessly connected—allowing you to proceed smoothly from Set Apps to Immobilization Apps, analyze sensorgrams via Analysis Apps, and edit data or derive rate constants and affinity (K_D) using Evaluation Apps. Experience the easiest way to acquire SPR and kinetics data with the all-new, in-house developed mini OS by icluebio.

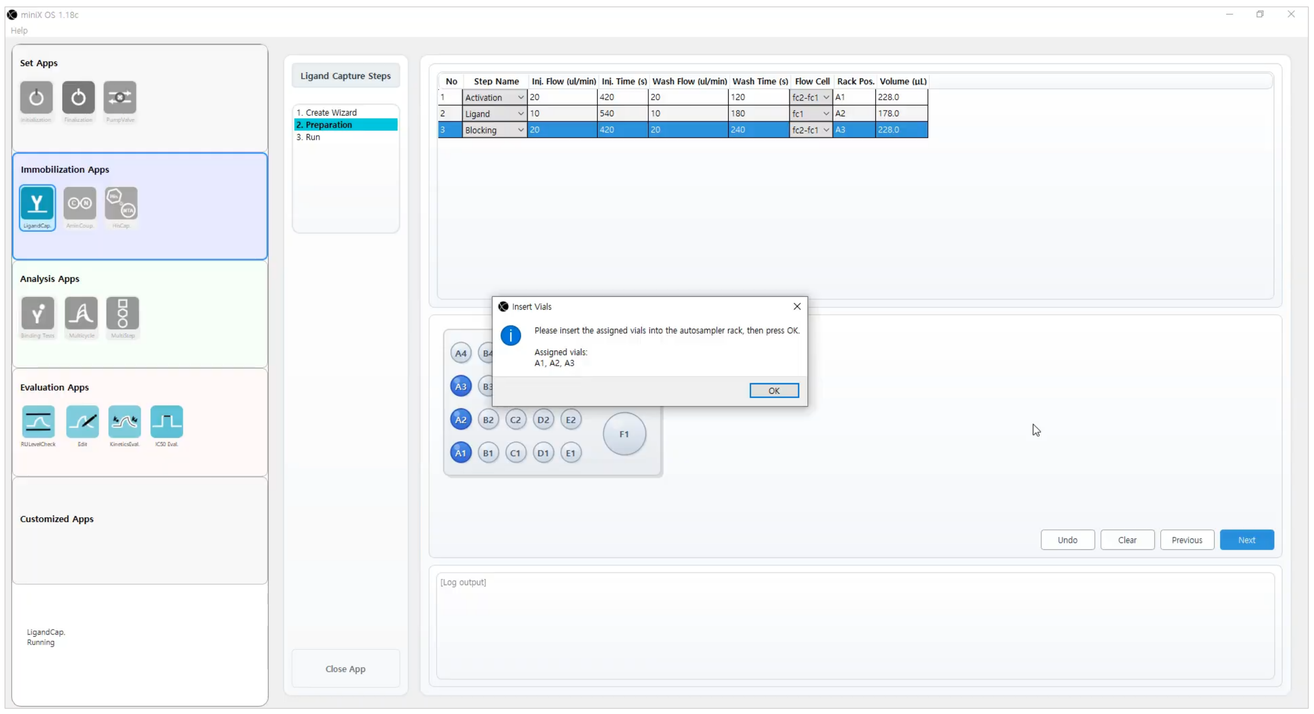
Automatic ROI Setting

SPR data originates from the SPR dip patterns captured by the image sensor. Setting precise Regions of Interest (ROIs) is a critical step for acquiring highly accurate data. Instead of requiring manual configuration, our software automatically sets the optimal ROIs. Furthermore, it intelligently evaluates whether the sensor chip needs to be remounted or if it is safe to proceed to the next step.



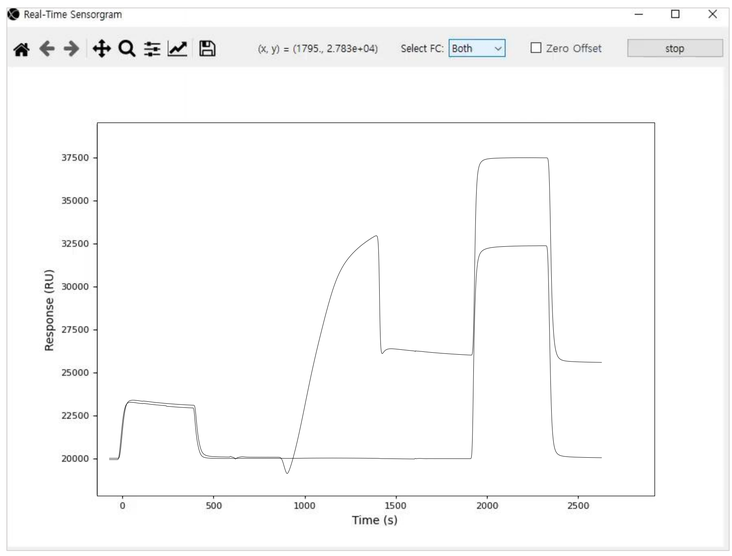
Easy-to-Use Wizard

In the Immobilization and Analysis Apps, simply select the app that matches your specific capture method and experimental protocol. Standard wizards are pre-configured, requiring only minor adjustments to fit your assay needs. Then, easily select sample vials with a simple click-and-drag—that is all you need to do.

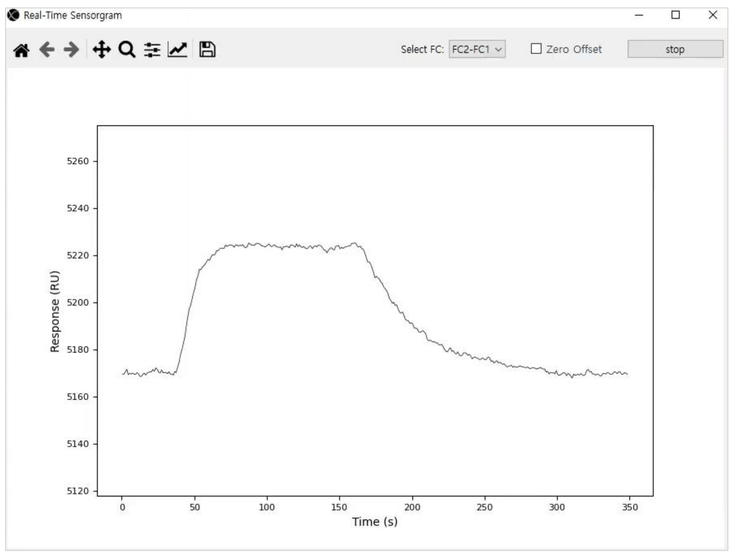


Precise Sensorgram Acquisition

Sensorgrams are displayed in dedicated, real-time windows across all apps. Depending on the application, you can view continuous baseline and injection profiles or individual concentration-specific sensorgrams. Additionally, data from previous injection steps can be reviewed simultaneously in the Evaluation App while the current experiment is running.

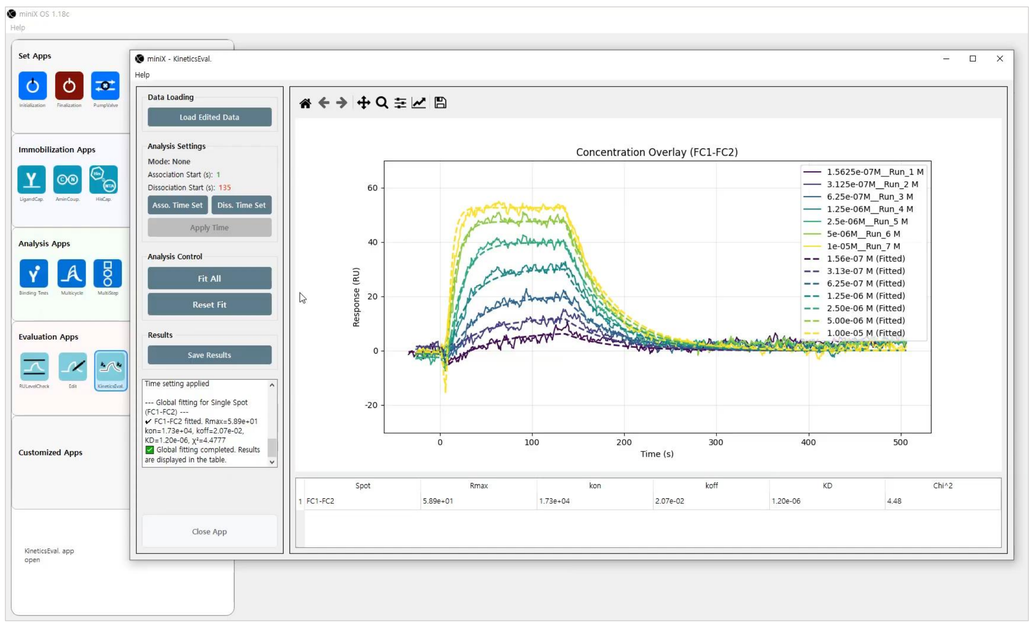


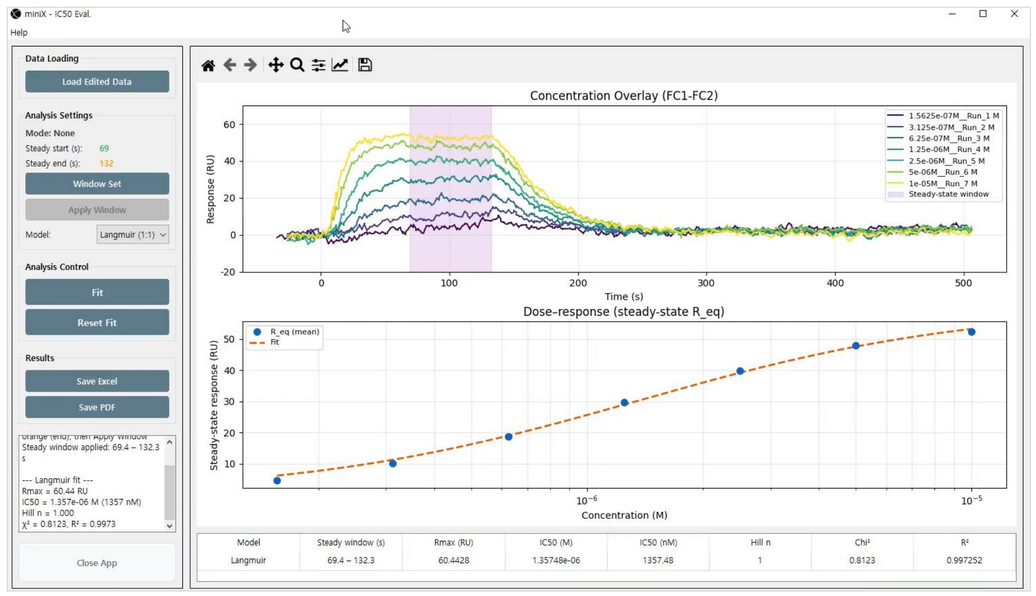
In the Immobilization App, continuous sensorgram profiles for all injection steps are displayed in real time.



In the Analysis App, individual sensorgrams are displayed for each concentration step.

Simple & Powerful Evaluation





Finally, perform comprehensive data analysis in the Evaluation section. Use the Edit App to load and optimize concentration-series sensorgrams. By simply following the sequential UI buttons to import data, set time windows, and click 'Fit', you can effortlessly execute kinetic fitting or steady-state affinity analysis. Experience fast, intuitive data evaluation with mini OS on the iMSPR-miniL and miniX.

Specifications
miniL & miniX



Including (Common)	iMSPR-miniL main system (1 set), Peristaltic pump with single channel (1 set), Degasser with single channel (1 set), U-type Fluidic module (1 ea), Prism holder (1 ea), Detach tool (1 ea), PC (1 pkg), Flat tweezer (1 ea), Matching oil (2 ml), USB cable (1 ea)
Warranty	1 year

Main system (Common)	
SPR type	Angular interrogation
Channels	U-type channel (individual and merged)
Light source	770 nm LED
Detector	2D CMOS image sensor, 1/1.8”, 1.3 MP
Polarizer control	Manual
Incident light range	6˚
RIU range	1.32 ~ 1.38
Association (k_a)/Dissociation (k_d)/Affinity range(K_D)	10^3 ~ 10^7 $M^{-1}s^{-1}$ / 10^{-5} ~ 0.5 s^{-1} / 10^{-3} ~ 10^{-12} M
Noise level (single channel RMSE)	< 0.5 RU
General analysis time/sample	2~15 min
Injection valve, loop volume	6 ports - 2 ways, 200 µl (option 100, 500, 1000 µl)
Injection volume	50 to 200 µl (maximum volume depend on loop volume)
Required sample volume	Injection volume +80 µL
Degasser	Built-in, 1 channel, 100 µL
Device size	400 x 170 x 300 (mm), 8 kg
Power (Power consumption)	AC100 ~ 240V
Materials	100% recyclable Aluminum (more 90%), PEEK

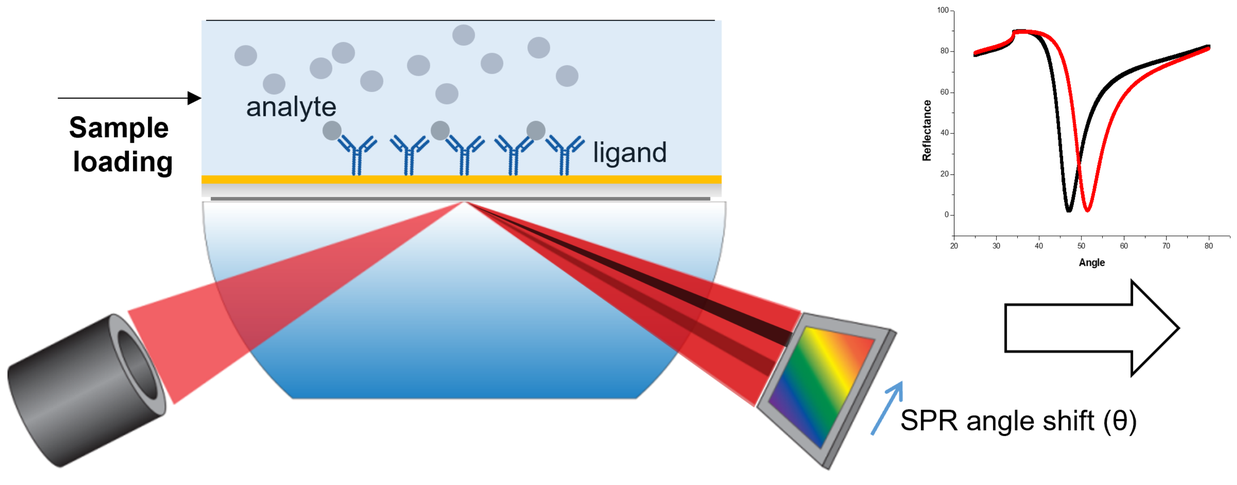
Autosampler (Only miniX)	
Capacity	20 Vials (750 µL), 2 Bottles (25 mL)
Pump type, volume	Syringe, 500 µL
Needle	PEEK tubing
Power	AC100 ~ 240V
Communication	USB
Device size Pack size	390 x 430 x 420 (mm), 20 kg 670 x 580 x 600 (mm), 33 kg

Pump (Common)	
Channel No.	1
Operation tubing	3-stop tubing, ID: 0.25 mm
Flow rate range	10~200 µL/min
Size	232 x 142 x 149 mm, 2.5 kg
Power	AC100 ~ 240V

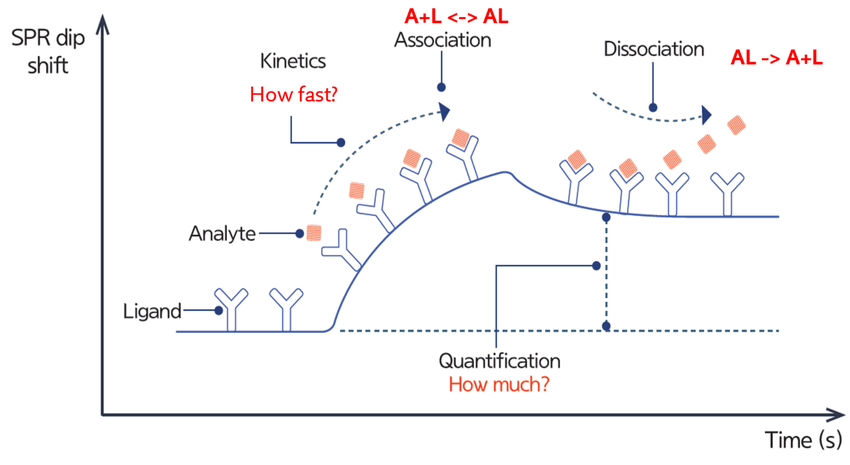
PC (Common)	
CPU	I5 or Ryzen5
RAM	8G
Operation	Window, mini OS
Power	AC100 ~ 240V

What is SPR?

Surface Plasmon Resonance (SPR) is a phenomenon in which the reflected light disappears at a specific angle of incidence when light is incident on the side of the prism on which the gold thin film is placed. SPR biosensor is a powerful technique to measure biomolecular interactions in real-time without labeling materials. When biomolecules bind on the sensor chip, the surface refractive index changes and the angle of the reflected light shifts. Molecular interaction is monitored by acquiring sensorgrams that record this angle change in real time.



Sample loading & SPR angle shift



Sensorgram by SPR angle shift in real-time

How to Monitor Interaction

1. The phenomenon that the reflected light disappears at a specific angle of incidence: **SPR angle**
2. The **SPR angle shifts** when the surface refractive index changes due to biomolecular binding on the sensor chip.
3. The **sensorgram is acquired** by recording SPR angles in real-time
4. **Monitoring of intermolecular binding** through sensorgram

Key Applications of iMSPR

Biomolecular interaction analysis is not limited to proteins. The interactions between hybrid systems of DNA-DNA, DNA-protein, lipid-protein, small compound-protein and biomolecules and non-biological surfaces can be investigated.

iMSPR is widely used to:

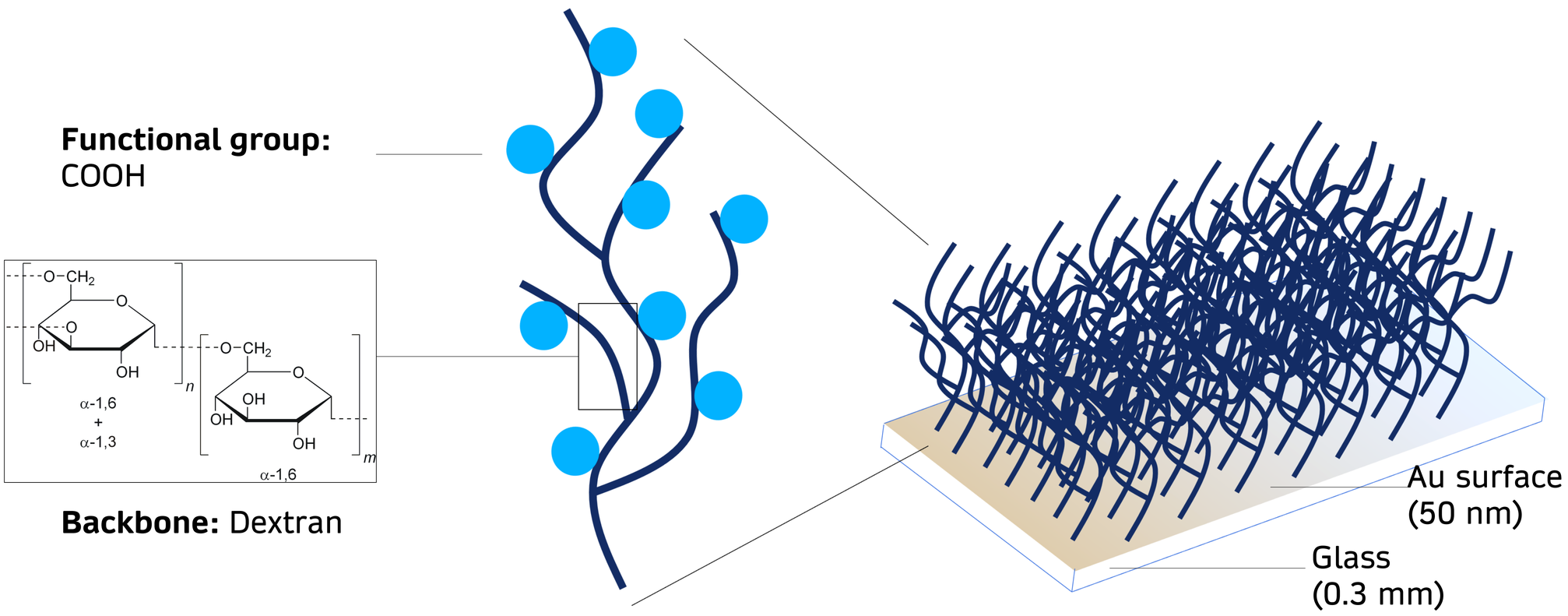
- **Identify the binding** between two or more interactants molecules
- **Screen target candidates** from lots of molecules
- **Determine binding affinity (K_D)** of the interactions
- **Evaluate association (k_a) and dissociation rates (k_d) constants**
- **Quantify analyte concentration** in sample solution

C-Dex105

iMSPR standard sensor chip

Built on carboxymethyl dextran chemistry—the most widely referenced SPR surface matrix since the 1990s—**C-Dex105** offers a proven foundation with extensive literature support. Featuring a high-density, flexible dextran layer engineered by icluebio, it delivers high binding capacity, low non-specific adsorption, and reliable lot-to-lot consistency. It is the ultimate universal chip for analyzing interactions ranging from low-molecular-weight compounds to large proteins.

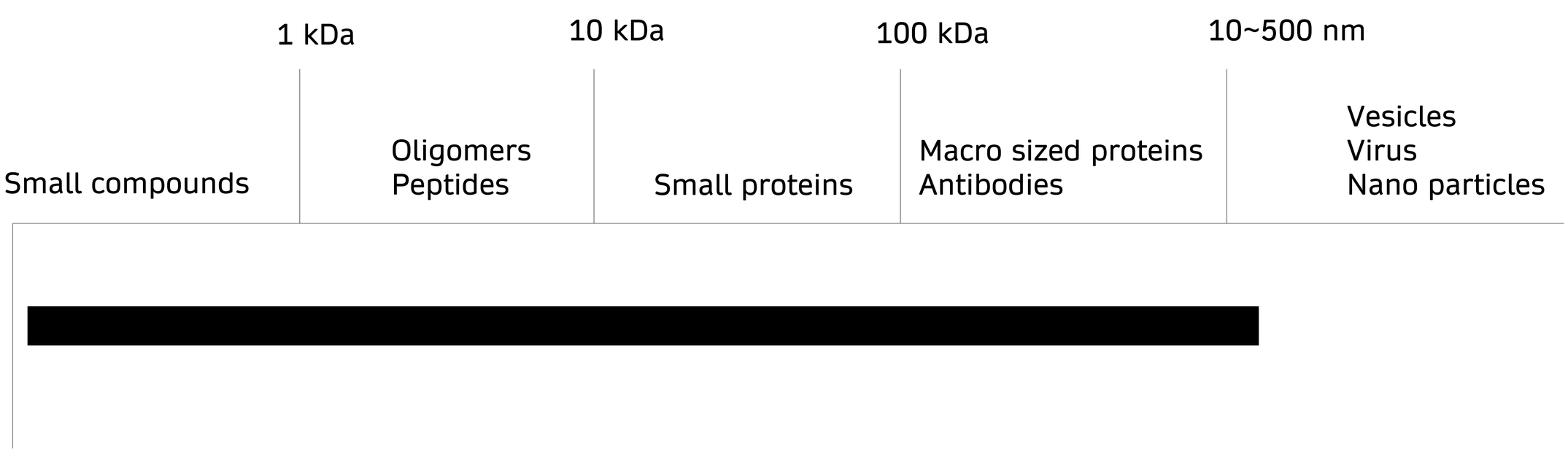
Structure



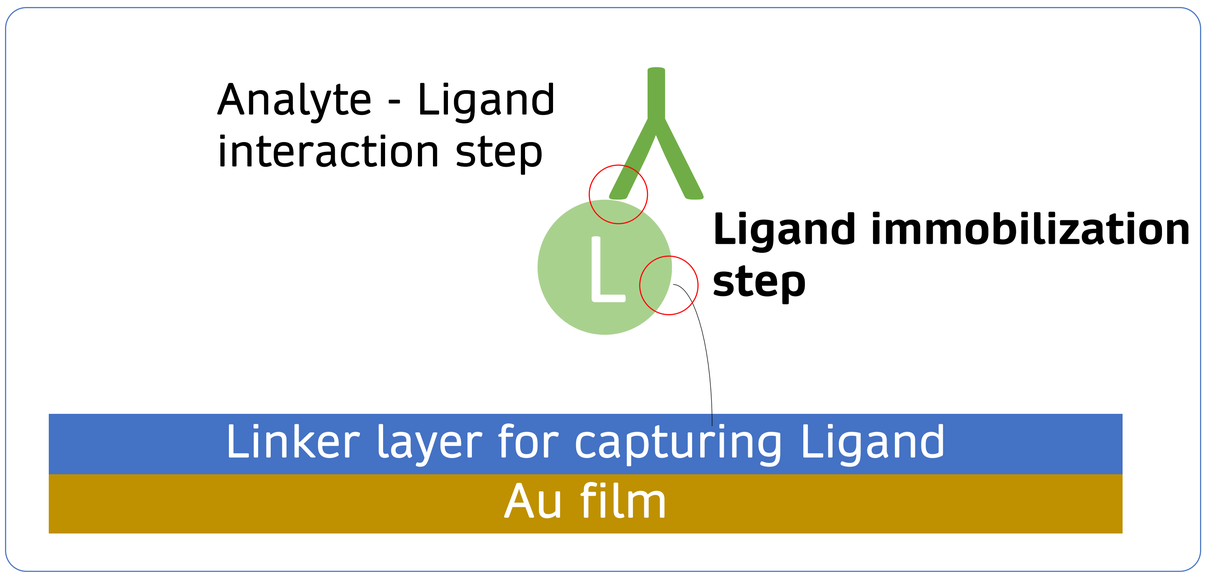
Immobilization level (Max.)

100 ~ 20000 RU (molecule type and MW dependent)

Recommend analytes

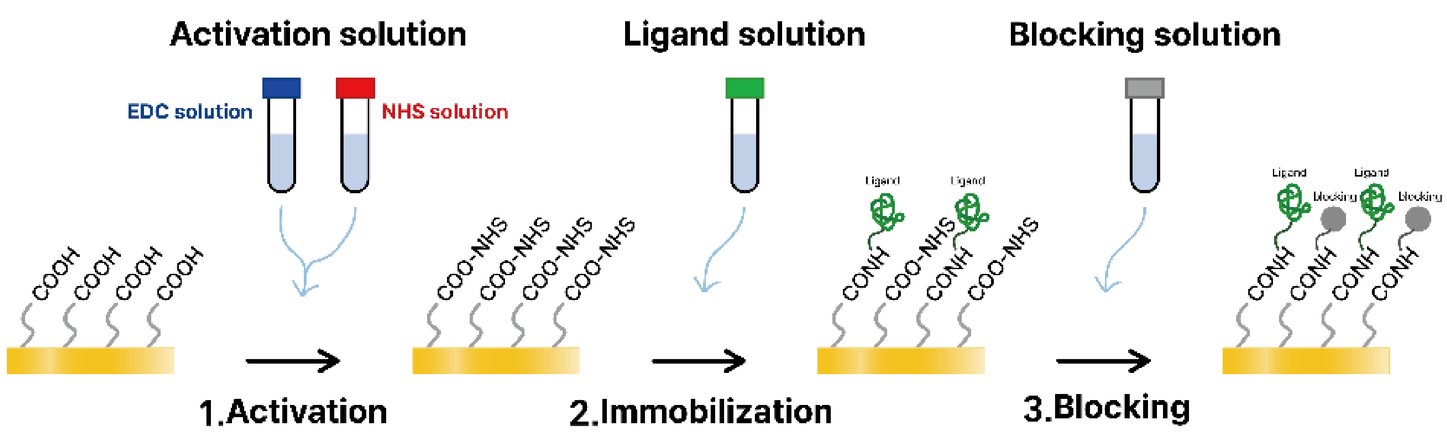


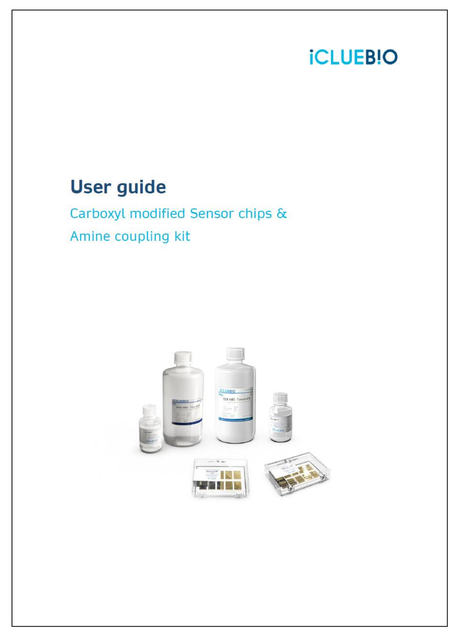
Reagents for immobilization



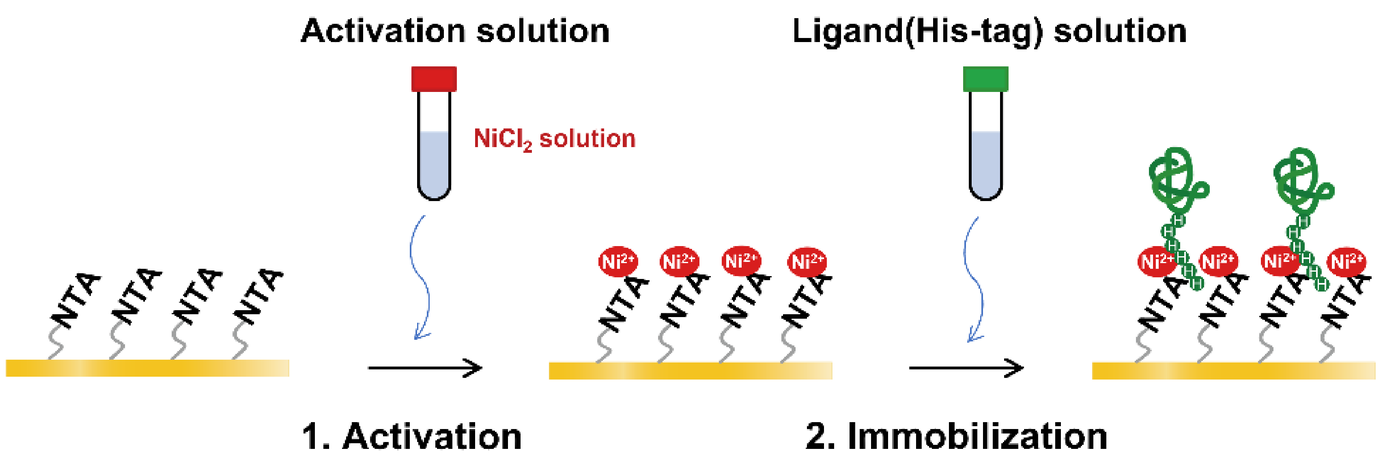
To analyze the binding between analyte and ligand, a ligand immobilization step must be performed on the sensor chip. Try immobilizing the ligand in various ways using the reagent kits provided by icluebio.

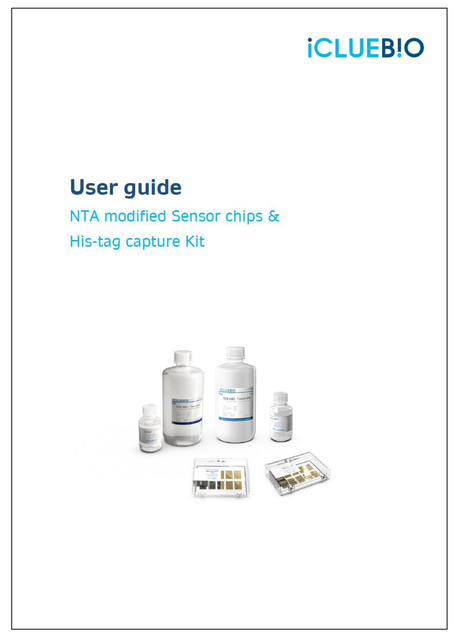
Amine coupling kit



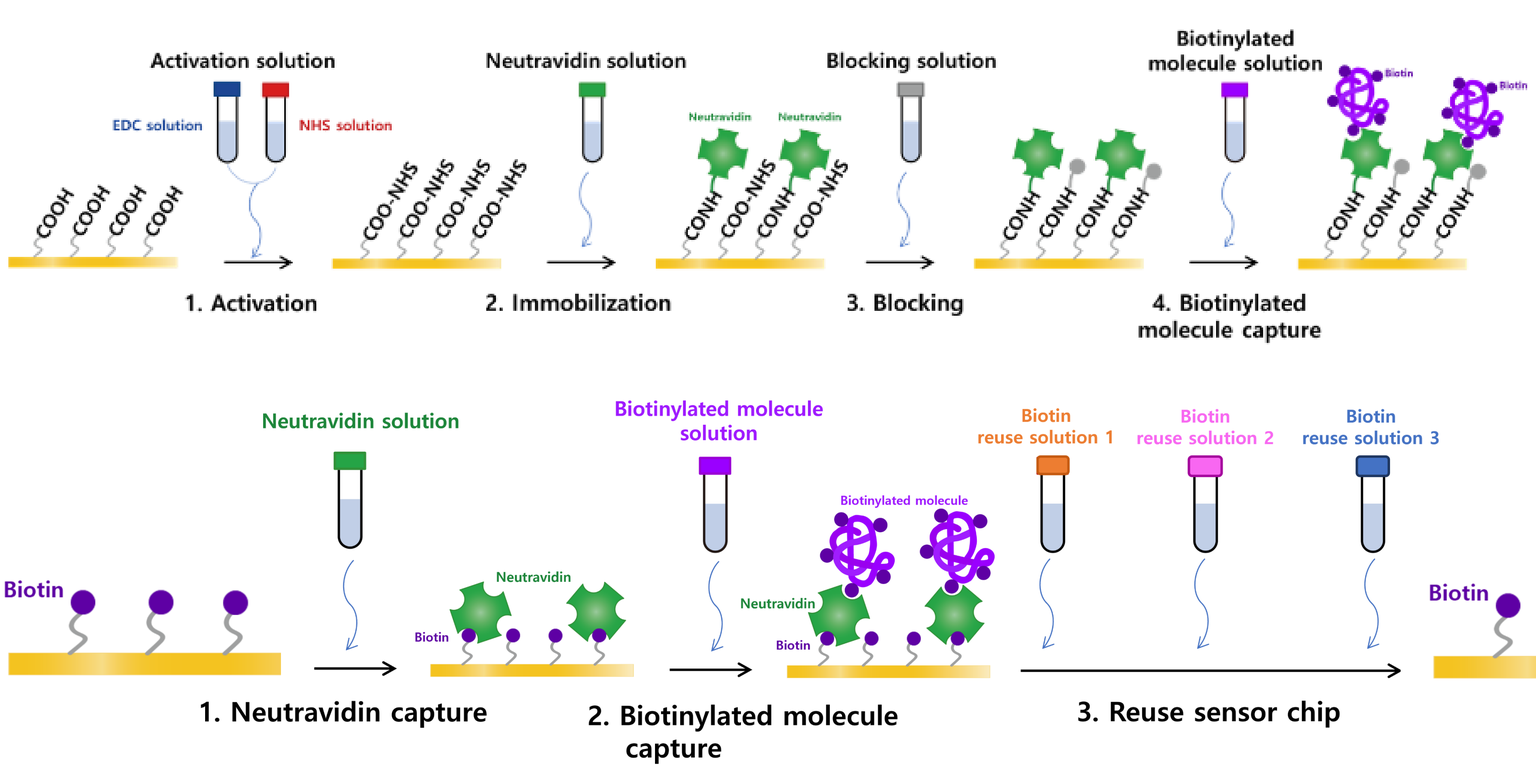


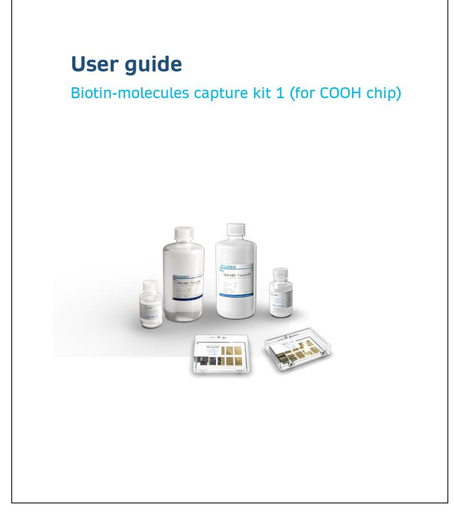
Histag capture kit





Biotin-molecule capture kit 1 & 2







www.icluebio.com

icluebio's iMSPR series is manufactured in Korea and is finally delivered to the customer through precise quality inspection by a specialist. The device experts directly deliver, install free of charge, and perform IQ/OQ right on the spot. After all on-site tests are completed, you will receive training in operation from the education experts in the contents of the handbook.

Phone: +82-31-406-6180

E-mail: sales@icluebio.co.kr

Youtube: https://www.youtube.com/@icluebio

Blog: https://blog.naver.com/hipoo99