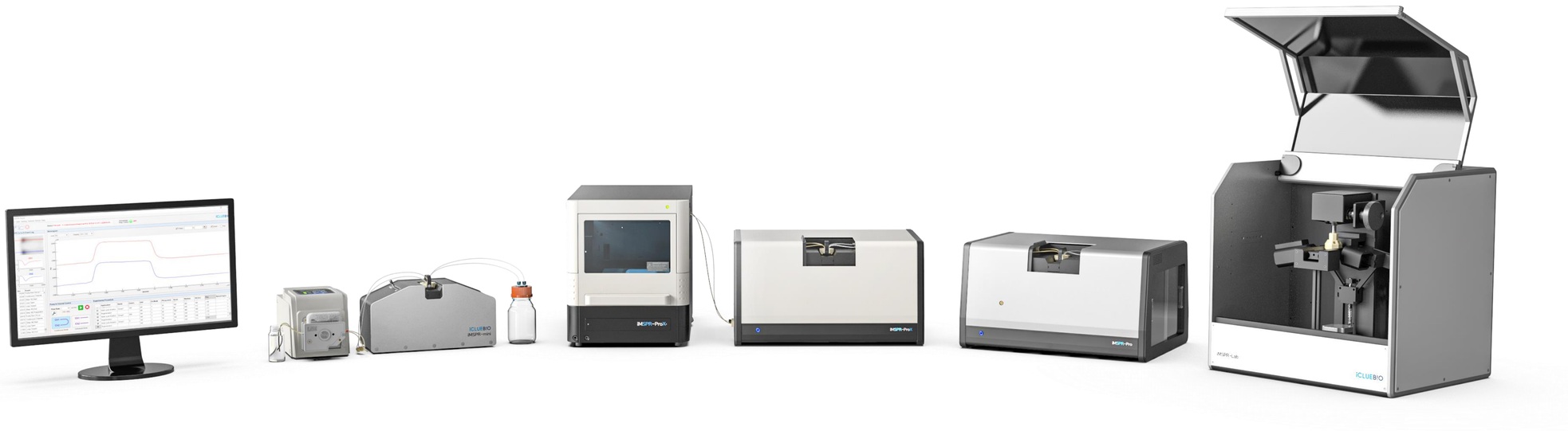
iMSPR

The Most Sustainable Molecular Interaction Analysis system

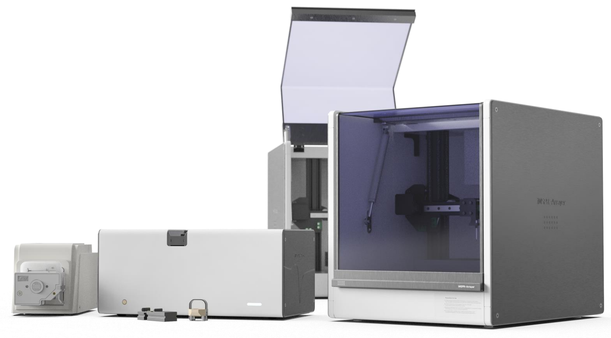
iCLUEBIO

iMSPR series

The iMSPR series is a real-time monitoring and analysis system for label-free intermolecular binding based on surface plasmon resonance (SPR) phenomenon. Through the iMSPR series, new biosensors, biomarkers, and receptors can be developed, or new drug candidates can be discovered. In addition, it can evaluate pharmaceutical quality and can be used for medical diagnosis. Experience the iMSPR series of various configurations, from the basic manual model iMSPR-mini to the fully automated advanced model iMSPR-Pro2X model.



What is your choice of iMSPR



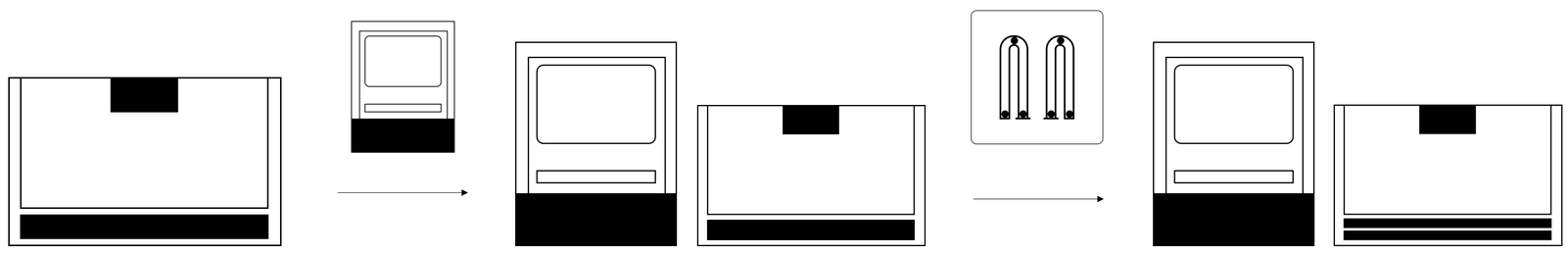
Model name	iMSPR-Pro2X	iMSPR-ProX	iMSPR-miniX	iMSPR-mini	iMSPR-PlexM
Cat. No	INPX2000	INPX1000	INMX1000	INMN2000	INPM1000
Channels	4	2	2	2	1
Channel type	UF type	U type	U type	I type	H type
Degasser	Yes	Yes	Optional	Optional	Yes
Operation guide	Yes	Yes	Yes	No	No
Automatic kinetics evaluation	Yes	Yes	Semi	No	No
Temperature Control for analysis	Yes	Yes	No	No	No
Sample injection	Autosampler	Autosampler	Autosampler	Manual injection using pump tubing	Manual injection using syringe
Noise level (single channel RMSE)	< 0.1 RU	< 0.1 RU	< 0.5 RU	< 0.5 RU	< 1 RU
Incident angle range	8	8	6	6	2
Multiplexing	2	No	No	No	Max 250
Applications	Drug Screening Concentration affinity Kinetics	Drug Screening Concentration affinity Kinetics	Yes/No Affinity Kinetics	Yes/No Affinity Sensor development	Screening Multiplex analysis Sensor development
GxP operation (21 CFR Part 11)	Yes (optional)	Yes (optional)	No	No	No
Recommended customers	Common facility Pharmaceutical company	Common facility Pharmaceutical company	Personal lab of university/ Research center	Personal lab of university/ Research center	Personal lab of university/ Research center

Why iMSPR

The most sustainable SPR system

You can start small to fit your budget. As time goes by, your needs grow, and your budget expands, you can simply upgrade to add new, powerful, and diverse features without having to buy a new product. If you choose the iMSPR Pro series, it means that it was the latest product when you first started, and you can still use the latest product today.

System upgrade



	Standard model with 2 flow cells	Automation model with 2 flow cells By adding Autosampler	Automation model with 4 flow cells, TCU By adding UFD fluidic By adding dual injector
Add applications			
	Yes/No Affinity Kinetics Thermodynamics	Yes/No Automatic and accuracy evaluations - Affinity - Kinetics - Thermodynamics Immobilization level control Screening (Max 15 samples/hr)	Yes/No Automatic and accuracy evaluations - Affinity - Kinetics - Thermodynamics Immobilization level control Screening (Max 30 samples/hr) 2 experiments simultaneously

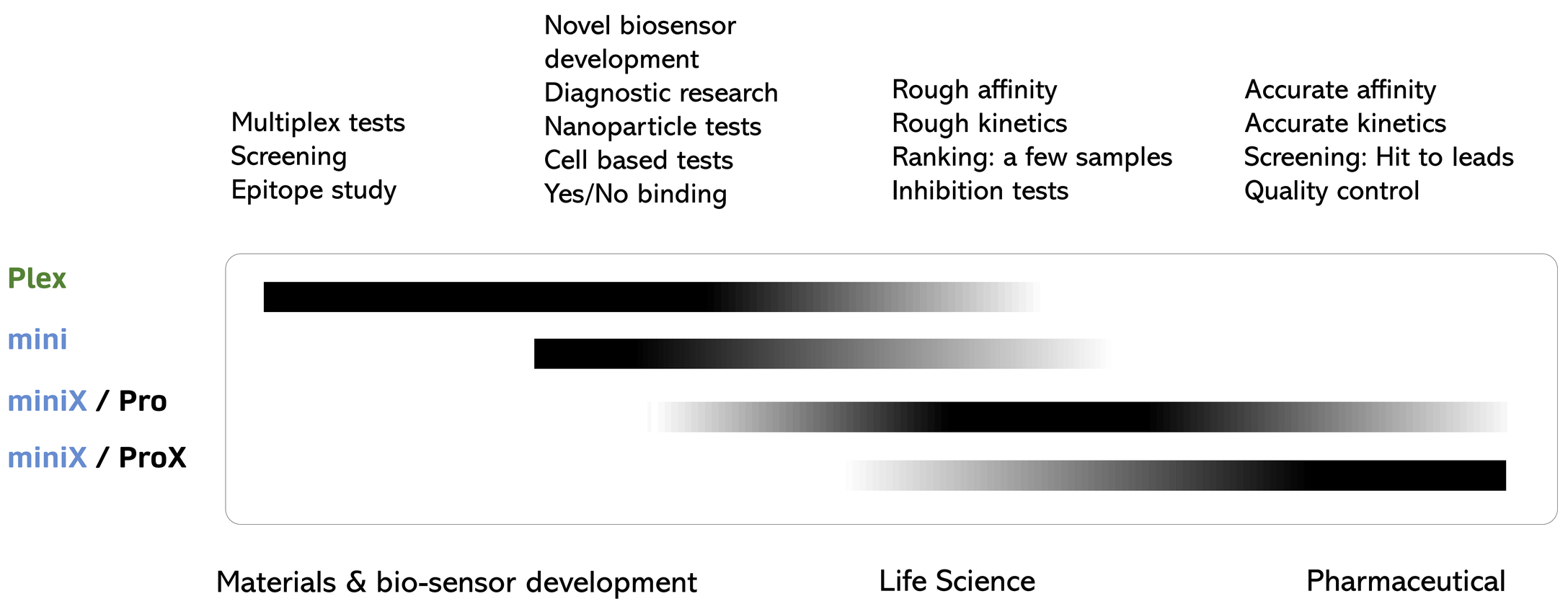
Long-life use by small maintenance

We've built all of our components to be durable so that you can use your iMSPR for as long as possible, or almost a lifetime. If you choose iMcare Plus, you can receive care for 10 years at a very small cost. It includes a two-year warranty, regular inspections every six months, software upgrades every year, one tubing replacement, and regular training every two years. (This is the standard within Korea, and each country has different iMcare policies.)

Warranty	Regular inspection	SW upgrade	Consumable Service	Operation training
2 year	Every 1/2 year	Every year	Every year	Every year

The best choice for various applications

The iMSPR series consists of a variety of models to accommodate a variety of applications. From new material characterization to new drug development and drug quality control, choose the iMSPR model that fits your needs.



iMSPR Pro Series

Contents

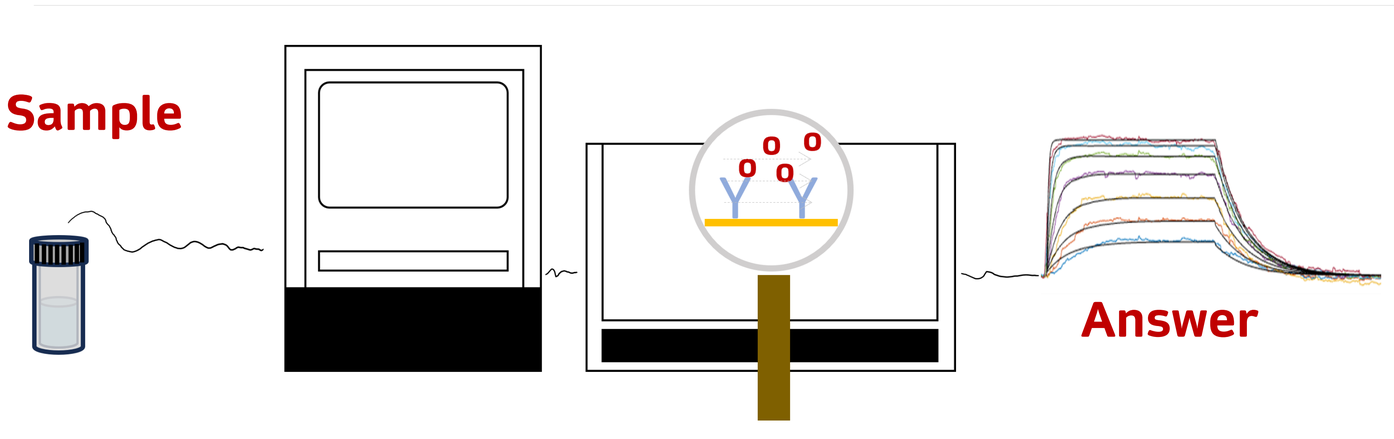
Fully automated interaction analysis without labeling

iMSPR Pro series is a **fully automatic analysis system** that can analyze intermolecular bindings based on SPR phenomena **in real time without labeling**. Pro series is a very suitable system for **high-volume screening of drug candidates and characterization of intermolecular binding**, which is an early stage of drug development. Of course, it can be used for various basic research related to intermolecular binding. Analytical materials range from proteins, peptides, nucleic acids, and even to small molecule compounds. In addition to this, the size spectrum of analytes is very wide, from large cells such as tumor cells, bacteria, viruses, and exosomes to small molecules with a size smaller than nanometers. The iMSPR Pro series has very few consumables that need to be replaced frequently due to the application of very robust and concise parts. This means that annual maintenance costs can be kept to a minimum.

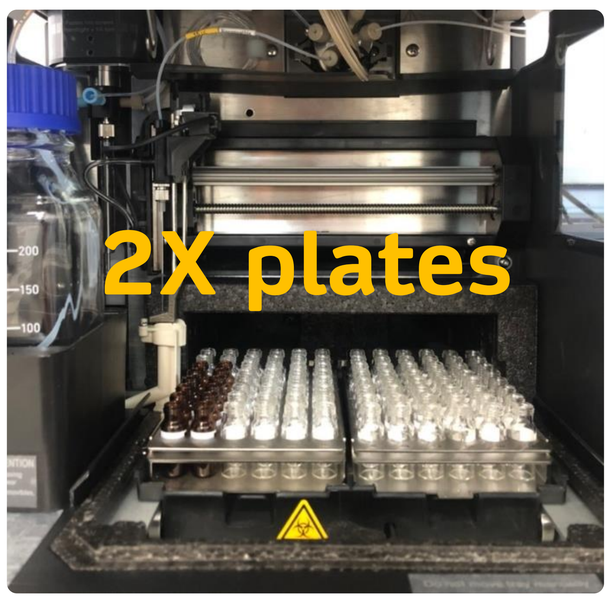
Core Features

Sample to Answer

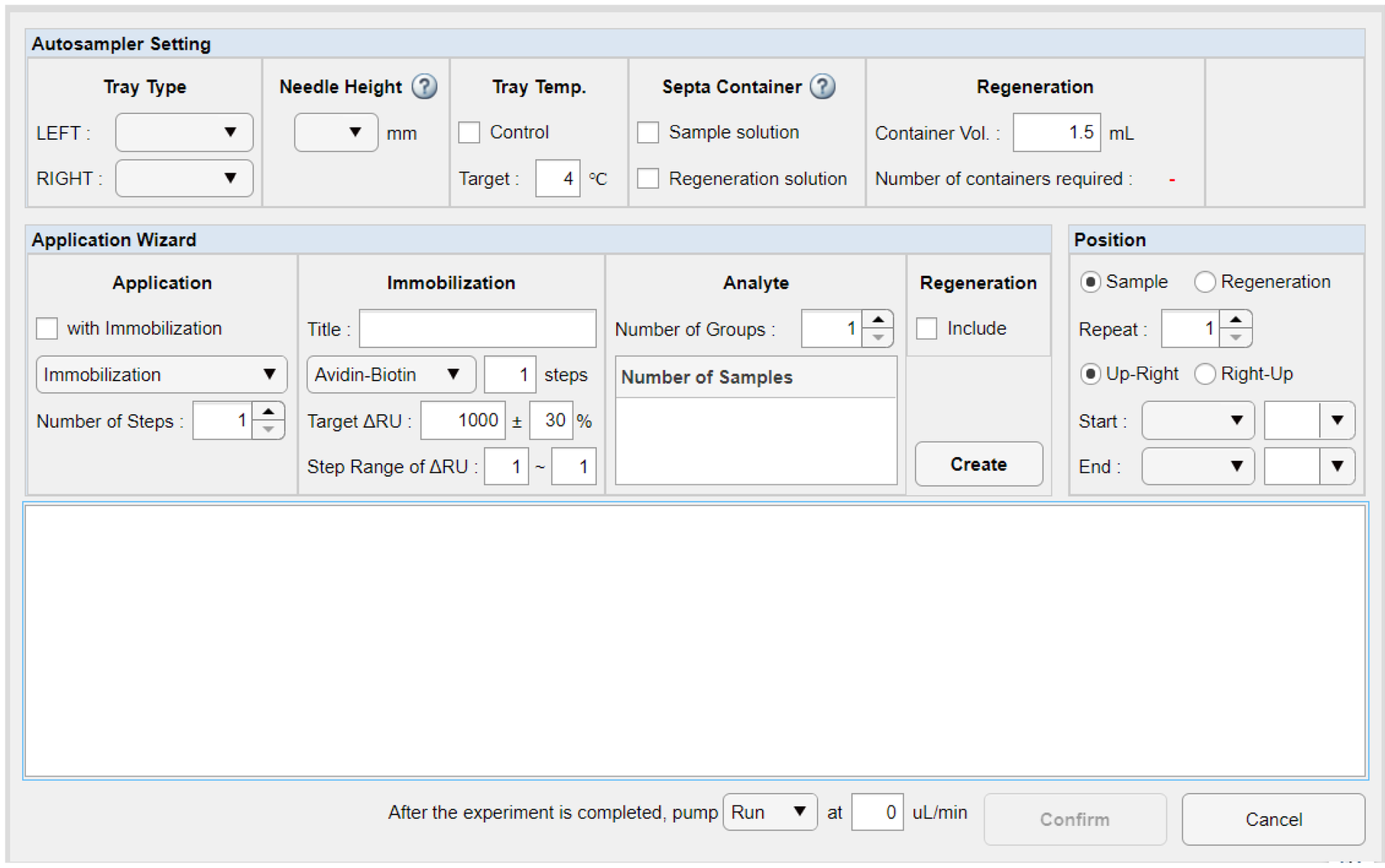
In the iMSPR-Pro series, you simply prepare samples and inject them into a sensor chip using an autosampler and a syringe, and the device will produce the desired result according to the set sequence, flow rate and channel mode.

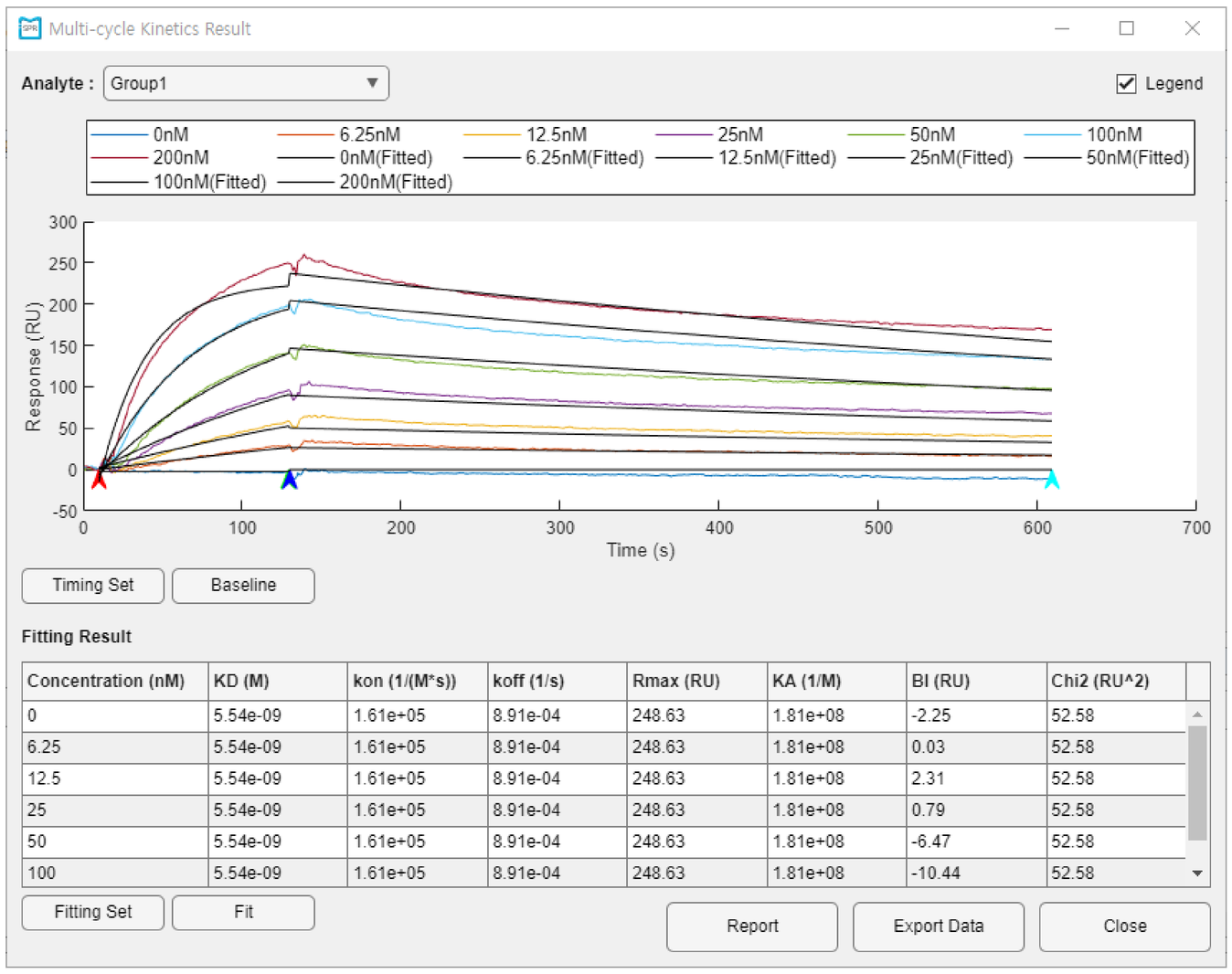


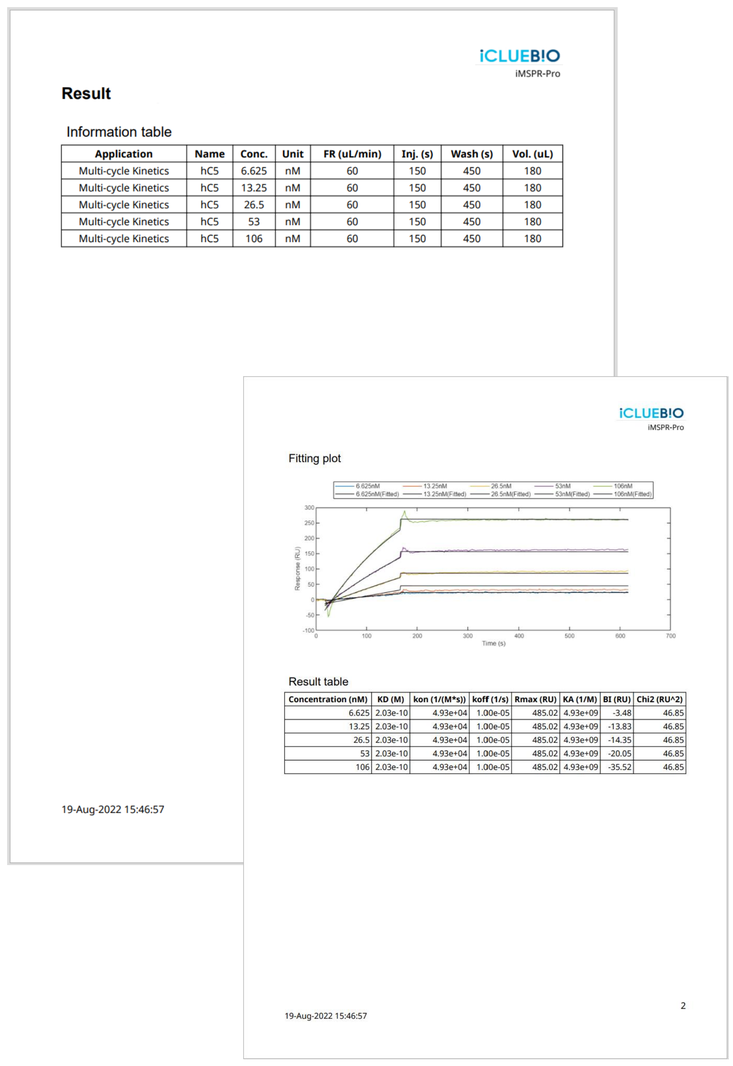
Sample: High-throughput Prepare reagents and ligands for immobilization in the standard rack of the autosampler, and prepare all kinds of samples for analysis. The standard 48 vials rack can accommodate up to 48 standard tubes in one tray. If you have more samples, you can use an additional rack to prepare them. The autosampler of iMSPR-ProX can be used with a 96 well plate as well as a 48 vials rack. It can also mount two racks or plates at the same time, processing up to 192 samples at a time.



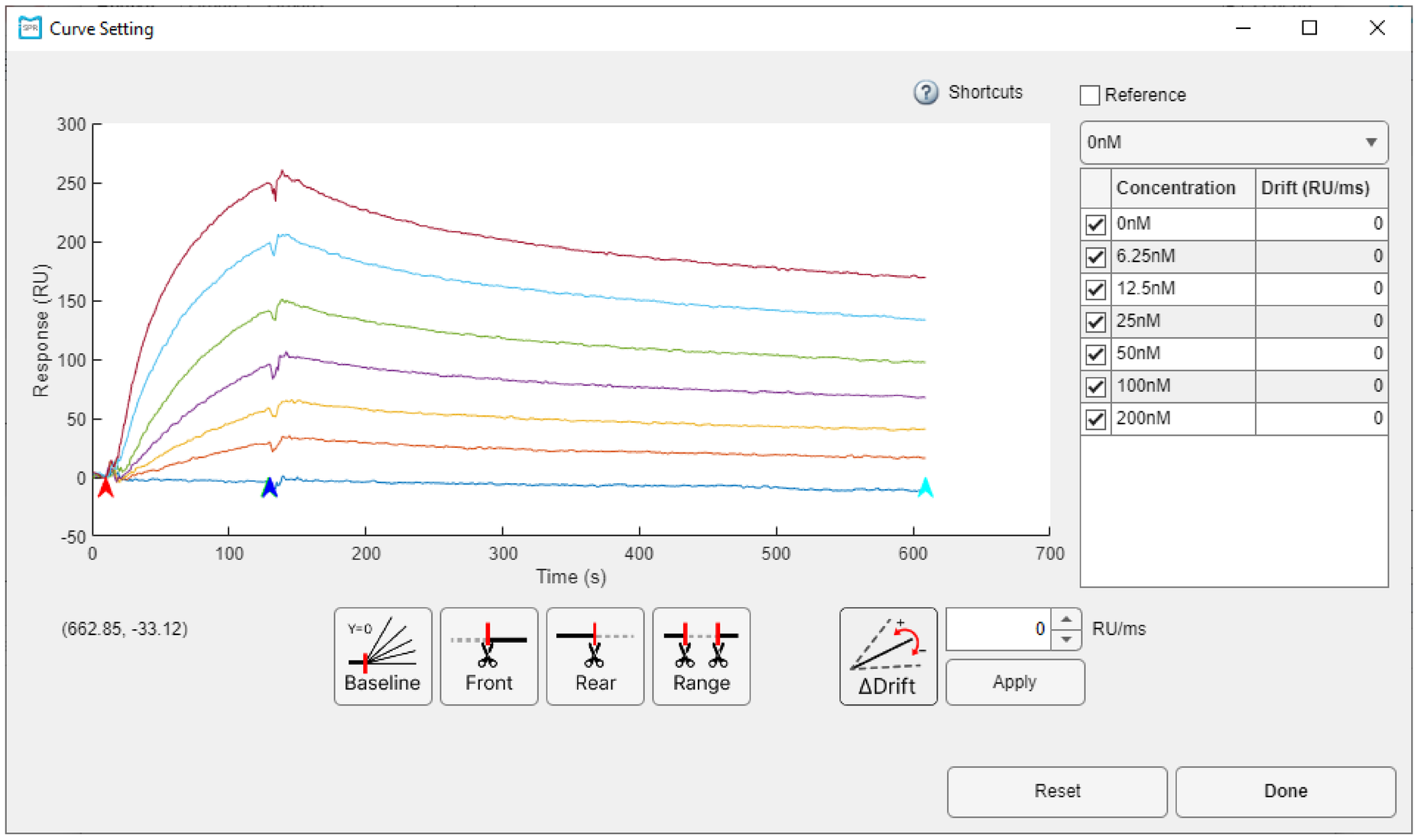
Experiment Wizard Simply write your experiment protocol according to your desired applications. If your sample is protein and you plan to run overnight experiments, turn on the autosampler tray temp. control function. It will help you proceed with the analysis while keeping your sample as safe as possible. Then write a wizard according to the immobilization method and the number of samples. Add regeneration if a regeneration step is required between samples. Through the smart program of the iMSPR Pro series, detailed experimental protocols can be written and various evaluations can be performed automatically.







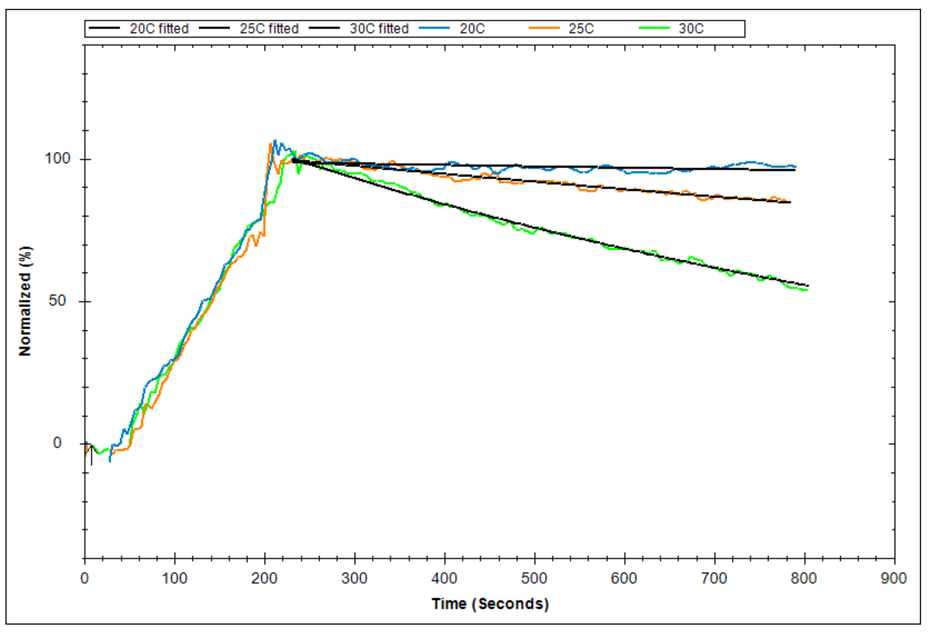
Answer: Automatic evaluation At the end of the experiment, iMSPR's smart analysis tool automatically performs a kinetics evaluation or steady state affinity evaluation after overlaying the sensorgrams of all the concentrations of the analytes you have run. After checking the result, you can print the result through the report button.

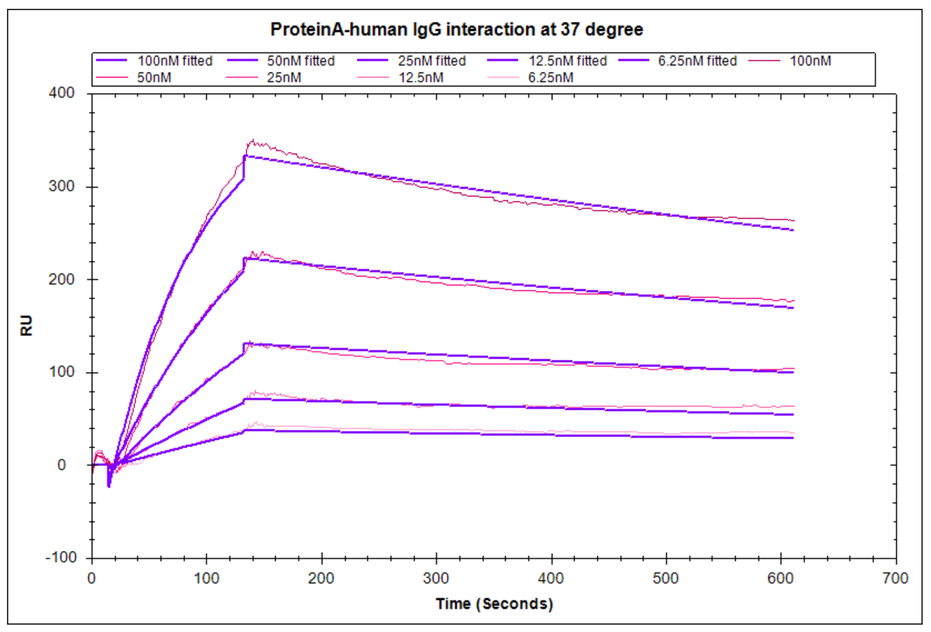


Easy to edit for more accuracy evaluation Now, there is no need to cumbersomely edit and analyze curves in a separate analysis tool after the experiment is over. Using the built-in iMSPR analysis tool, a curve referencing can be done with a blank concentration data, and drift correction is possible. In addition, you can easily remove outliers that may affect the results by removing spikes in the curve and using various editing functions.

Smart Thermal Balance: Compact Design, Adaptive Precision

The Contact-type Thermal Control Unit (**TCU**) of Pro series focuses on smart efficiency, delivering heat directly to where it’s needed, rather than relying on a massive air bath. This overcomes space constraints while efficiently delivering the practical data quality researchers require.



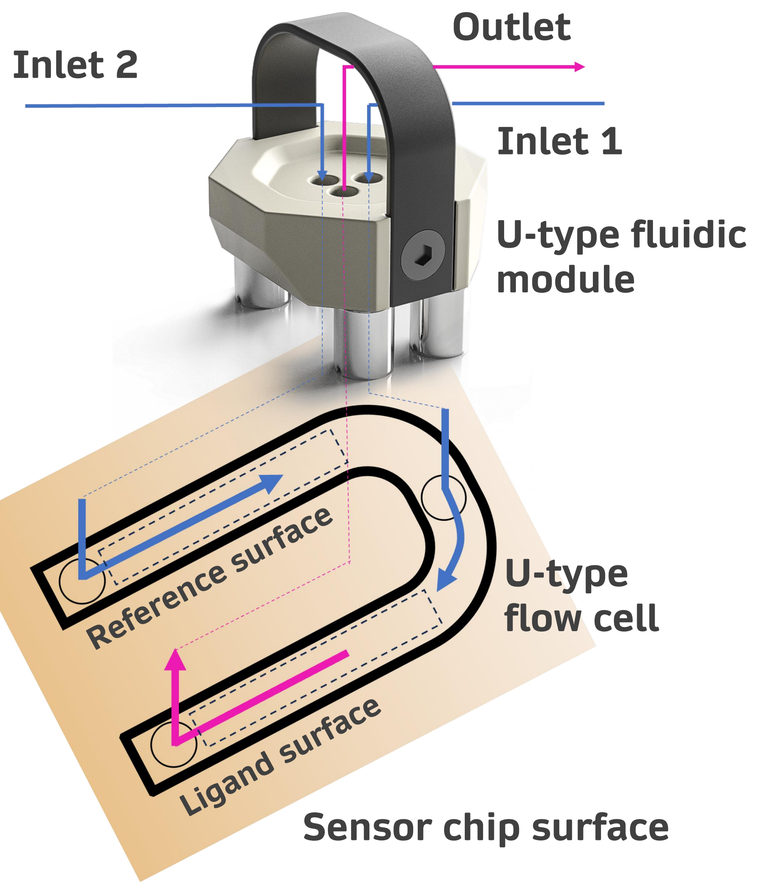


Thermodynamics and Physiological tests for additional information

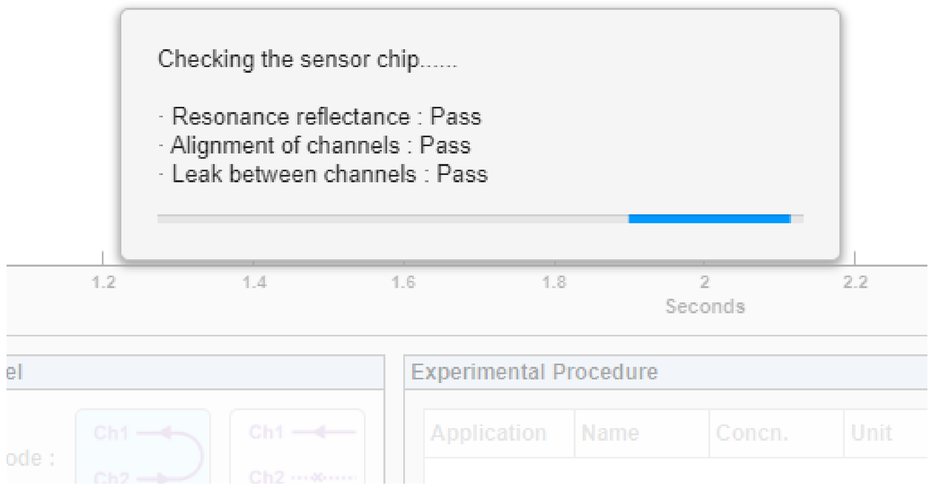
The TCU module can be set from 10 °C to 40 °C. Accordingly, you can proceed with kinetics evaluation at various temperatures, and as a result, obtain thermodynamic properties such as enthalpy and entropy as well as kinetics constants. And the interaction evaluation of drug candidates in a physiological environment will further lower the probability of clinical failure.

Most sustainable and sophisticated U-type fluidic module

The SPR analysis system basically immobilizes the ligand on the sensor surface and allows the analyte to pass over the ligand surface to generate a reaction and acquire a real-time sensorgram accordingly. Therefore, in the SPR analysis system, the fluidic module has a very important role, which allows the material to be precisely transferred to the sensor surface.
iMSPR’s U-type fluidic module can be used intuitively by users. And it is designed with the most robust and simplest design for maintenance free.



Special features for more perfect experiments

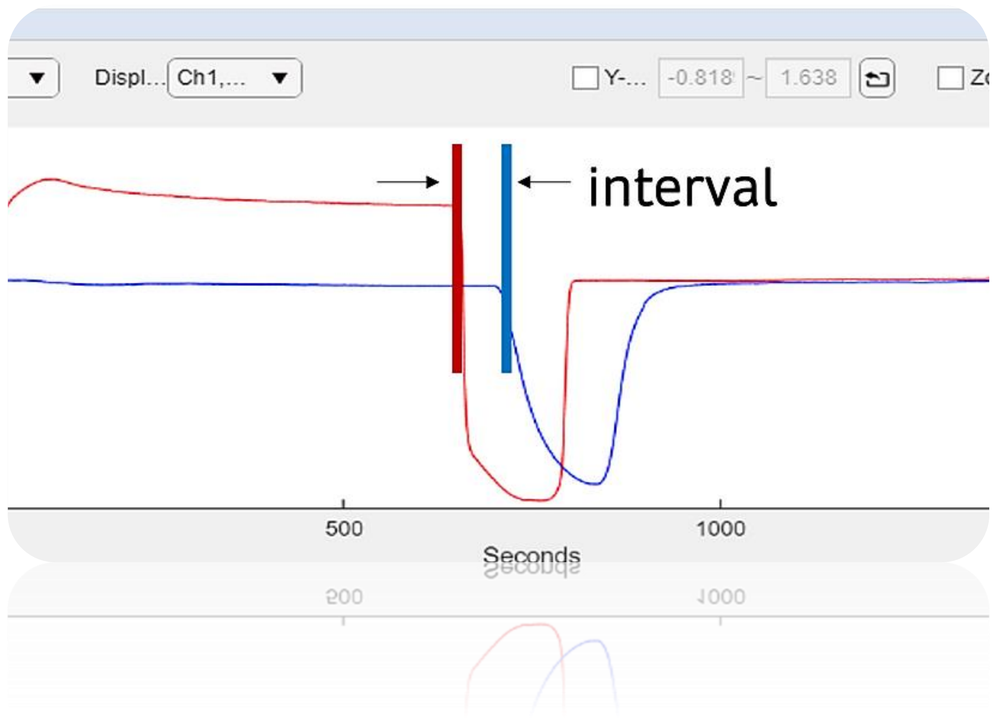


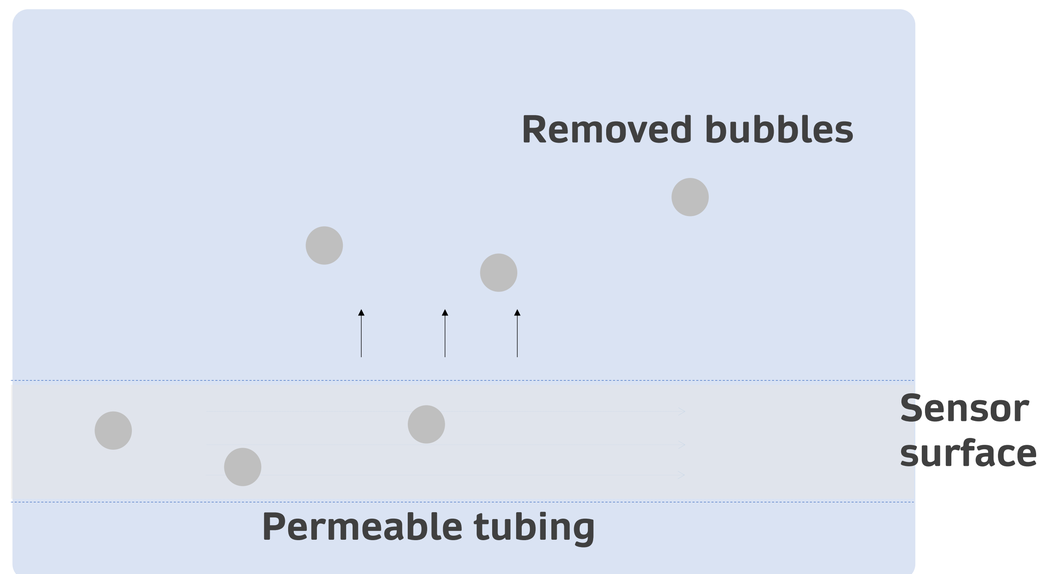
Sensor chip QC

The SPR analysis system uses a metal thin-film sensor chip with a high-tech membrane laminated surface. The iMSPR Pro series automatically evaluates the condition of the sensor chip and notifies you whether the new sensor chip is installed correctly, the surface is OK, and there are no bubbles trapped.

Minimizing interval

The offset correction is performed by automatically calculating the sample injection timing between channels so that you can check the more accuracy subtracted data in real-time during your experiment.



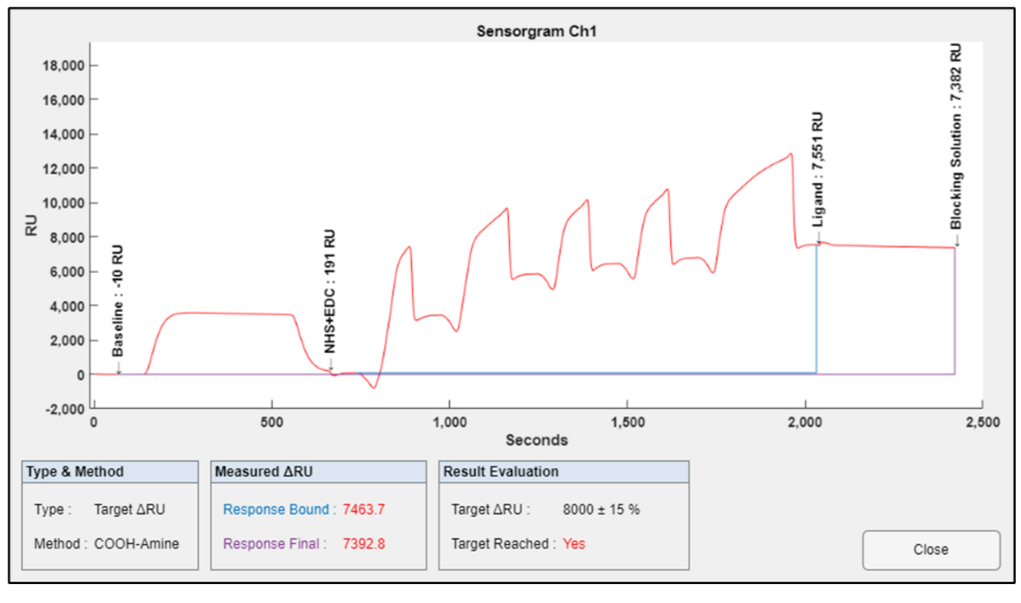


Real-time removing bubble and alarm of leakage

When analyzing SPR, the researcher should always be on the lookout for bubbles to be injected into the channel. iMSPR Pro series not only completely removes bubbles with its built-in real-time bubble removal system but also informs researchers about leaks occurring during the experiment using a self-developed algorithm and helps them to cope.

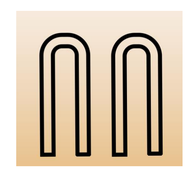
Smart immobilization

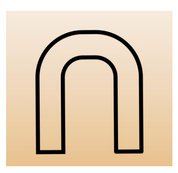
This function is a feature that allows the iMSPR system to automatically perform optimal immobilization based on the input target RU. This allows the experimenter to accurately and repeatedly achieve the desired level of immobilization without the need for manual monitoring and interruption.

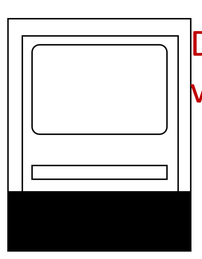


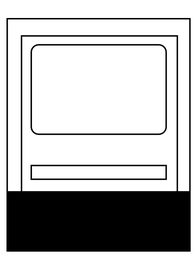
What are the differences

	Pro2X	ProX	Pro
Sample flow channel	4 Two experiments per chip	2 One experiment per chip	2 One experiment per chip
Fluidics module	**UFD fluidic module** with dual U-type flow cells	Standard fluidic module With mono U-type flow cells	Standard fluidic module With mono U-type flow cells
Sample injection	Autosampler with dual injection valve 48 vial rack x 2 96 well plate x 2 384 well plate x 2	Autosampler with mono injection valve 48 vial rack x 2 96 well plate x 2 384 well plate x 2	Syringe One by one injection
Sample volume (200 µl sample loop)	Max 200 µl Partial injection available 30 ~ 75 µl dead volume	Max 200 µl Partial injection available 30 ~ 75 µl dead volume	Max 200 µl Partial injection available 30 ~ 60 µl dead volume
Screening capacity (Maximum)	300 samples per day	150 samples per day	Not recommended
Smart immobilization	Yes	Yes	No

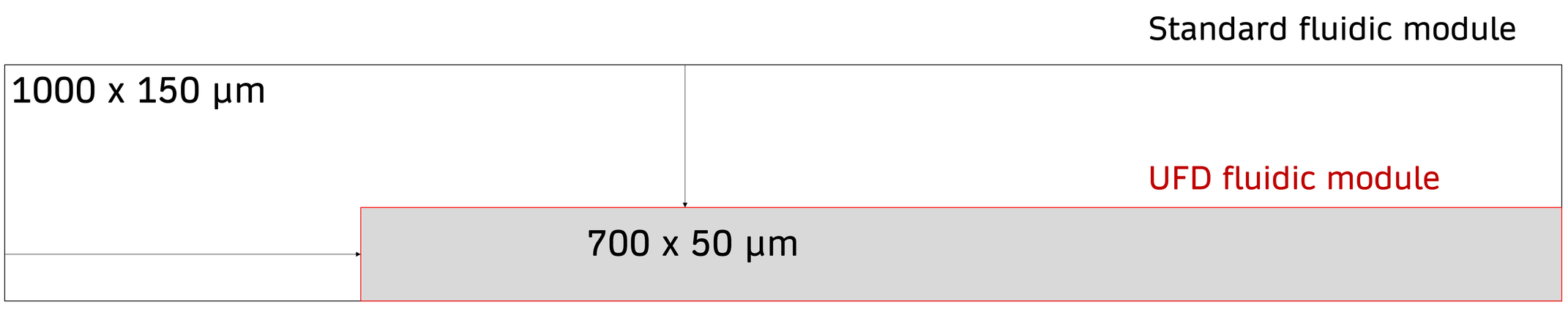








Ultra Fine Dual (UFD) fluidic module



Compare with standard fluidics

- 200 nl, 80% reduction of channel volume
- Interval-less referencing
- Lower consumption of sample
- More accurate leveling of immobilization

Specifications

	Pro2X	ProX	Pro
What's in the package (commons)	iMSPR-Pro main body (1 set), Prism holder (1 ea), Detach tool (1 ea), PC (1 pkg), Flat tweezer (1 ea), Matching oil (2 ml), USB cables, Power cable (1 ea)		
What's in the package (individuals)	UFD fluidic module (1 ea), autosampler with dual injection valve (1 pkg), 48 vials rack (1 ea), vials of 750 µl (100 ea)	Standard fluidic module (1 ea), autosampler (1 pkg), 48 vial rack (1 ea), vials of 750 µl (100 ea)	Standard fluidic module (1 ea), syringe of 250 µl (1 ea)
Warranty	1 year		

Main system (All model)	
SPR type	Angular interrogation
Light source	770 nm LED
Detector	2D CMOS sensor, 1/1.2", 2.35MP
Polarizer control	Auto
Incident light range	8°
RIU range	1.30 ~ 1.38
Association (k_a)/Dissociation (k_d)/Affinity range(K_D)	10^3 to 10^8 $M^{-1}s^{-1}$ / 10^{-5} to 0.5 s^{-1} / 10^{-3} to 10^{-13} M
Intrinsic Noise (single FC RMSE, Short-term)	< 0.1 RU
General analysis time/sample	2~15 min
Temperature range	10 ~ 40°C (±10°C of ambient temperature)
Device size Pack size	360 x 466 x 262 (mm), 20 kg 670 x 580 x 600 (mm), 33 kg
Power (Power consumption)	AC100-240 V (130 W)
Materials	100% recyclable Aluminum (more 90%), PEEK

Pump (Peristaltic)	
Channel No.	1 (Pro2X: 2)
Operation tubing	3-stop tubing, ID: 0.25 mm
Flow rate range	10~100 uL/min
Selection valve	Solenoid
Degasser volume	100 uL

Autosampler (ProX and Pro2X)	
Capacity	48 vials x 2, 96 well plate x2 384 well plate x2
Pump type, volume	Syringe, 500 µl
Injection valve, loop volume	6 ports - 2 ways, 200 µl (option 100, 500, 1000 µl)
Injection volume	20 to 200 µl (maximum volume depend on loop volume)
Required sample volume	Normal: Injection volume + 30 µl Air gap: Injection volume +75 µl
Sample storage temperature	4°C below ambient temperature
Power	100-240 V (200 W)
Communication	RS232
Device size Pack size	300 x 575 x 360 (mm), 25 kg 720 x 490 x 600 (mm), 30 kg

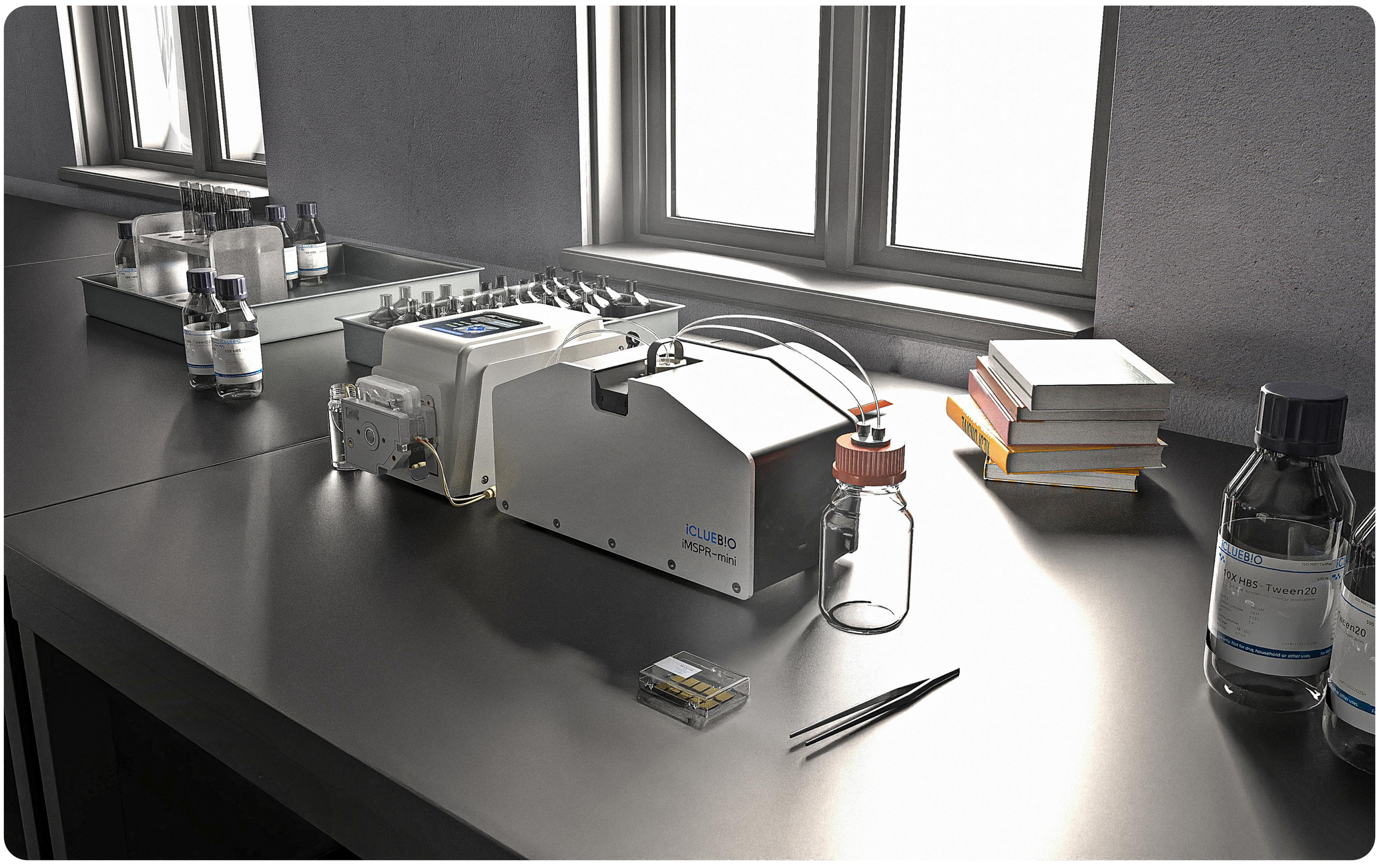
PC	
CPU	i5
RAM	16G
Operation	Window, iMSPR OS
Power	AC100~240V

iMSPR-ProX and Pro2X is capable of supporting operation in GXP and 21 CFR Part 11 in compliance with regulatory demands.

iMSPR-mini

Contents

The most reasonable label-free interaction analysis

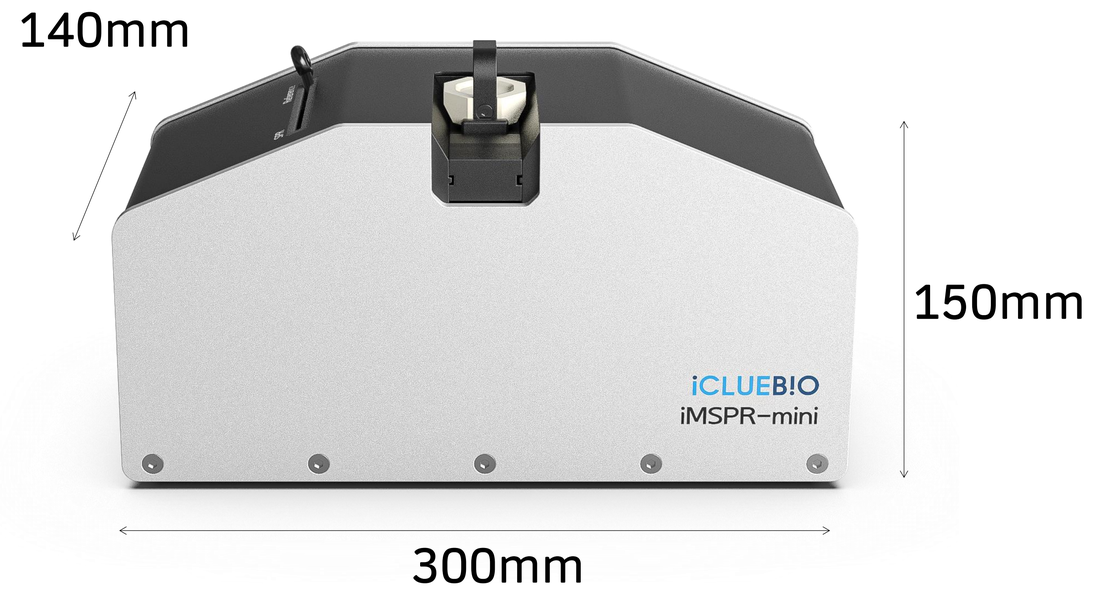


icluebio has been thinking about an SPR sensor that can be used **flexibly for various applications** for researchers, product developers, and medical fields, etc. It should be as small as possible so that it can be **installed anywhere**, it should be **easy to connect** to other systems, and it should be simple so that **anyone can use** it.
This is the reason why the iMSPR-mini was born.
mini is an open platform built to do anything you can imagine. Just connect to your mobile PC via USB and you can use it right away without additional power supply. By using the mini, you can accurately understand the phenomenon of surface plasmon resonance (SPR) and use it intuitively.

From the small but powerful iMSPR-mini
expand your research as much as you want.

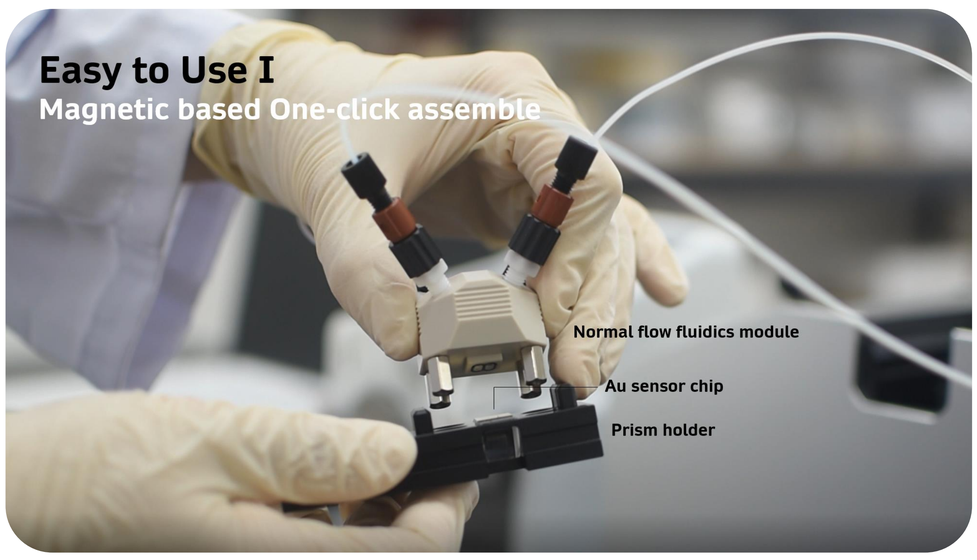
Compact sized,
Incredible SPR system
iMSPR-mini

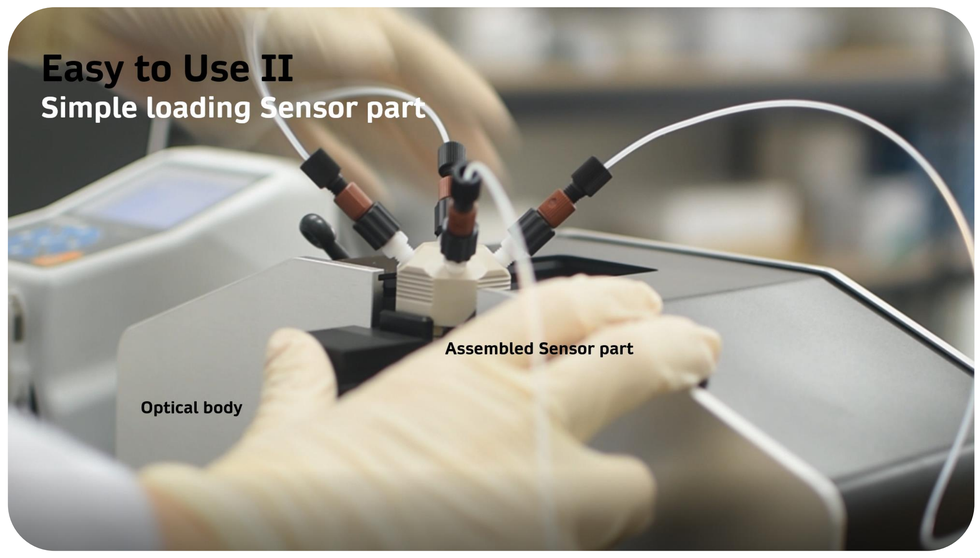
mini is SPR itself. mini is the basis of the iMSPR series. Its optical platform is shared by all iMSPR models, and the signal to noise ratio also shows the same performance. All the core parts of the SPR sensor are integrated in a very compact body, and electronic parts are minimized.



Wherever you want mini does not require power supply using an additional cable. Via a USB connection to a mobile PC, the mini stays awake and measures signals in real time. That means you can take the mini wherever you want and never have to search for a power.

Whoever can access the mini. mini is easy. Magnetic-based fluidics assembly technology makes SPR systems accessible to anyone. After connecting the fluidics module to the prism holder and inserting it into the body of the mini, it is ready to use.





One mini, Infinite Potential

iMSPR-mini, Standard

This model comprises a fluidic module with two flow cells and a peristaltic pump with two channels. Samples can be injected through each tubing of the pump, and depending on the purpose of the experiment, you can do two independent experiments or set up a control group to conduct the test. With this configuration, it is possible to simply confirm the yes or no binding, perform small-quantity screening, or conduct rough kinetics experiments.

iMSPR-miniR, Extreme model

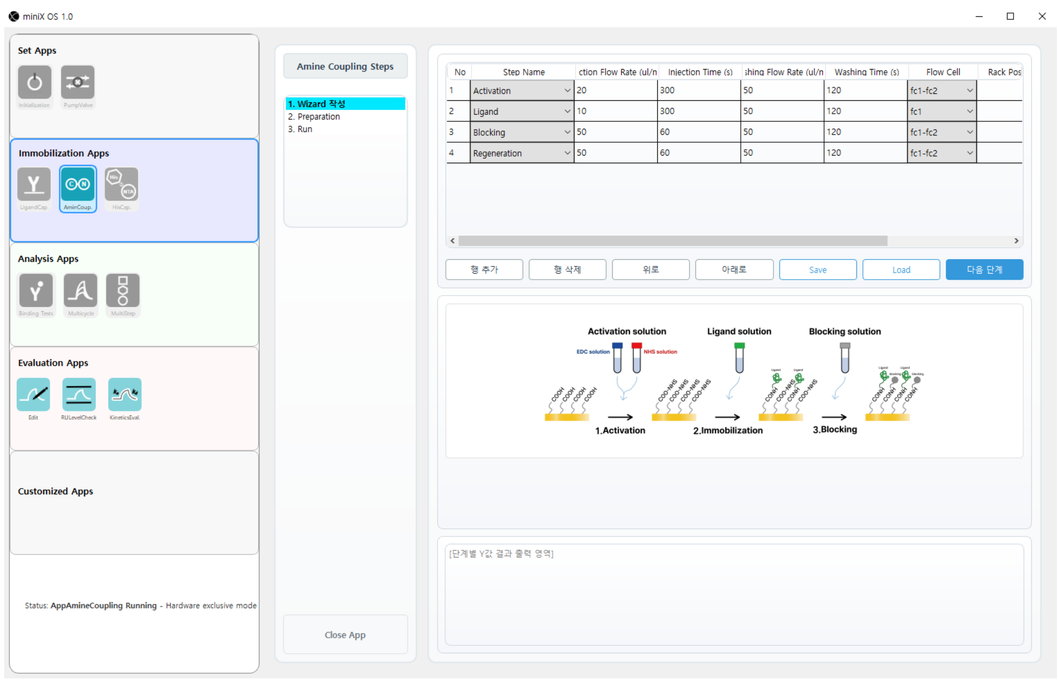
While maintaining the core functionalities of the Standard model, this edition features **high-refractive index prisms** and **ultra-chemical resistant components (Tubing & O-rings)**. It ensures flawless stability not only in common aqueous buffers but also in **high-RI organic solvents like Toluene**. Experience the optimal SPR solution designed specifically for advanced materials and semiconductor development.

Small start,
Big possibilities.
miniX

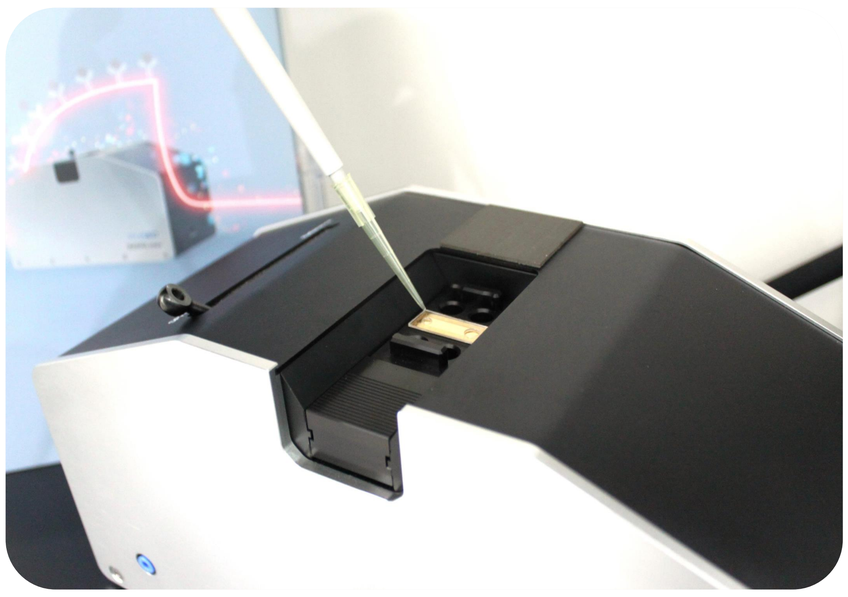
Connecting the miniX dedicated autosampler to the mini enables more accurate and reproducible analyses. The miniX autosampler can process up to 20 750µl vials and up to three 25ml reagent bottles simultaneously, allowing kinetic analysis of four samples in a single run.

The miniX OS allows for easy initial setup, measurement, and analysis using a variety of apps.

The miniX is ideal for small sample analysis, labor-intensive screening, kinetic assessment and affinity analysis, and applications requiring high precision. The miniX is the most affordable automated SPR analysis system on the market.



Whatever / Wherever you want

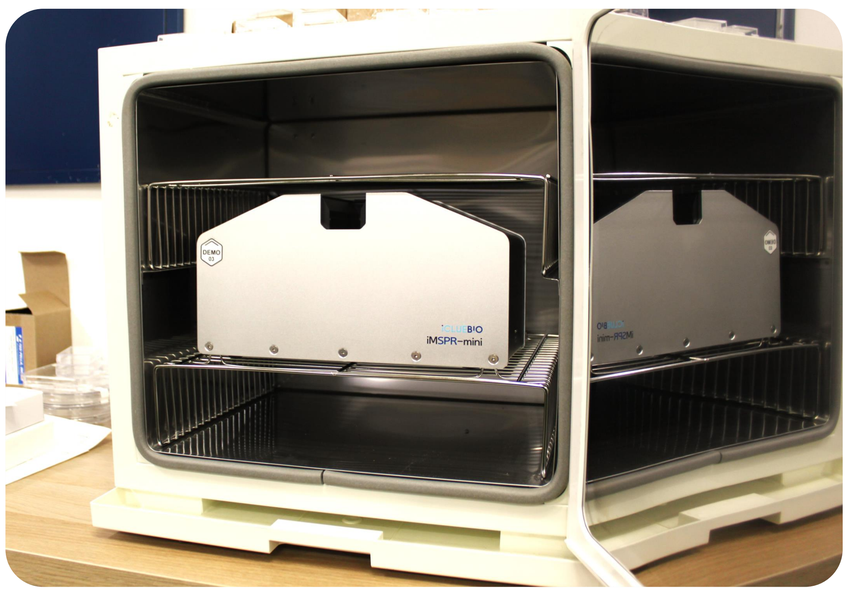


Diagnostic platform device

Based on the mini SPR optic system, you can develop fluidic modules with any design you want according to your purpose. Through this, it is possible to conduct research using real samples such as whole blood. Now, use mini to creatively measure biomarkers for disease diagnosis in the blood.

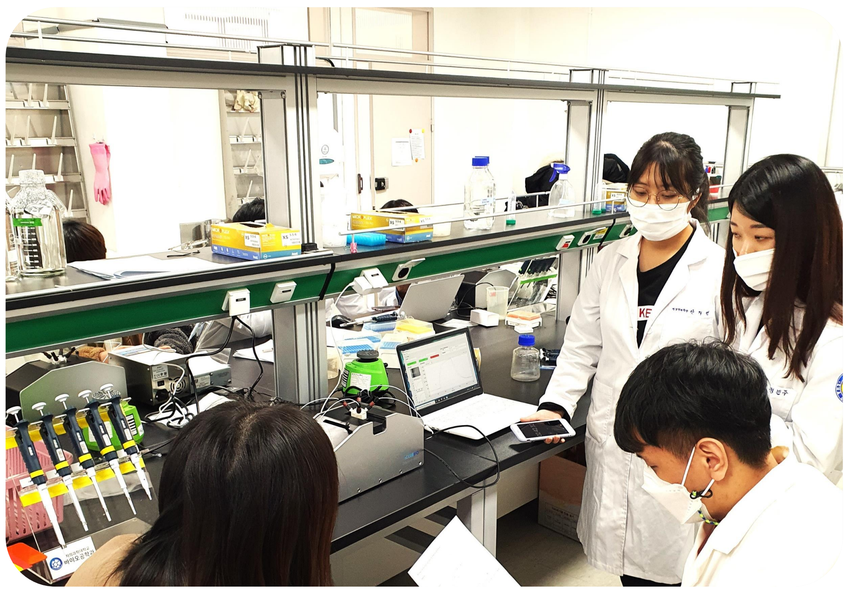
At physiological environment

It is very important to evaluate the binding of your target substance and new drug candidate at 37°C. Simply place the mini in your dry oven and run the experiment in a physiological temperature environment. More information will reduce your trial and error.



In cooling chamber

If your analytes and immobilized materials are temperature sensitive and have poor temperature stability, you may need to run them in a cooling chamber for long runs. Simply put the mini into the cooling chamber and carry out the experiment with peace of mind. You can proceed with the evaluation without your substance being denatured.



On site education

SPR biosensors are now essential devices rather than optional. In particular, it not only plays a very important role in pharmaceutical development but is also used in the quality control of biopharmaceuticals like antibody therapeutics. mini is designed to understand the principle of SPR, and several units can be installed in a small space.
Install iMSPR-mini in the practice space for your future professional people.

References

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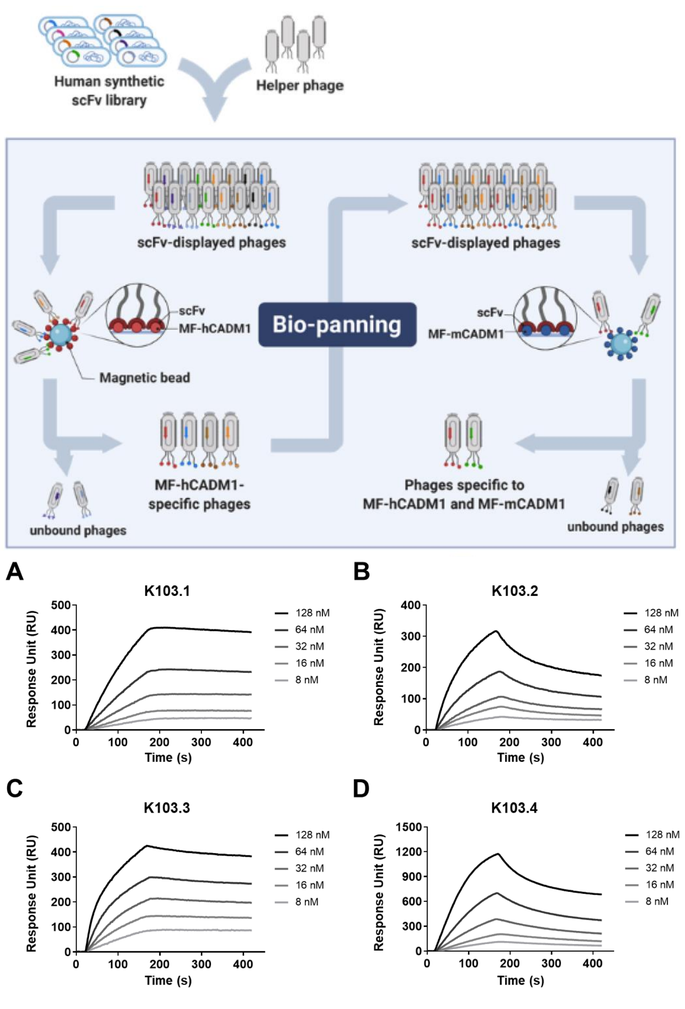
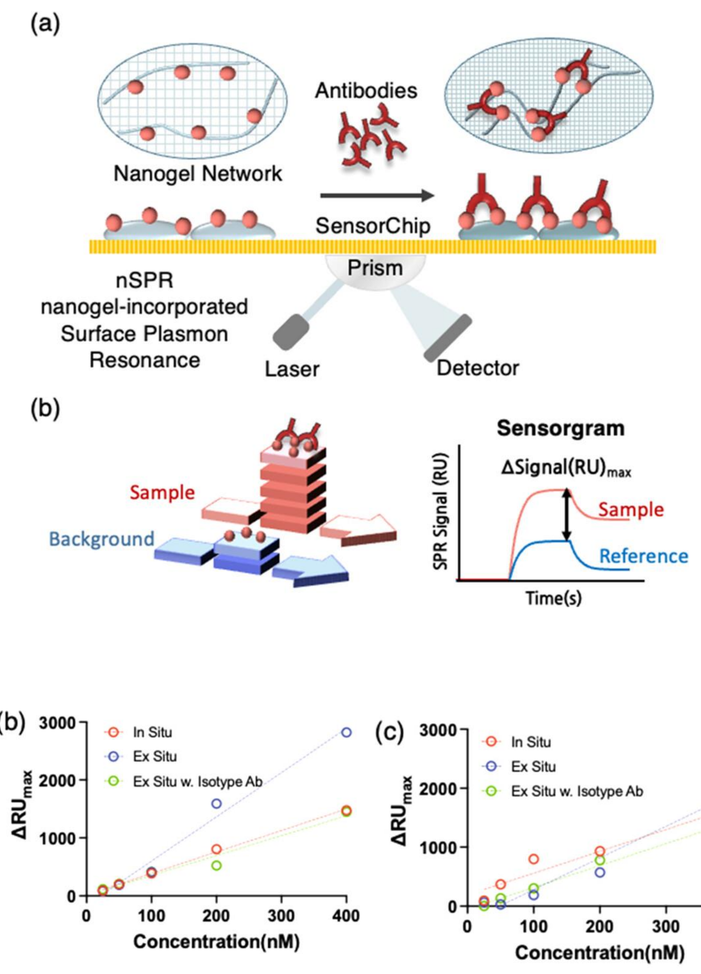
An internalizing antibody targeting of cell surface GRP94 effectively suppresses tumor angiogenesis of colorectal cancer, Biomedicine & Pharmacotherapy 150 (2022) 113051

Antibody characterization



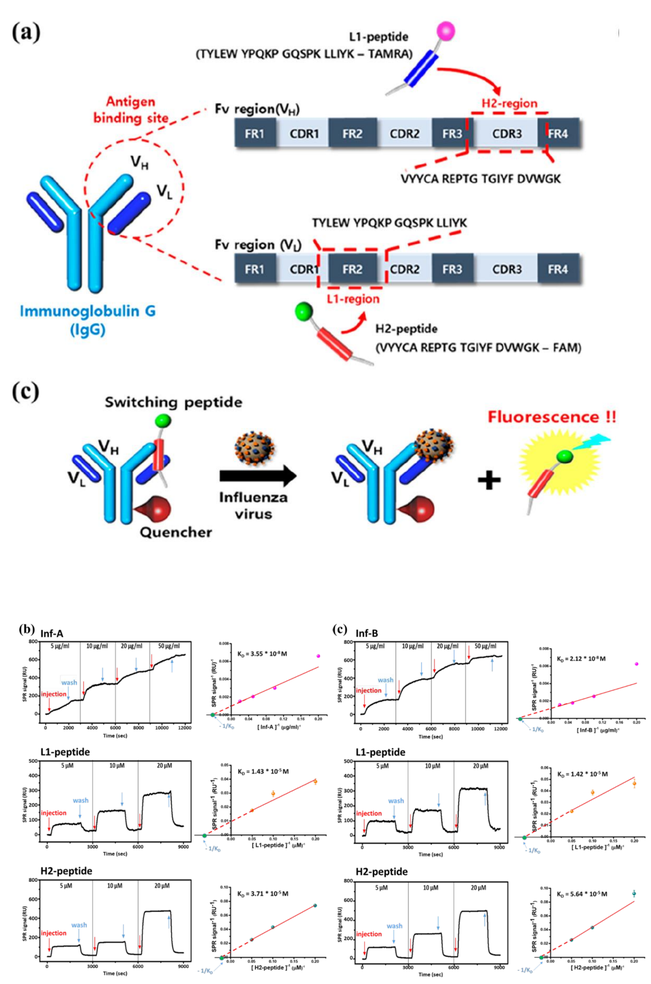
Biomedicines, 10(12), 2022, 3174

Neutralized Ab detection



ACS Appl. Polym. Mater. 2023, 5, 3, 2195

New assay development



Anal. Chem. 2022, 94, 27, 9627–9635

Specifications
mini & miniR

	mini	miniR
What's in the package (commons)	iMSPR-mini main body (1 set), Prism holder (1 ea, standard), Detach tool (1 ea), PC (1 ea), SW (1 cp), Flat tweezer (1 ea), Matching oil (2 ml), USB cable (1 ea)	
What's in the package (individuals)	Peristaltic pump with 2 channels (1 set), I-type flow cells (1ea)	Peristaltic pump with 2 channels and high resistance tubings (1 set), I-type flow cells with high resistance O-rings (1 ea), Prism holder with high refractive index prism (1 ea)
Warranty	1 year	

SPR type	Angular interrogation, Prism coupling
Channels/ Channel volume	2 channels (individual), 500 nl
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 (Standard)	1.32 ~ 1.38
RIU range (Extreme)	1.29 ~ 1.35 & 1.48~1.54
Affinity range	pM ~ mM
Intrinsic Noise (single FC RMSE, Short-term)	< 0.5 RU
General analysis time/sample	2~15 min
Main application	Yes/No binding, Rate on/off constants / Equilibrium constant (required evaluation SW), Biosensor development, Academic, Diagnostics
Analytes	Proteins, DNA/RNA, Peptides, Small compounds, Polysaccharides, Lipids, Viruses, Cells
Device size Pack size	306 x 140 x 156 (mm), 6 kg 470 x 260 x 310 (mm), 7 kg
Power	5V USB3.0
Materials	Aluminum (more 90%), PEEK

Pump (Peristaltic)	
Channel No.	2
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	AC 100 ~ 240V

PC	
CPU	i5
RAM	8G
Operation	Window, iMSPR OS
Power	AC100~240V

Specifications
miniX

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

Main system	
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 to 10^7 $M^{-1}s^{-1}$ / 10^{-5} to 0.5 s^{-1} / 10^{-3} to 10^{-12} M
Noise level (single channel RMSE)	< 0.5 RU
General analysis time/sample	2~15 min
Device size Pack size	306 x 140 x 156 (mm), 6 kg 470 x 260 x 310 (mm), 7 kg
Power (Power consumption)	5V USB3.0
Materials	100% recyclable Aluminum (more 90%), PEEK

Autosampler	
Capacity	20 vials (750 µl), 3 bottles (25 ml)
Pump type, volume	Syringe, 500 µl
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
Power	100-240 V (200 W)
Communication	USB
Device size Pack size	390 x 430 x 420 (mm), 20 kg 670 x 580 x 600 (mm), 33 kg

Pump (Peristaltic)	
Channel No.	2
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	AC 100 ~ 240V

PC	
CPU	i5
RAM	8G
Operation	Window, miniX OS
Power	AC100~240V

iMSPR-Plex

Contents

Multi-array based label-free interaction analysis

Revolutionary Multi-Array SPR System: iMSPR-PlexM
iMSPR-PlexM is an advanced SPR system designed for comprehensive multi-molecular binding analysis. With the ability to perform **multiplexing assays** of **up to 250 analytes on a single chip**, it delivers **high-volume data in an exceptionally short time** using only minimal sample amounts. By utilizing iMSpot, an automated spotter model developed by icluebio and optimized for SPR sensor chips, users can conveniently produce sensor chips with ligands arranged in customized configurations, tailored to their specific experimental needs. PlexM is the optimal choice for screening candidate substances in the early stages of drug discovery and ensures highly efficient analysis in epitope studies and Fc receptor testing for antibody drugs.

Experience the future of bioanalysis with iMSPR-PlexM – where precision meets innovation.

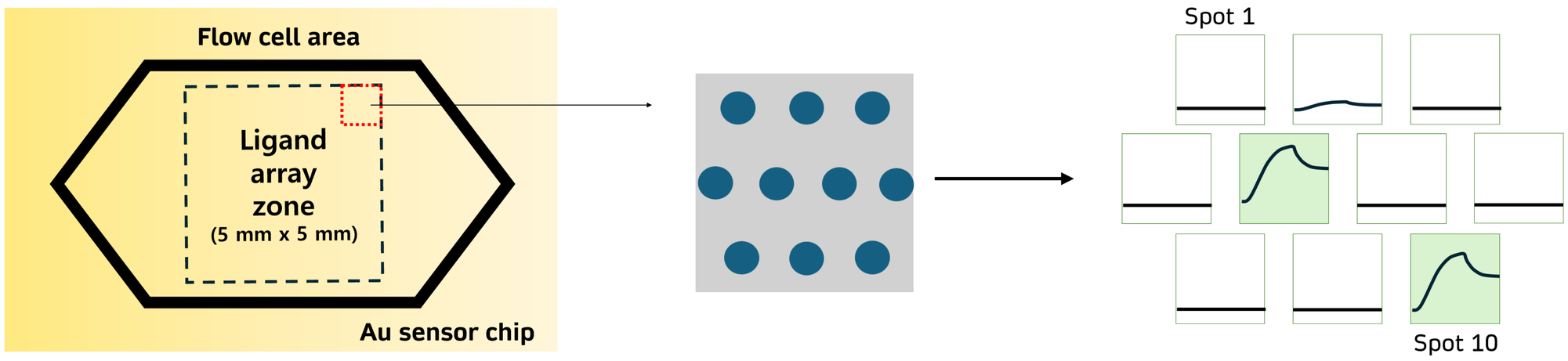
Core Features

up to
250
interactions

for
10
minutes

less
1
microliter

With iMSpot, users can immobilize or capture ligand materials on the sensor chip in a precise spot pattern, tailored to their experimental needs. Using a 80 µm pin, up to 10 spots per unit area and a maximum of 250 spots can be arranged within a compact 5 x 5 mm ligand array zone. Once the sensor chip with ligand spots is mounted on the iMSPR PlexM, simply inject the analyte. This cutting-edge system enables the observation of up to 250 molecular interactions in just 10 minutes, offering unparalleled efficiency and throughput.



up to 250 spots/chip

10 spots/ unit area

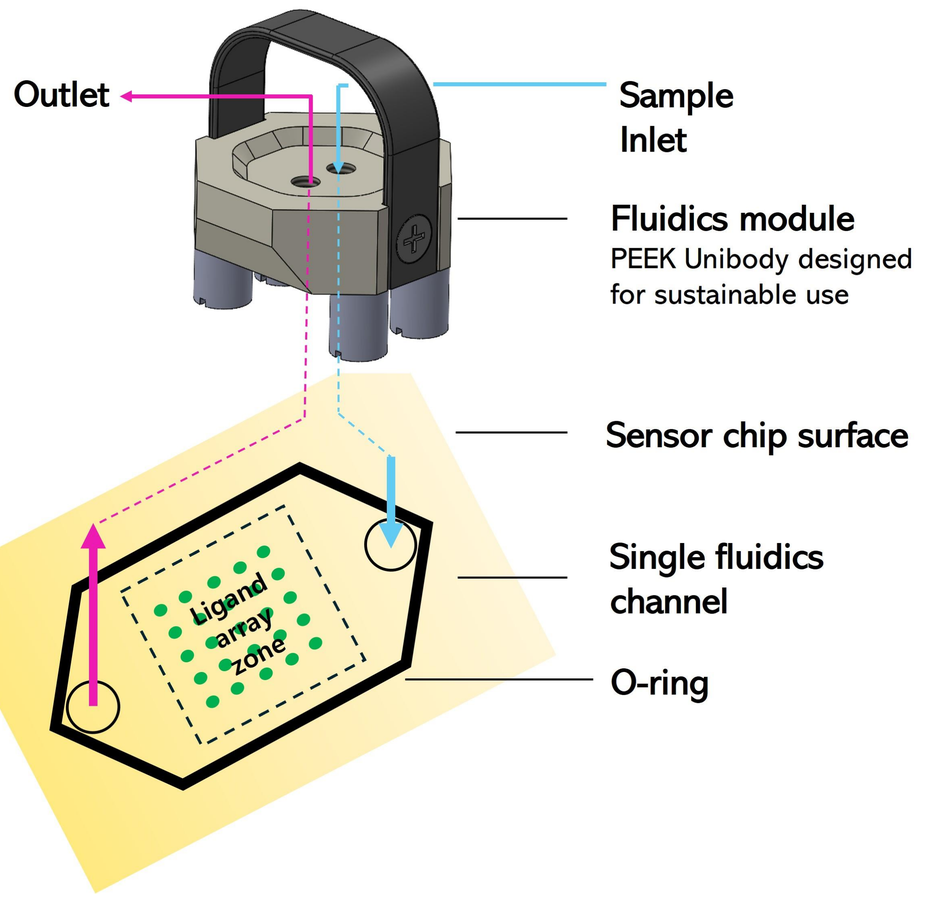
Multi-sensorgrams in 10 min

Maximize Efficiency with Minimal Ligand Usage

Traditional SPR systems typically require around 200 µL to immobilize ligands in a single channel at concentrations ranging from 1–100 µg/mL. In contrast, iMSPR-PlexM revolutionizes this process with pin spotting technology, enabling the immobilization of multiple ligands on a single chip using less than 1 µL of sample at concentrations between 10–1000 µg/mL. With iMSPR-PlexM, you can significantly reduce ligand consumption while achieving precise and efficient results.

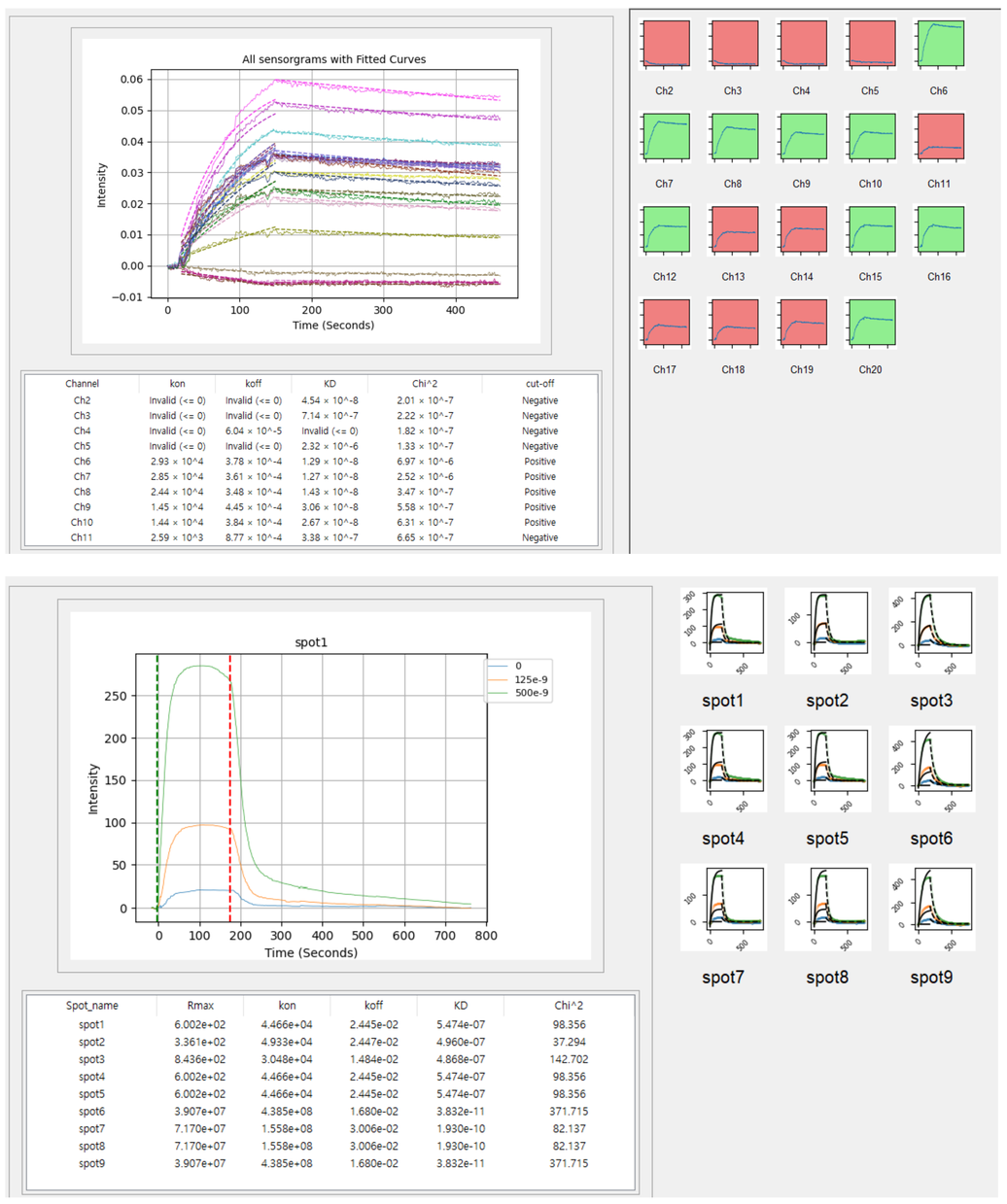
Sustainable hexagon type fluidics modules

Through the hexagon(H)-type fluidics module, binding reactions can be performed with multiple ligands at once in a continuous flow manner. In addition, the H-type fluidics module can be used semi-permanently because it is manufactured as a PEEK-based unibody.



Streamline Drug Discovery with Advanced Kinetics Screening

The single-concentration kinetics screening function is highly effective during the early stages of drug discovery. Substances that meet or exceed the user-defined cut-off points for binding yield and kinetics values are highlighted in green, enabling users to easily identify hits from a large number of samples. For more precise evaluations, the system also supports experiments using multiple ligands at varying concentrations with a single analyte, delivering greater accuracy and deeper insights than single-concentration screening alone.



Channel	kon	koff	KD	Chi^2	cut-off
Ch2	Invalid (<= 0)	Invalid (<= 0)	4.54 × 10^-8	2.01 × 10^-7	Negative
Ch3	Invalid (<= 0)	Invalid (<= 0)	7.14 × 10^-7	2.22 × 10^-7	Negative
Ch4	Invalid (<= 0)	6.04 × 10^-5	Invalid (<= 0)	1.82 × 10^-7	Negative
Ch5	Invalid (<= 0)	Invalid (<= 0)	2.32 × 10^-6	1.33 × 10^-7	Negative
Ch6	2.93 × 10^4	3.78 × 10^-4	1.29 × 10^-8	6.97 × 10^-6	Positive
Ch7	2.85 × 10^4	3.61 × 10^-4	1.27 × 10^-8	2.52 × 10^-6	Positive
Ch8	2.44 × 10^4	3.48 × 10^-4	1.43 × 10^-8	3.47 × 10^-7	Positive
Ch9	1.45 × 10^4	4.45 × 10^-4	3.06 × 10^-8	5.58 × 10^-7	Positive
Ch10	1.44 × 10^4	3.84 × 10^-4	2.67 × 10^-8	6.31 × 10^-7	Positive
Ch11	2.59 × 10^3	8.77 × 10^-4	3.38 × 10^-7	6.65 × 10^-7	Negative

Spot_name	Rmax	kon	koff	KD	Chi^2
spot1	6.002e+02	4.466e+04	2.445e-02	5.474e-07	98.356
spot2	3.361e+02	4.933e+04	2.447e-02	4.960e-07	37.294
spot3	8.436e+02	3.048e+04	1.484e-02	4.868e-07	142.702
spot4	6.002e+02	4.466e+04	2.445e-02	5.474e-07	98.356
spot5	6.002e+02	4.466e+04	2.445e-02	5.474e-07	98.356
spot6	3.907e+07	4.385e+08	1.680e-02	3.832e-11	371.715
spot7	7.170e+07	1.558e+08	3.006e-02	1.930e-10	82.137
spot8	7.170e+07	1.558e+08	3.006e-02	1.930e-10	82.137
spot9	3.907e+07	4.385e+08	1.680e-02	3.832e-11	371.715

Specifications of iMSPR-PlexM

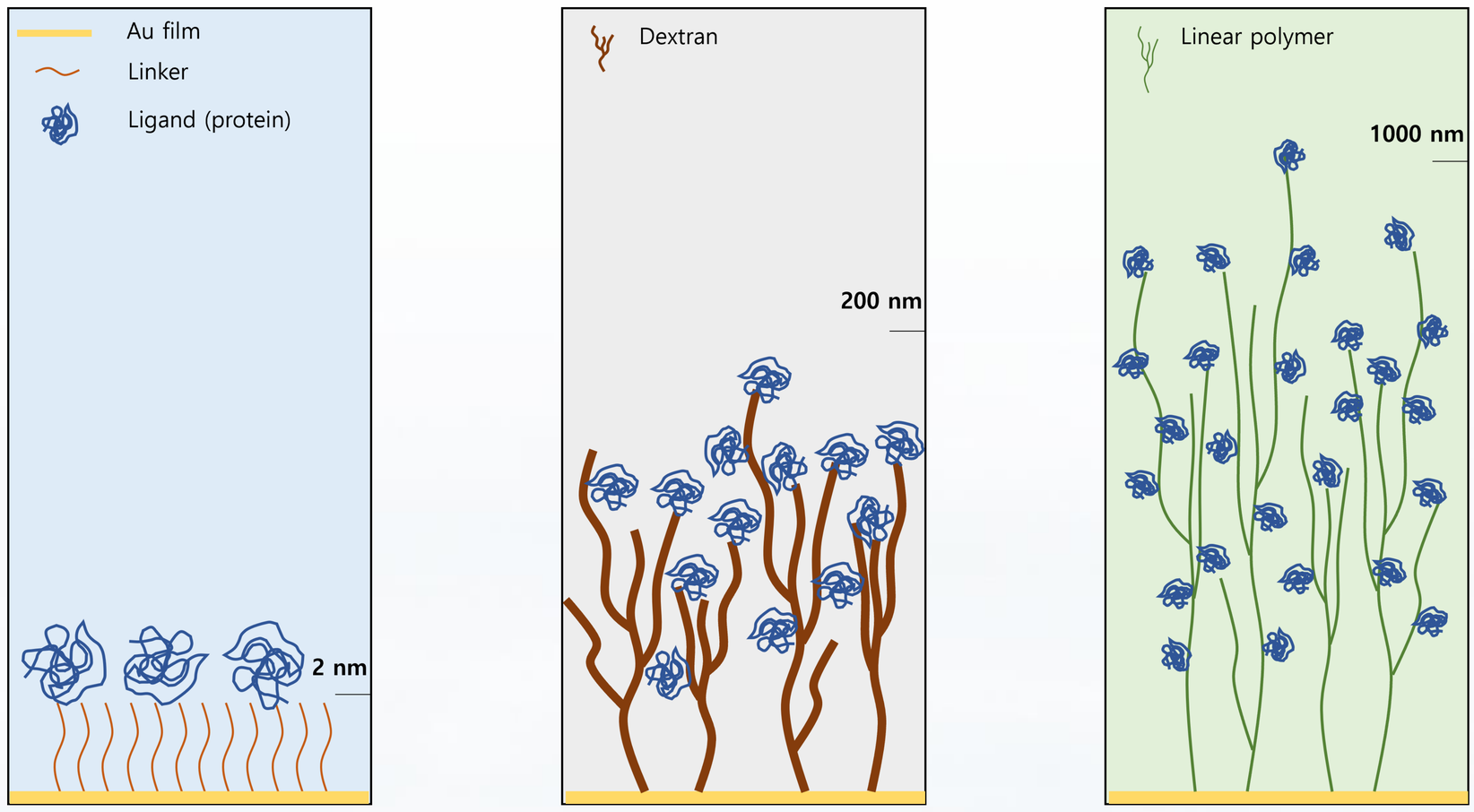
Including	iMSPR-PlexM main system (1 set), Peristaltic pump with single channel (1 set), Degasser with single channel (1 set) H-type Fluidics module (1 ea), Prism holder (1 ea), Detach tool (1 ea), PC (1 pkg), Flat tweezer (1 ea), Matching oil (2 ml), USB cable (1 ea)
Warranty	1 year
SPR type	Reflect intensity measurement at fixed angle
Flow cell / Volume	1 FC, 3 µl
Light source	770 nm LED
Detector	2D CMOS image sensor, 1/1.8”, 3.2 MP, Pixel size: 3.45 um
Incident light range	Fixed angle
Affinity range	pM ~ mM
Intrinsic Noise (single FC RMSE, Short-term)	< 1 RU
General analysis time/sample	2~15 min
Sample injection	Syringe, one by one injection
Sample loop volume	200 µl, partial injection available
Main application	Yes/No screening, Rate on/off constants, Epitope mapping/binning, Biosensor development, Academic, Diagnostics
Analytes	Proteins, DNA/RNA, Peptides, Small compounds, Polysaccharides, Lipids, Viruses, Cells
Power	100-240 volt
Materials	Aluminum (more 90%), PEEK

Specifications of iMSpot

Including	iMSpot main system (1 set), Xtend array pin (200 μm 1ea), USB cable (1 ea) , Power cable (1 ea)
Warranty	1 year
Number of pin	1
Pin Diameters	80, 130, 200, 300, 500 μm (Xtend array pin)
Axis resolution	± 10 μm
Capacity of chips	12 (10 x 14 mm, 12 x 12 mm)
Capacity of well plate	1
Well plate types	384 (standard), 96
Maximum spots in 1mm x 1mm (max)	10
Maximum spots in one chip (max)	250 (80 μm pin) 100 (200 μm pin) 50 (300 μm pin)
Humidity control	Yes (Wetted media type)
Cooling	No
Pin wet washing	Yes
Volume of wash buffer	1.5 ml / wash tube
Number of wash tube	6
Pin dry	Yes (using vacuum)
Communication	USB
Power	100-240 volt

Sensor chips guide

icluebio sensor chips are designed to be applied to a variety of applications. We offer a wide range of sensor chip surfaces - types, functional groups, densities and thicknesses. The surface of the sensor chip has to be determined the type of analyte, the size of the analyte, the ligand immobilization method, non-specific adsorption, etc.

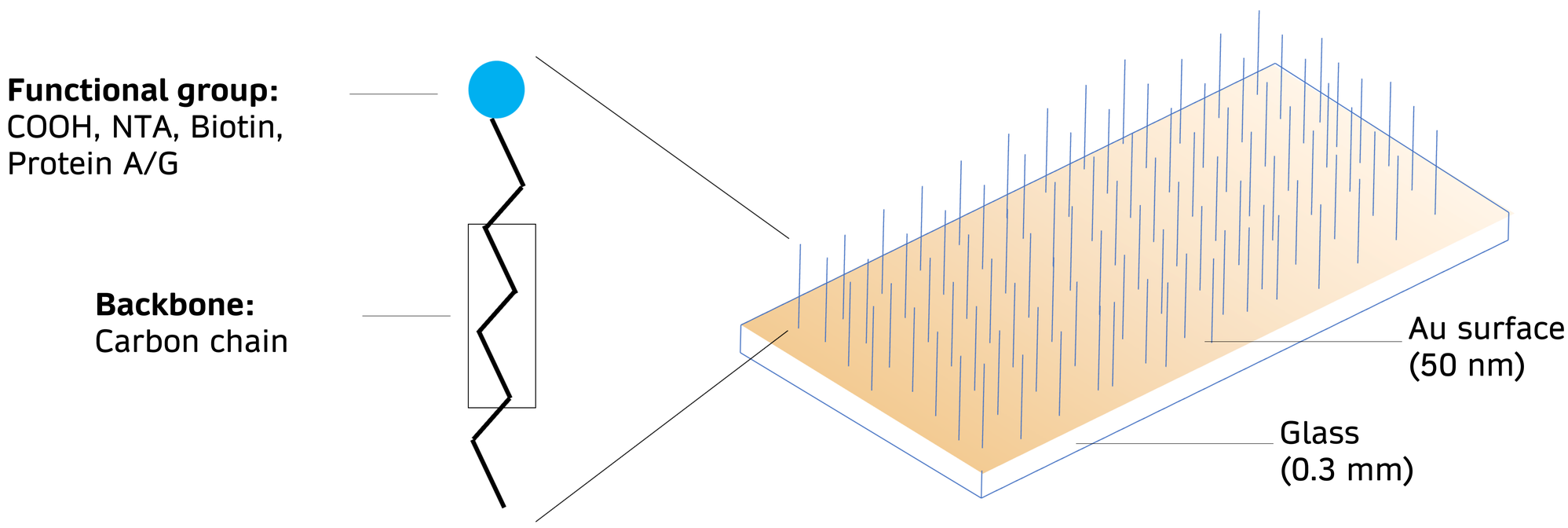


	2D surface	3D-Dextran	3D-Linear hydrogel
Linker	Self-assembled monolayer	Dextran	Linear polymer
Thickness	< 10 nm	100 nm	> 100 nm
Functional group	Bare, COOH, Biotin, NTA Avidin, Protein A/G	COOH, Avidin, Protein A/G	COOH, NTA
Glass Size	14x10x0.33 mm	14x10x0.33 mm	12x12x0.33 mm
Glass material	BK7	BK7	BK7
Adhesive	Cr	Cr	Cr
Metal layer	Au	Au	Au
Linker material	Alkan-thiols	Dextran	Linear polymer
Immobilization level	Low	High +	High +
Non-specific adsorption	Moderate	Low	Low

Alkanthiols based planar sensor chips

Since the iMSPR system has sufficient sensitivity, satisfactory results can be obtained even on a sensor chip (Planar Au sensor chip) formed with a monolayer of linker material that can immobilize the ligand in the case of a molecule with a relatively large size (about 5 kDa or more) – protein, cell, bacteria, virus, exosome, etc. In particular, in the case of antibody drugs, it is a very suitable application field because the signal is large and the affinity is high.

Structure



Immobilization level (Max.)

100 ~ 2000 RU (molecule type and MW dependent)

Recommend analytes

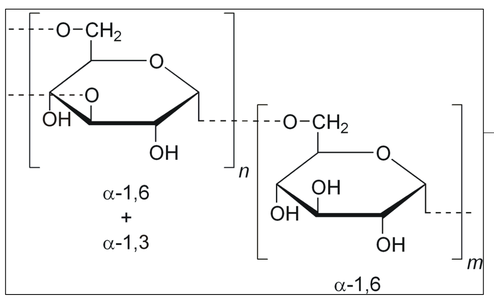
1 kDa	10 kDa	100 kDa	10~500 nm
Small compounds	Oligomers Peptides	Small proteins	Macro sized proteins Antibodies	Vesicles Virus Nano particles

Dextran based membrane sensor chips

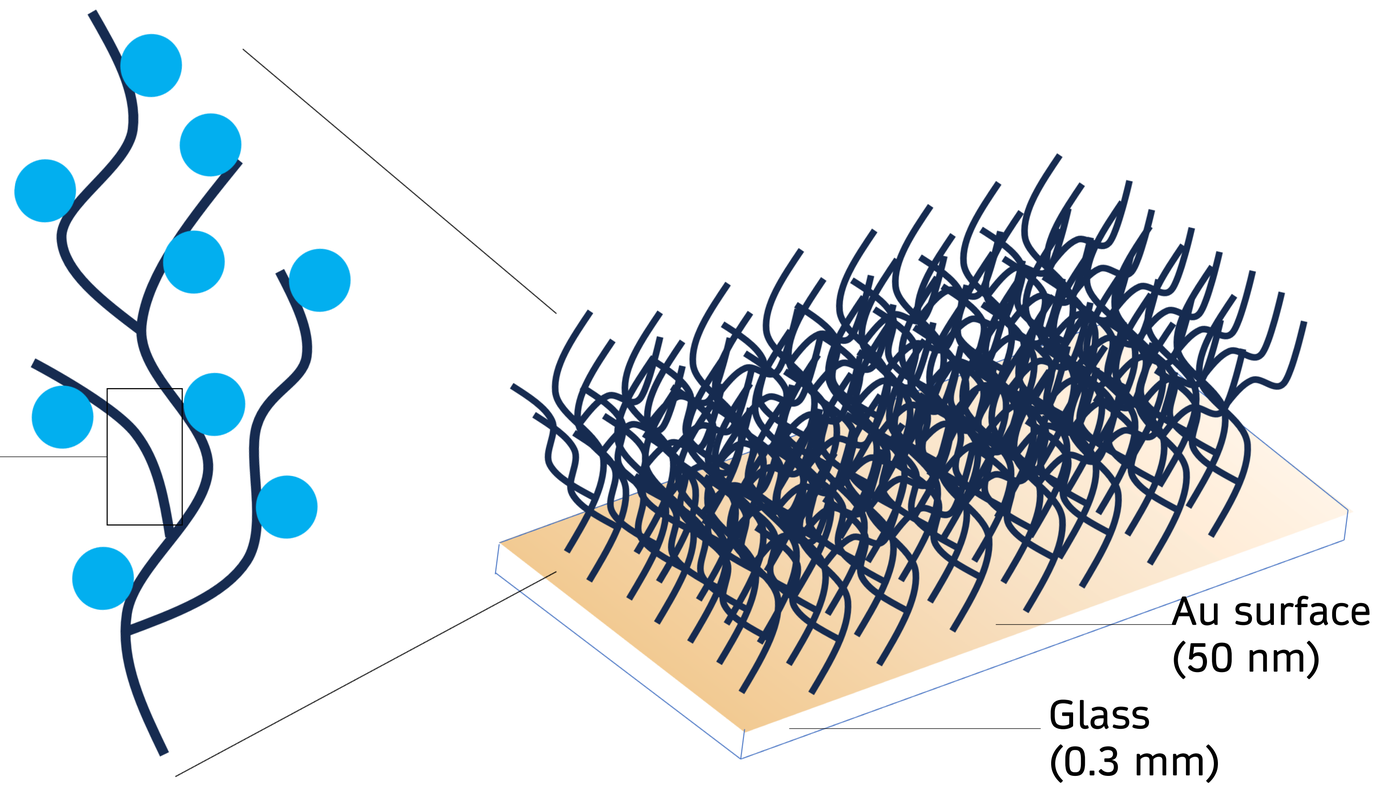
Dextran sensor chips were first commercially available in the early 1990s by applying solid surface technology well-optimized for affinity chromatography. Therefore, the largest amount of data has been accumulated using SPR to date. Therefore, there are many literatures and results that can be referenced, which is very advantageous for reproducing similar experiments. It is a universal sensor chip that can be used from large-sized proteins to small compounds.

Structure

Functional group:
COOH, Protein A/G



Backbone: Dextran



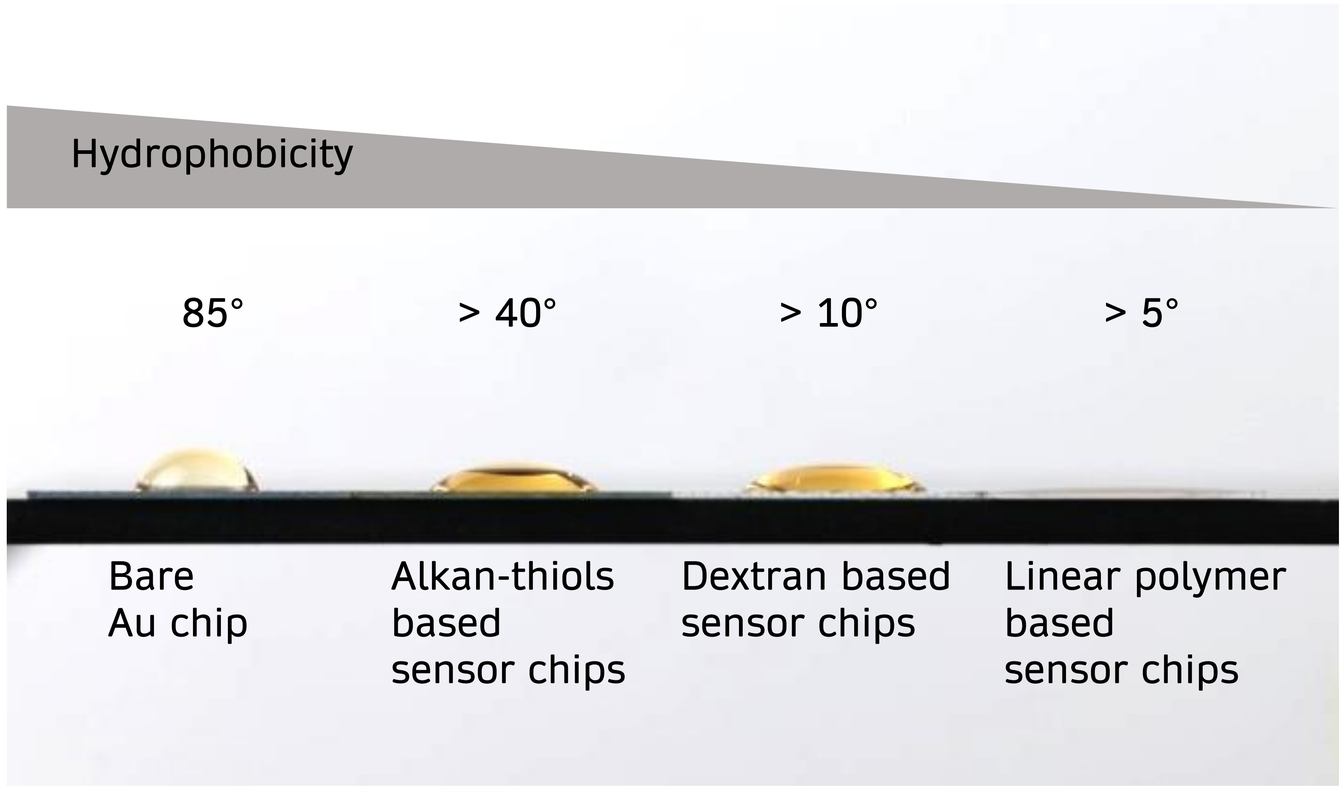
Immobilization level (Max.)

1000 ~ 20000 RU (molecule type and MW dependent)

Recommend analytes

1 kDa	10 kDa	100 kDa	10~500 nm
Small compounds	Oligomers Peptides	Small proteins	Macro sized proteins Antibodies	Vesicles Virus Nano particles

Contact angle of sensor chips



Various sensor chips made by icluebio have different degrees of hydrophobicity depending on the back-born material structure. Instead of using just one chip, improve the quality of your analysis with sensor chips of various surfaces.

Sensor chip storage kit

What's in the kit

Prism
holder

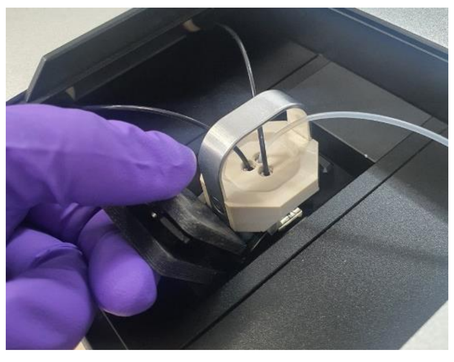
S-type storage
fluidic module

Storage
buffer

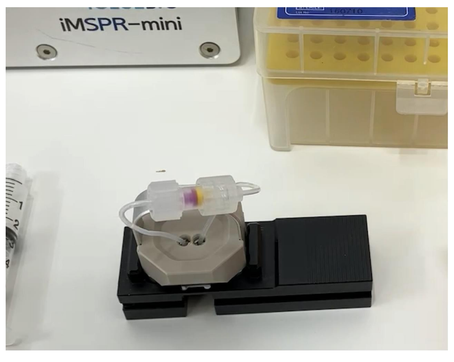
It is an essential tool to keep your sensor chip running. After removing the used prism holder from the device, install the s-type fluidic module. Then fill with storage buffer and store in the refrigerator. The ligand material immobilized on the sensor chip can be safely stored until the next use.

Steps

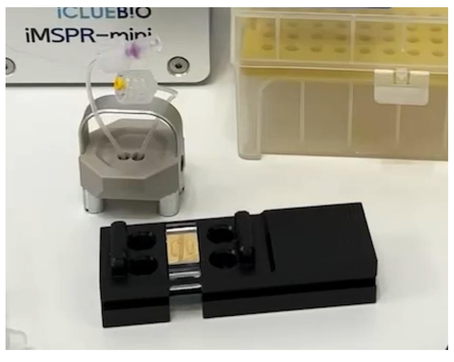
Detachment of U-type fluidic module and prism holder 1 after experiment



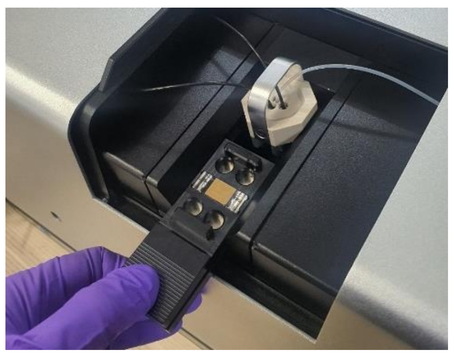
Assemble of S-type storage fluidic module and prism holder 1 and store at 2~8°C, you can perform another test using prism holder 2



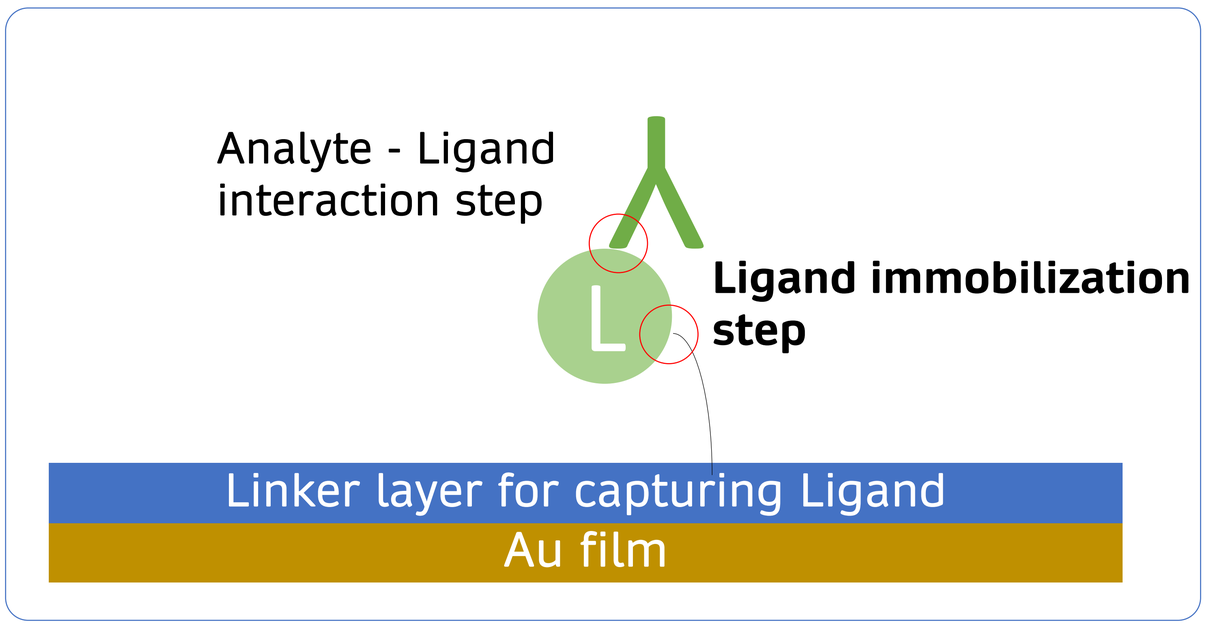
Detachment of S-type storage fluidic module and prism holder 1



Assemble of U-type fluidic module and prism holder 1 and do experiment

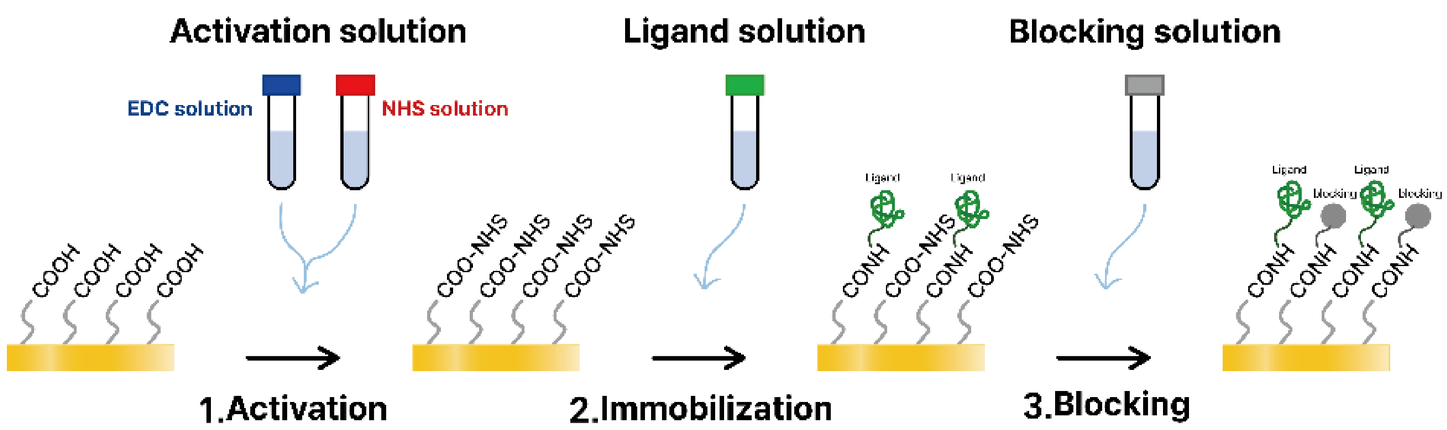


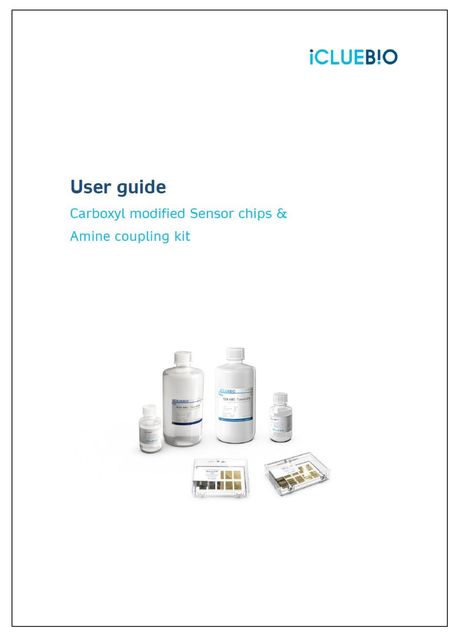
Reagents for immobilization



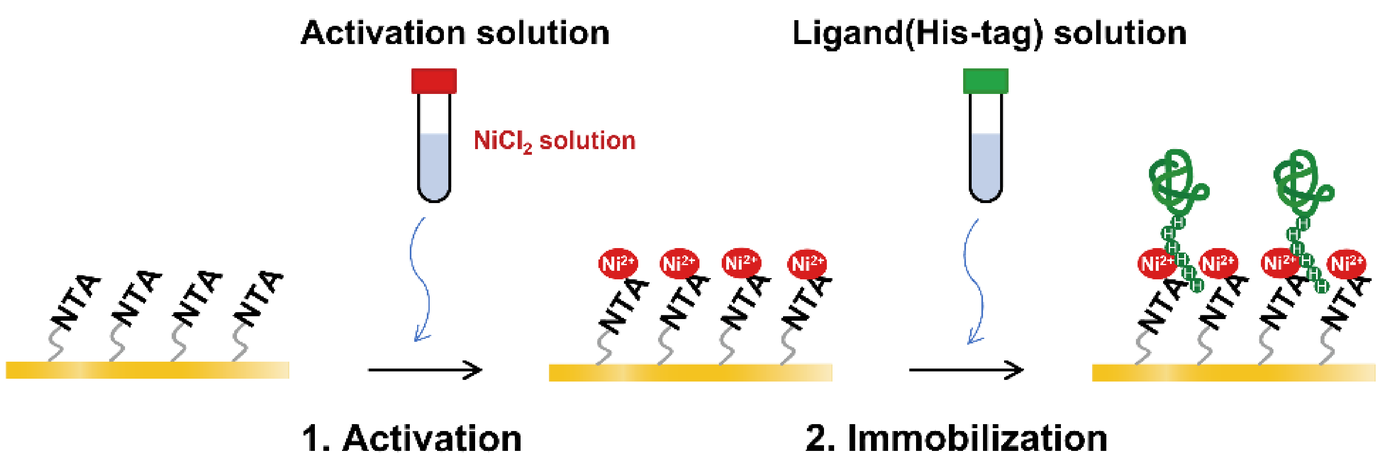
To analyze the binding between analyte and ligand, a ligand immobilization step must be performed on the sensor chip. Try immobilizing the ligand in various ways using the reagent kits provided by icluebio.

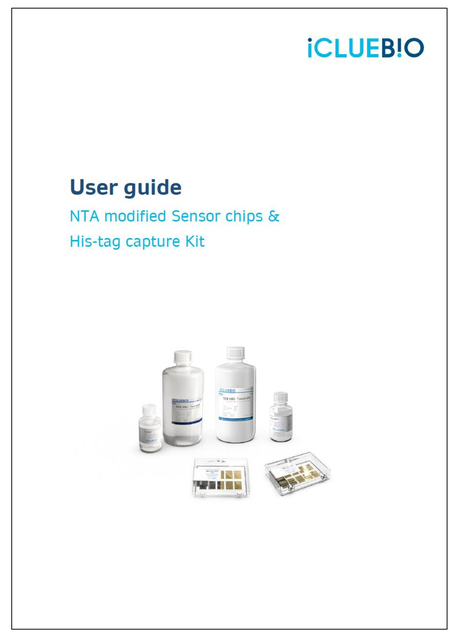
Amine coupling kit



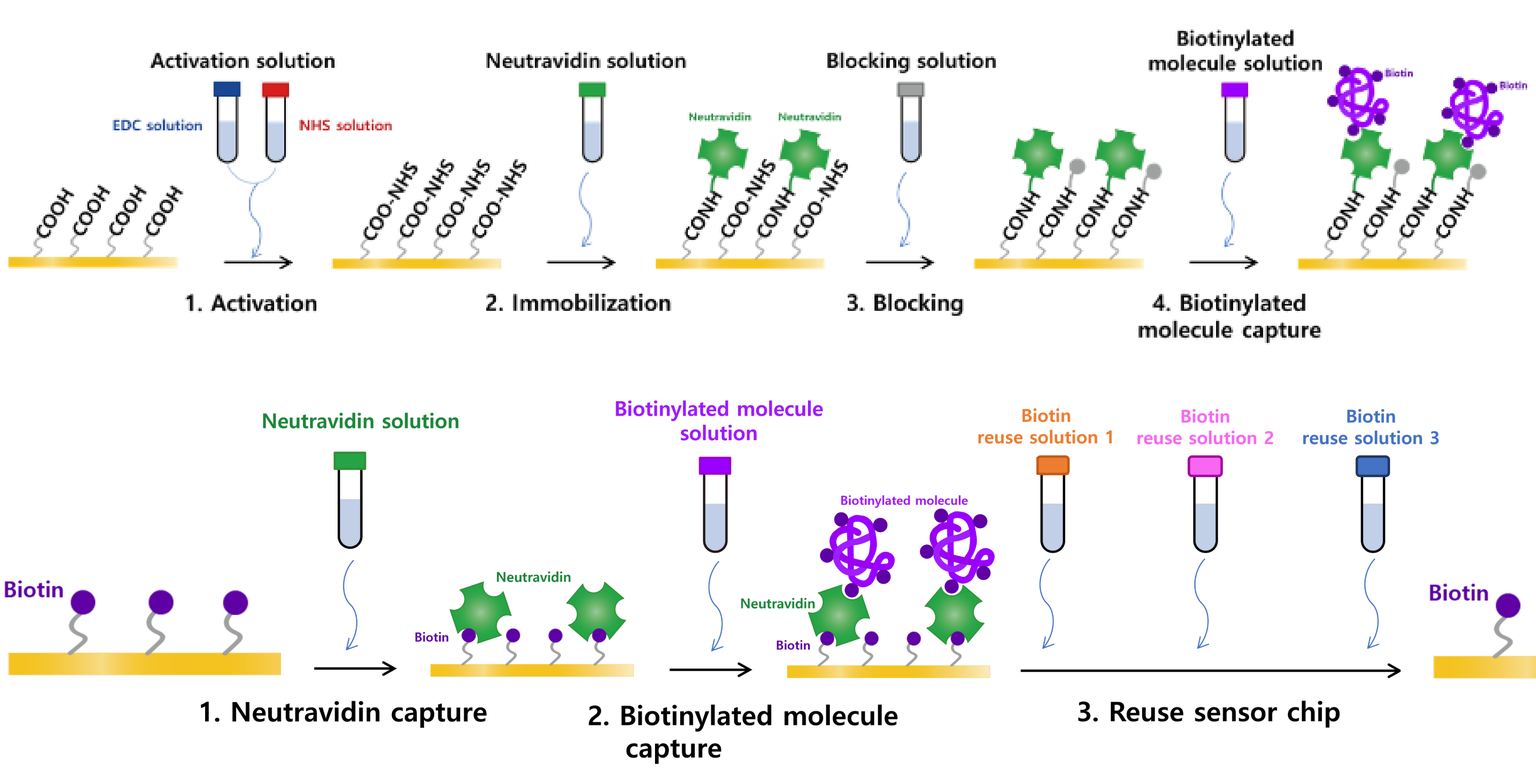


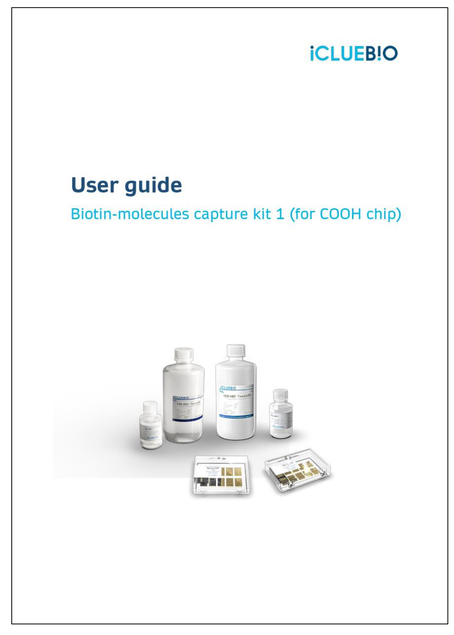
Histag capture kit





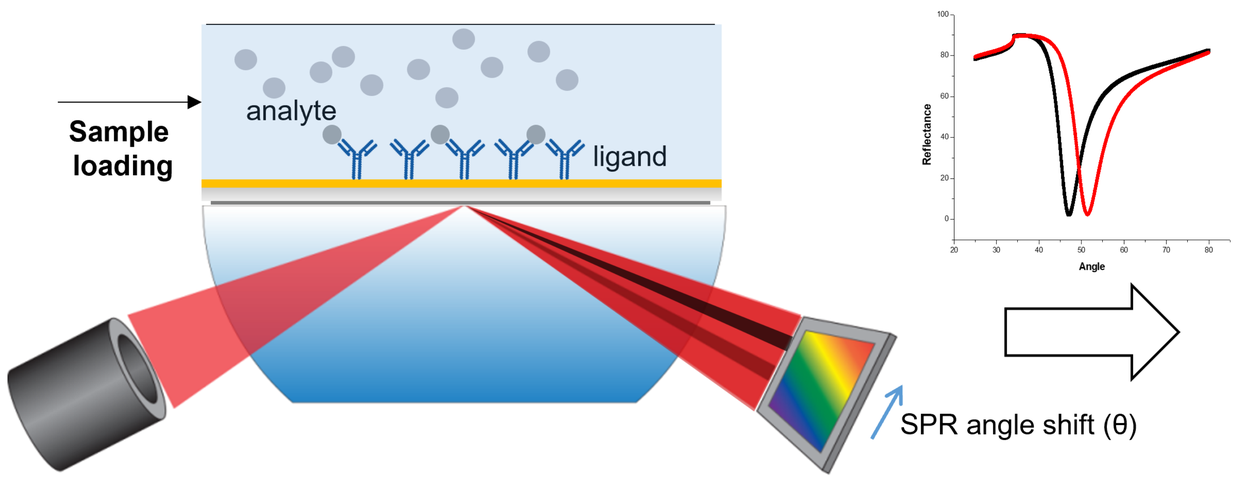
Biotin-molecule capture kit 1 & 2



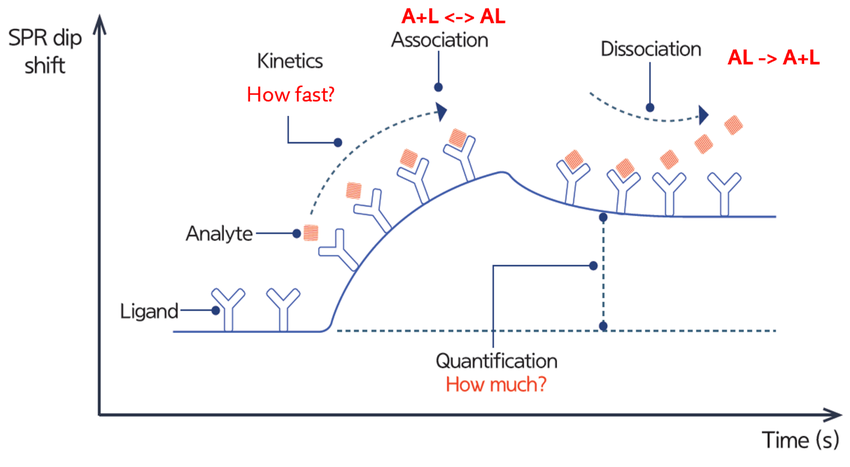


What is SPR

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 can monitor the 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 biomolecule bonding on the sensor chip.
3. The **sensorgram is acquired** by recording SPR angles in real-time
4. **Monitoring of intermolecular binding** through sensorgram

What are the uses of iMSPR

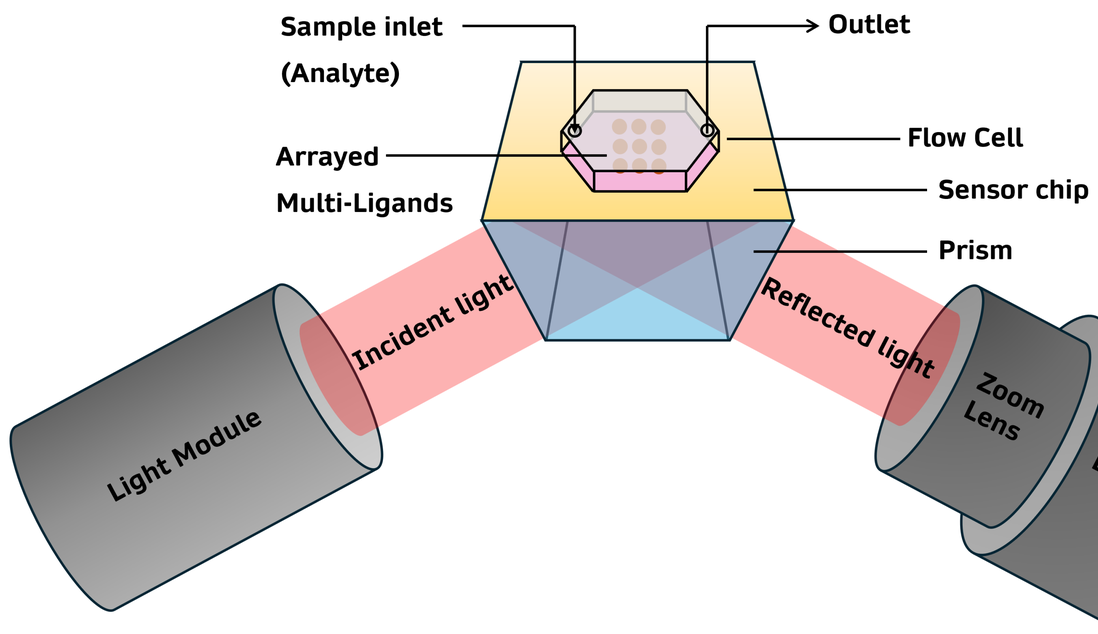
Biomolecular interaction analysis is not limited to proteins. The interactions between hybrid systems of DNA-DNA, DNA-protein, lipid-protein, small compound-protein and biomolecules and non-biological surfaces can be investigated.

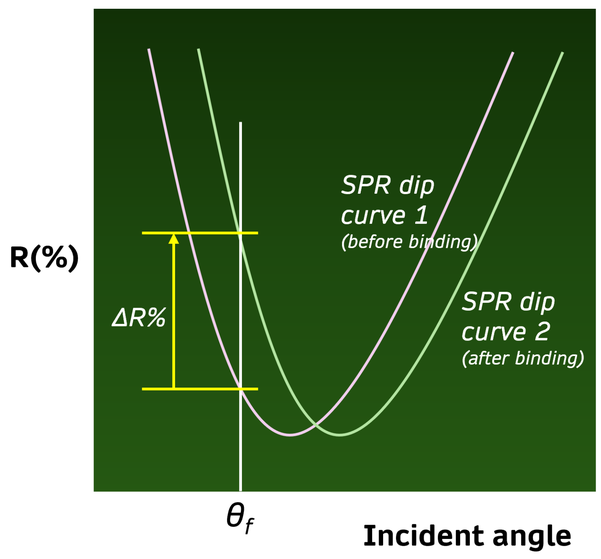
iMSPR is used

- To **identify the binding** of two or more interactants to each other
- To find (**screening**) candidates from lots of molecules
- To determine the **affinity (K_D)** of the interactions
- To evaluate the actual **association (k_a) and dissociation rates (k_d)**
- To **quantify the concentration** of analyte in sample solution
- To analysis **thermodynamics**: **H, S**

What is multi-array based SPR

Multi-array based surface plasmon resonance (MASPR) is a label-free optical detection technology used to monitor and analyze molecular interactions in real time. This SPR technology allows users to visualize the entire working area and analyze it in a multiplexed format, unlike the analysis of a small area of traditional angular interrogation SPR.





Analysis is performed by flowing a sample solution containing the analyte over a sensor chip where ligands are arrayed in the form of multiple spots. Under the sensor chip, light is incident and reflected at a specific angle in real time, and the reflected light is recorded in real time through a camera.

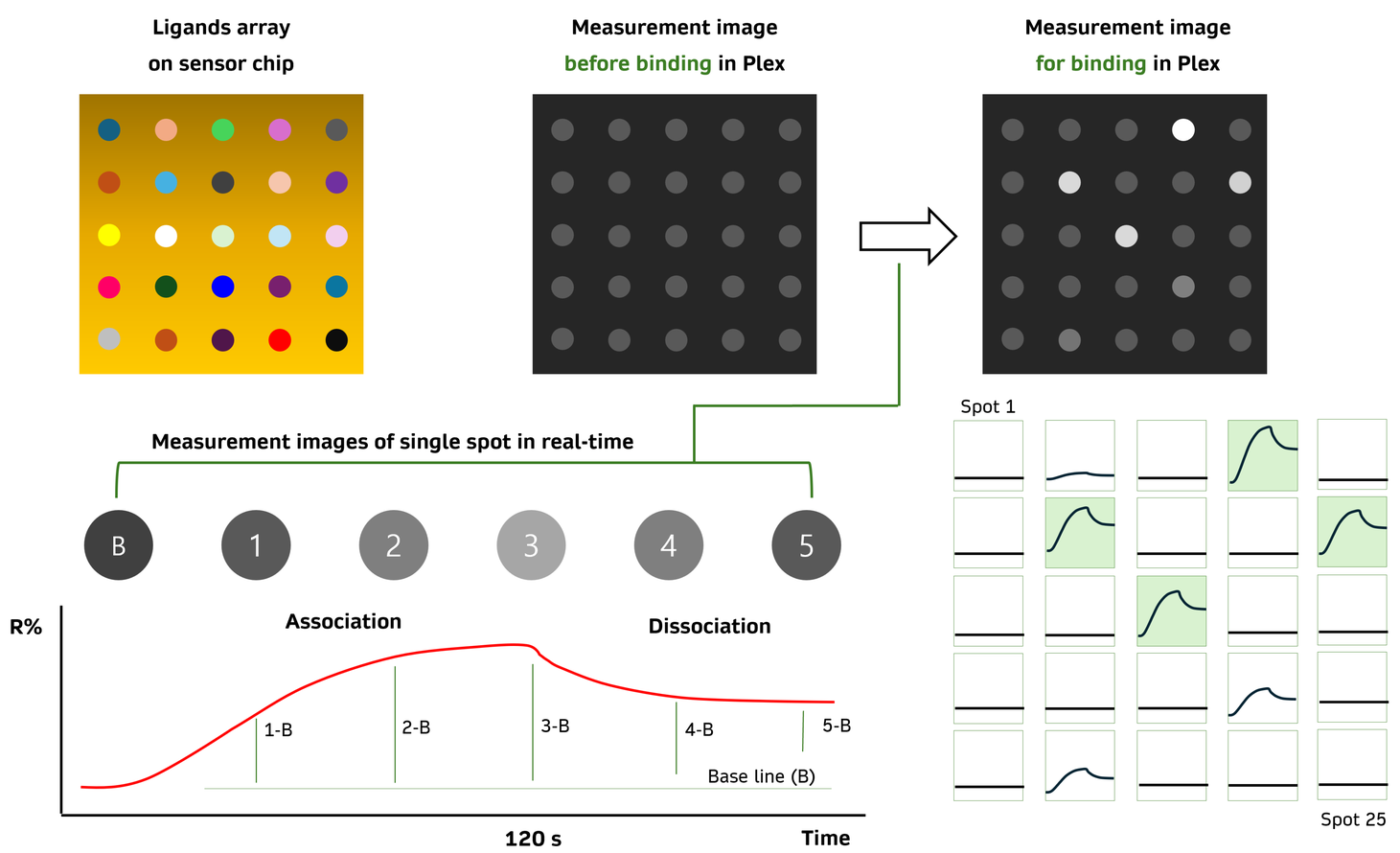
MASPR basically analyzes the image of the reflected light by incident light at a fixed angle. At this time, multiple analysis can be performed by utilizing the regional intensity difference of the reflected light (*ΔR%*). When molecules bind in a specific area, the intensity of the reflected light increases.

How can get multi-sensorgrams

1. Ligands array chip preparation: Array the ligands to be tested on a sensor chip using the iMSpot system.

2. Insert the ligands array chip into the iMSPR-PlexM device and start the measurement.

3. Flow running buffer before injecting the sample to establish equilibrium (section B).



4. After injecting the sample, measure the change in intensity of reflected light for each spot in real time. (Association section ①-③)

5. Flow running buffer after sample injection is complete. (Dissociation section ④-⑤)

6. If there are multiple samples, remove the previously bound material through the regeneration buffer and repeat steps 3-5.

Applications

Sample type	Compounds and fragments Peptides and small proteins DNA/RNA Proteins Antibodies Viruses Cells
Application	Yes/No binding Ranking, Screening Affinity (Equilibrium constants, K_D) Kinetics (Rate constants, k_a, k_d) Dissociation rate (residence time) Inhibition Quantification
Applicable fields	Life science Research Drug discovery Drug quality control Immuno-Oncology drug Small compounds Antibody therapeutics Antibody Drug conjugations (ADCs) Bispecific antibody Epitope mapping Immunogenicity Immunoassay based diagnostics

icluebio

icluebio was founded in Seoul, South Korea in 2017. Our mission is to create sustainable, well-balanced tools in terms of performance and cost that can impress customers and discover clues to life phenomena that can benefit mankind. Currently, we are devoting all our capabilities and passion to the Surface Plasmon Resonance-based analysis system, which enables simple, real-time observation of intermolecular bonds without labeling. We will do our best to be sustainable for products, people, company, and the earth.

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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.

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