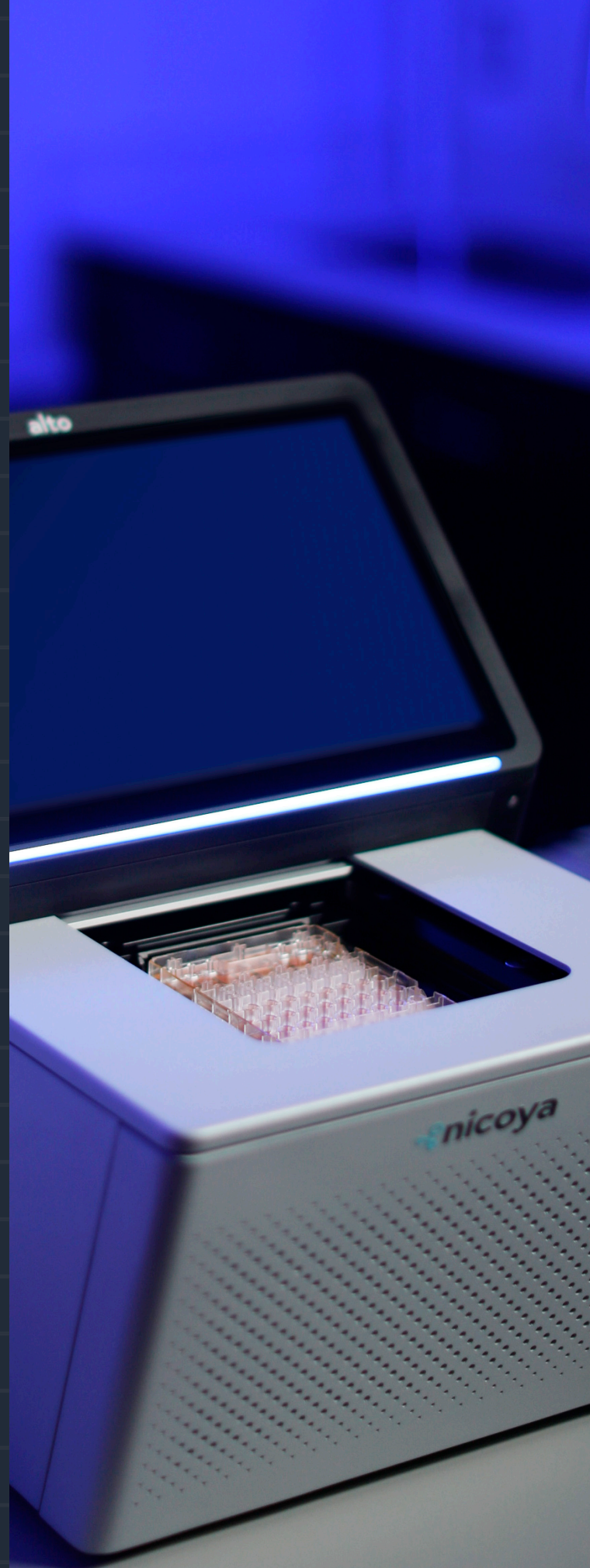


Alto

Simplify your
interaction
analysis with
Digital SPR

 nicoya



Make discoveries, not compromises

The world's first Digital SPR system: zero-maintenance, cartridge-based kinetics and affinity analysis using ultra-low sample volumes

Alto™ is the world's first Digital Surface Plasmon Resonance™ (SPR) instrument to integrate digital microfluidics (DMF) with nanotechnology-based biosensors. DMF is a new approach to SPR assays that dramatically increases the ease of use while providing high-throughput, high-quality binding affinity and interaction data.

The 16-channel Alto design enables:



Sample conservation

Save up to 200x the sample volume and obtain full binding kinetics curves from only 2 μ L



Reduced hands-on time

Spend 70% less time at the bench as the system automates all sample and buffer movements, including serial dilutions



Maximized data quality

The system can run analysis on a wide range of sample types, including crude media, serum, and complex matrices

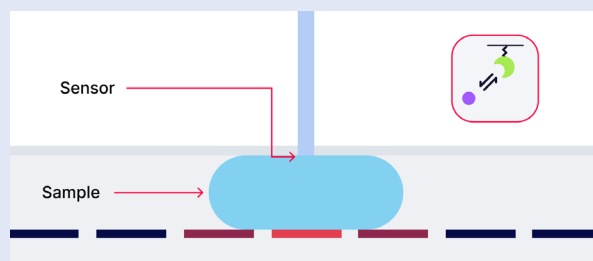


What is DMF?

DMF is a liquid-handling technology capable of accurately manipulating discrete nanoliter-sized droplets across an array of electrodes. Contained within the Alto Cartridge™, DMF delivers samples and buffers to the SPR sensor without the need for pumps, tubing, or flow cells typically used in traditional label-free systems, thereby eliminating the need for maintenance.

In addition to significantly increasing ease of use, DMF-cartridge design also overcomes traditional SPR limitations by:

- Removing human error in sample dilutions to enhance quantitative accuracy
- Decoupling flow rate and sensor position from dispersion to improve data quality



Voltage moves drops across the cartridge in discrete, programmable pathways to deliver, modify, and remove reactants at the sensor surface.

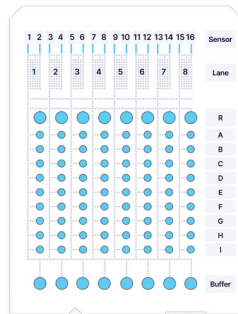
Beyond traditional SPR

Empower your team with the most user-friendly platform designed for biologics R&D.



Compact hardware

Benchtop instrument free of fluidic components and easily upgradeable.



Disposable cartridge

Sensors, fluidics and reagents are all integrated in one consumable powered by digital microfluidics.



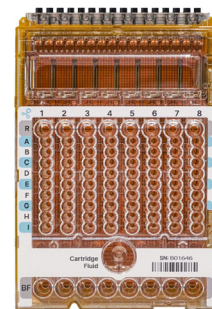
Intuitive software

Designed for any skill levels, with local or cloud access to your data anytime.

Run with confidence

Alto's plug-and-play design makes it easy for anyone in your lab to confidently operate SPR. Pre-designed experiment templates are readily accessible through a touch-screen interface, and flexible cartridge designs allow you to run hundreds of interactions in a variety of formats.

The single-use cartridges contain all samples and buffers needed to assay up to 48 samples. Serial dilutions of each sample are performed on-board, enabling up to 240 total interactions per cartridge — all without user intervention. Once the assay is complete, cleanup is as simple as removing the cartridge.



Alto's 16-channel cartridge.

After some searching, we identified the Nicoya Alto as the **obvious choice** to meet those needs due to its low cost and maintenance, small footprint, flexibility, and extremely small required sample volumes. **We couldn't be happier with the decision...** Within a month of Alto's arrival, we had developed **publication-quality** data for our upcoming manuscript.



Matthew Woodruff, Ph.D.
Assistant Professor, Dept. of Medicine

Elevate your SPR setup and analysis

Take the guesswork out of SPR with Alto's intuitive analysis software: the Nicosystem

A first of its kind, the Nicosystem™ provides a one-stop centralized hub for managing and analyzing experimental runs, all while offering you the flexibility of accessing your data on the cloud or locally.

Discover different Nicosystem options that match your research needs and budget today.

Nicosystem Essentials

Ideal for basic research

- ☑ Kinetics / affinity

Most popular

Nicosystem Pro

Ideal for biologics discovery

- ☑ Kinetics / affinity
- ☑ Quantitation
- ☑ Screening
- ☑ Epitope mapping / binning



Design on the go

Map your sample layout, set up your assay, and build your experiment all without needing to be at the bench. Any experiment designed on the Nicosystem will be immediately available to run on your instrument once you're back in the lab. And with Alto's application-centric design modules, you will always be in control of when and how your team runs experiments.

One-click analysis

Eliminate lengthy post-processing with Nicosystem's one-click analysis. A diverse range of models and investigative tools are available to accurately interpret your data and provide high-quality insights. With Nicosystem's seamless end-to-end handling of your experiments, you'll be empowered to scale your workflow and quickly share new discoveries.

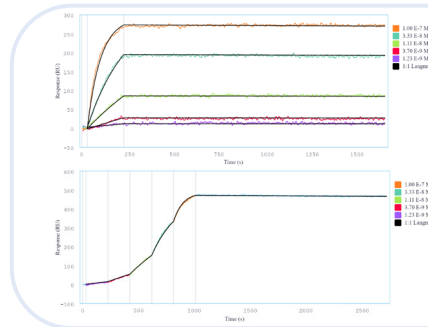
Built for biologics

Investigate a wide range of applications with a platform built to handle the unique complexities and constraints of biologics.

Characterize affinity/kinetics

Simultaneously analyze multiple targets in different assay formats while reducing hands-on time with complete assay automation.

- Screen a wide range of affinities.
- Predict drug potency with kinetics.
- Determine specificity & selectivity.
- Reduce hands-on time by up to 70%.
- Leverage flexible assay design.



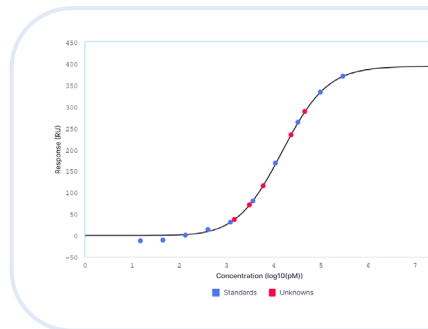
Kinetic formats

Multi-cycle and single-cycle kinetics of influenza A protein binding to immobilized influenza A antibodies.

Quantify samples

Determine active sample concentrations with high-throughput quantitation.

- Determine up to 40 unknown concentrations.
- Automate sample dilutions.
- Generate up to 8 standard curves and calibrate with 5PL curve fitting.



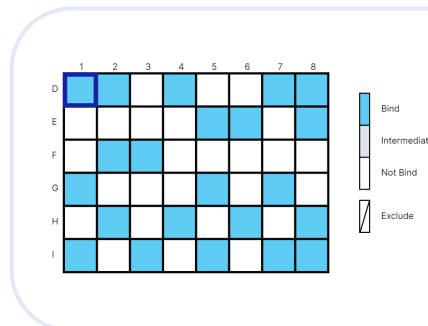
mAb quantitation

Monoclonal antibodies in serum specific to the H3N2 hemagglutinin protein were quantified at varying concentrations, generating a calibration curve with 10 different known standards.

Screen complex media

Quickly determine binding activity and select the most relevant hits with Alto's rapid screening protocol.

- Process up to 96 interactions in one run using microliters of samples.
- Screen directly from crude samples via direct or capture method.
- Analyze data with sorting and exclusion features.
- Use minimal sample volumes (2-5 µL).



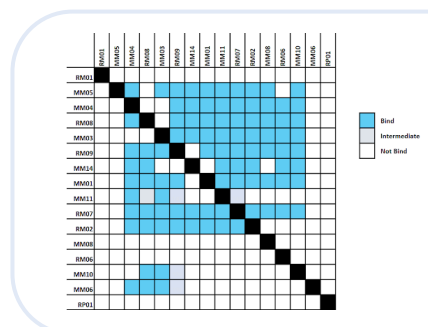
Blind Ab screening

Heat map generated from antibody screen against H3N2 hemagglutinin (ligand) illustrating which samples contained anti-H3N2 HA Abs (analyte) in direct screening.

Evaluate epitope diversity

Alto's robust epitope software simplifies competition assays to identify unique binders, and creates exportable visualizations for easy interpretation.

- Rapidly bin up to 16x16 mAbs.
- Process 256 interactions in <16 hours.
- Analyze data comprehensively with automatic data normalization.



Influenza A antibodies

Antibodies binding to influenza A nucleoprotein were characterized with a classic sandwich assay. "Bind" indicated a unique epitope targeted by the antibodies in a 16x16 epitope bin.

Alto GxP Suite

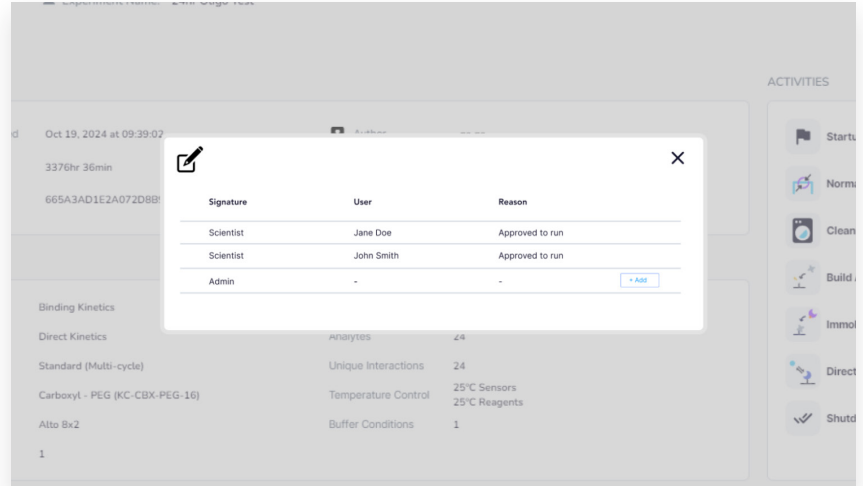


Streamline development, enhance compliance

Characterization of biomolecular interactions is an essential part of analytical development and biomanufacturing. Now with the Alto GxP Suite™ consisting of software expansions and services, the Alto can better support characterization needs while meeting compliance requirements in regulated labs, including the FDA's 21 CFR Part 11 guidelines.

Key offerings

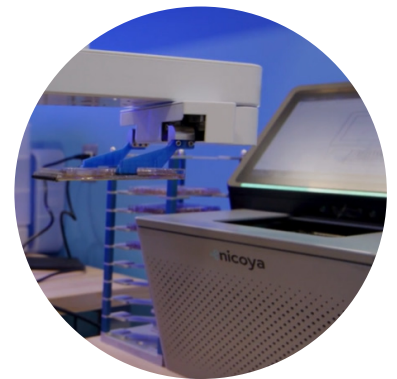
- **Software expansion:** Built with critical features such as user access controls, secure data storage with edit-protected format, electronic signatures, and comprehensive audit trails
- **Qualification kit:** Contains all required instructions and documentation required for users to perform IQ, OQ and PQ on their own.
- **Qualification service:** A trained Nicoya representative will travel to your site and perform IQ (if required due to instrument relocation), preventive maintenance and OQ.



Example of E-signatures being applied to analysis.

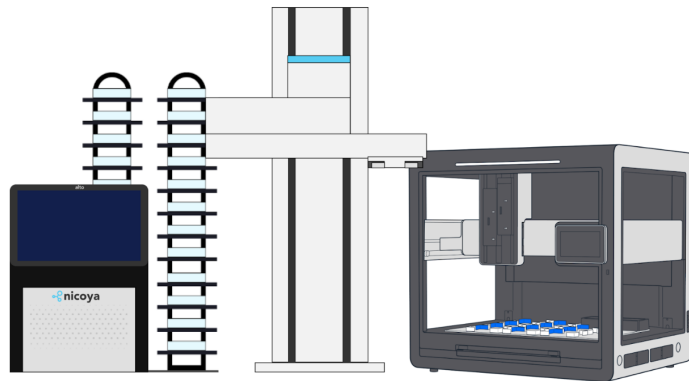
Alto Automation Suite

The Alto Automation Suite™ enables scientists to program tasks directly within Alto while seamlessly integrating into existing automated workflows, ELN/LIMS systems, and data pipelines. This makes Alto the world's first SPR platform fully compatible with standard lab automation, supporting analysis of thousands of samples per week — entirely hands-free.



Key offerings

- **Automation API:** The API allows for rapid integration of Alto with automation hardware, LIMS, scheduling, and data management software.
- **Automated workcell:** Get the Alto together with the Opentrons Flex® liquid handling robot. Custom labware definitions, developed in collaboration with Opentrons, are included for seamless integration.



At a glance

Specifications

Fluidics

Channels	16
Fluidics Technology	Digital microfluidics

Sample Handling

Sample Capacity	Up to 48 (240 interactions)
Sample Volume	2 μ L per well
Referencing	1:1
Automation	Automated dilutions (3x) Robotics compatible API included
Unattended Run Time	24+ h
Crude Sample	Yes
Fluidic Maintenance	None

Performance

Association Range	Up to 10^9 1/M*s
Dissociation Range	10^{-6} - 1.0 1/s
Affinity Range	pM - mM

General

Assay Types	Kinetics & Affinity Quantitation* Screening* Epitope Mapping/Binning*
Temperature Control	Analysis: 25 °C, 37 °C Sample storage: Chilled
Connectivity Mode	Cloud, Local
Weight	23.1 kg
Sample rates	1 - 10 Hz
Dimensions	43H x 35W x 52D cm
GxP Compatibility	Available

* Available only in Nicosystem Pro Software package

Applications

- Kinetics/affinity characterization
- Quantitation*
- Screening*
- Epitope mapping/binning*

Compatible with

- Proteins/peptides
- Antibodies
- Nucleic acids
- Crude samples
- Viruses
- Small molecules
(application dependent)

Surface chemistries

- Carboxyl
- Streptavidin (kit)
- Protein A (kit)
- Anti-His (kit)
- Human/rabbit IgG VHH (kit)





Join us on our mission to
improve human life



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