

Introducing the Beacon Discovery™ Optofluidic System

Key Highlights

- **Accessible** – Lower cost of ownership, reduced running costs, and intuitive interface - for easy adoption
- **Compact** – Benchtop size maximizes lab space without sacrificing functionality
- **Flexible** – Deliver end-to-end workflows for immune profiling, antibody discovery, and custom functional assays
- **Proven** – Built on widely published and validated optofluidic platform

Live Single Cells. Deepest Functional Insights.

Experience the full potential of live single cell functional analysis with Beacon Discovery. Powered by optofluidic technology, it enables researchers to explore multimodal and temporal cellular responses in real time, seamlessly linking functional data to sequencing from the same single cell for deeper scientific breakthroughs. This compact, accessible, and flexible platform delivers unparalleled insights into immune profiling, cell therapy, and antibody discovery.

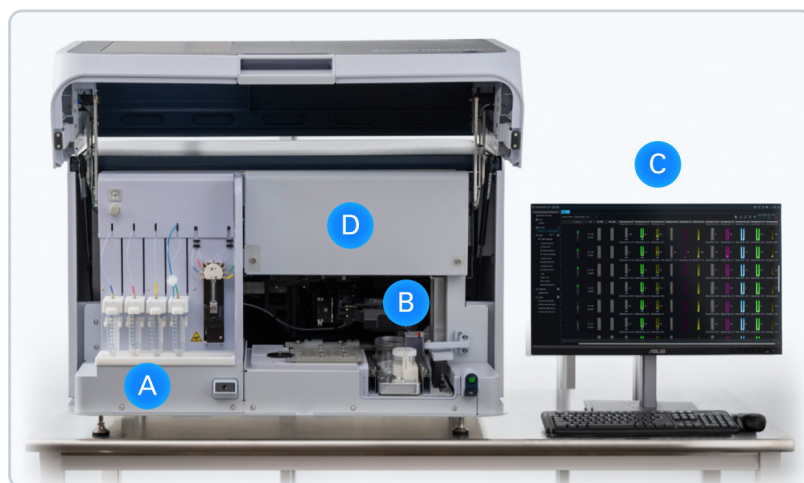


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Instrument Features

- Compact, benchtop instrument
- Throughput: 1 chip, up to 20,000 single cells per run
- Four fluorescent channels (exchangeable cubes)
- 4x bright field magnification
- Intuitive, customizable software
- Compatible with all OptoSelect® chips



How It Works

Streamlined Workflow for Rapid Discoveries

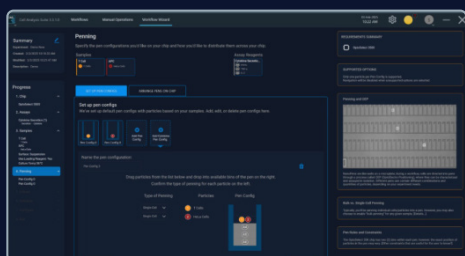
At the core of Beacon Discovery is the **OptoSelect chip**, which uses **nanofluidics** and **Opto-Electrical Positioning (OEP®)** technology. The system integrates customizable Bruker Cellular Analysis reagents and OptoSelect chips to deliver seamless user experience.

- 1 Load Reagents & Samples** – Place reagents in the reagent bay (A) and load OptoSelect chips into the sample bay (B).
- 2 Guided Workflow Setup** – The Workflow Wizard (C) walks you through experiment setup and execution.
- 3 Exquisite Control on Single-Cell Experiments** – OEP technology gently moves and positions live single cells and reagent beads in NanoPen® chambers, delivering high-precision functional characterization.
- 4 Multi-Modal and Temporal Analysis with Live Single-Cell Imaging** – The OptoSelect chip and horizontal NanoPen design enables continuous perfusion and rapid reagent exchange—keeping cells alive for days or weeks. Run multiple assays on the same cells across time points. Four exchangeable fluorescent channels (D) enable real-time brightfield and fluorescence imaging with minimal hands-on time.
- 5 Data Capture & Sequencing Integration** – Identify and recover high-value cells, then link functional insights to transcriptomic and genomic sequencing for deeper analysis.

CAS
4.0

Workflow Wizard & Advanced Data Analysis

The **Cellular Analysis Suite (CAS® 4.0)** is an advanced software that enables researchers to customize and automate single-cell workflows and analyze multi-parameter functional data in real time. It visualizes and extract meaningful insights while adapting it to specific needs such as antibody discovery, T cell profiling, or adoptive cell therapy research.



Workflow Wizard



Data Analysis Suite

Compatible Assays and Applications

- Identify functional immune cell subsets in **T cell profiling** and **cell therapy research**
- Discover novel antibody candidates with **high-throughput single B cell screening**
- Develop **custom live single-cell functional assays** for novel applications

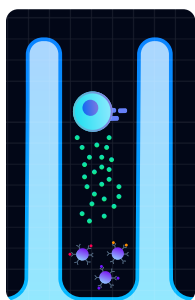


T Cell Profiling & Cell Therapy Research

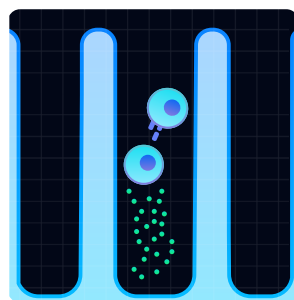
Beacon Discovery delivers comprehensive T-cell profiling workflow for functional characterization and T-cell therapy discovery, validation and translational research.

Key Functional Assays:

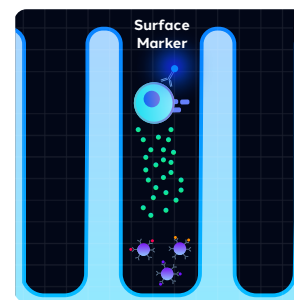
- ✓ **Multiplexed cytokine secretion** – Detect multiple cytokines **simultaneously**



- ✓ **Dynamic cytotoxicity** – Measure real-time killing capacity of T cells



- ✓ **Surface marker phenotype** – Characterize immune cell subsets



Why it Matters | By linking **phenotypic and functional data to genotypic insights**, researchers can accelerate **immune therapeutic development** with greater precision.

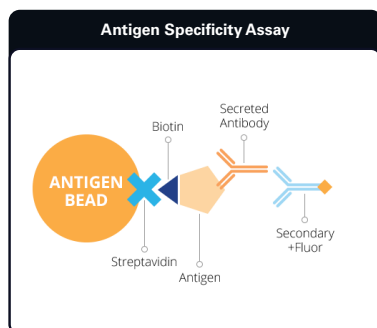


Antibody Discovery & Functional Screening

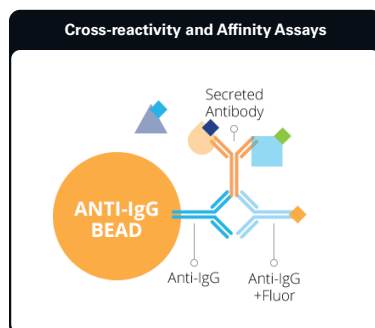
Beacon Discovery enables multi-species high-throughput single B cell screening, maximizing the success of antibody campaigns.

Key Functional Assays:

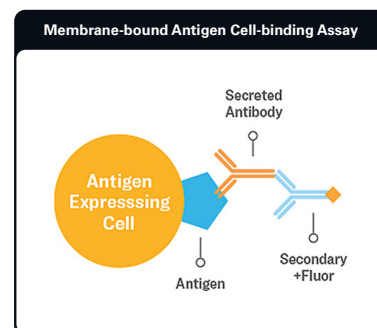
- ✓ **Antigen specificity** – Identify target-reactive antibodies



- ✓ **Cross-reactivity & affinity** – Assess binding strength and selectivity



- ✓ **Ligand-blocking & membrane-bound antigen detection** – Validate functional activity



Why it Matters | By **enabling multi-parameter data collection from the same live cells**, Beacon Discovery ensures **lead candidate selection** and **reduces discovery timelines**.

Beacon Discovery™ Specifications

CAPABILITIES

Applications	- T Cell Profiling - Antibody Discovery - Other R&D Workflows
Assays	- Secreted / Extracellular Products - Intracellular / Cell Surface Fluorescence - Proliferation - Morphology - Motility - Cell-Cell Interaction - Multiplexed Cytokine Assays - Cytotoxicity Assays - Antigen Specificity - Quantitative Secretion Assay - Multiplexed Fluorescent Assays - Lead Selection Assays - Custom Assay Development - Ligand Blocking
Cell Types	T cells, plasma cells, memory B cells, hybridoma cells, primary cells, adherent cells, CHO, HEK, others

FEATURES

Features	- One optofluidic chip capacity; supports a variety of OptoSelect® chip types - Automated sample import/export - System-driven, on-board culturing, imaging, assay, and OEP® capabilities - Four color channels plus brightfield imaging for assay development - Patented Bruker Software Suite that provides automation and analysis software tools, including Cell Analysis Suite (CAS®), Image Analyzer, and Assay Analyzer - Objective: 4X - High-resolution camera
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ATTRIBUTES

Dimensions	- Width: 40.5 in (103 cm) <i>Recommend 6 ft (180 cm) for instrument and monitor</i> - Depth: 31 in (79 cm) - Height: 26 in (66 cm) – door closed - Height: 38 in (97 cm) – door open
Weight	- Free-standing: ~300 lb (~140 kg) - Crated for shipment: ~500 lb (~230 kg)

INPUTS

Power	Dedicated 110 – 240 V, 50 – 60 Hz, 20A circuit
Gas Supply	>5% CO₂: 20 – 120 psi, 6 mm push-to-connect fitting* <i>*Other NPT compatible fitting options available</i>
Recommended Clearance	- Front: 24 in (60 cm) - Rear: 6 in (15 cm) - Left/Right Sides: 24 in (60 cm) - Above: 36 in (92 cm)
Other Connections	Ethernet, USB, coolant (for optional chiller mode for import/export well plate)
Working Environment	- Temperature: 64 – 79°F (18 – 26°C) - Humidity: 20 – 60% - Altitude: <6,500 ft (2,000 m)
Laser Safety	Class 1 laser product

SPECIFICATIONS

Import	Recommended input density: 1e5 - 1e7 cells/mL (application dependent) Formats: - Standard height (up to 16 mm) 96-well microtiter plates
Fluorescence Capabilities	- Brightfield - Up to 4 colors
Culture	- Customer-defined media - Per-chip temperature control: 18° C to 40° C

COMPATIBLE OPTOSELECT® CHIPS

Chips	OptoSelect® 1750b chips
	OptoSelect® 3500 chips
	OptoSelect® 11k chips
	OptoSelect® 20k chips

Get Started with Beacon Discovery Today!

For more information about how the Beacon Discovery can advance your research, visit <https://brukercellularanalysis.com/products/instruments/beacon-discovery-optofluidic-system/>



Talk to an Expert to see how Beacon Discovery can elevate your research!



Explore our Product Literature and Resource Library



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