Find the **best** cells

Beacon Quest™

Optofluidic System

for **Academic Research**

BROCHURE

REV B | SEPTEMBER 2023

BRUKER

Microfluidics meets microscopy and flow cytometry

Cutting-edge optofluidic platform designed for academic, non-profit and government research

FEATURES AND BENEFITS

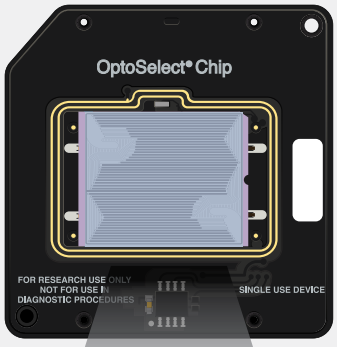
- Patterned light is used to sort individual cells into NanoPen® chambers with volumes ranging from 0.25 nL to 1.7 nL
- High-throughput miniaturized assays are run in parallel to identify phenotypes of interest
- Single cells with phenotypes of interest can then be recovered for downstream processes
- Designed to accelerate the pace of academic discovery

Assay thousands of cells simultaneously

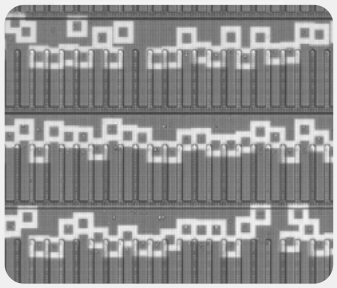
Simultaneous incubation and screening of thousands of single cells on a chip

Process and analyze cells in a **faster, more insightful way**

The core of the system is the OptoSelect® chip, which combines nanofluidics and opto-electropositioning technology.



OptoSelect® chips use light to automatically move individual cells.



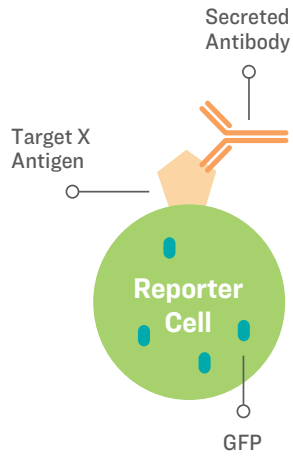
Cells are assayed in individual 0.25 – 1.7 nL **NanoPen®** chambers.

Assays performed quickly with as little as a single cell

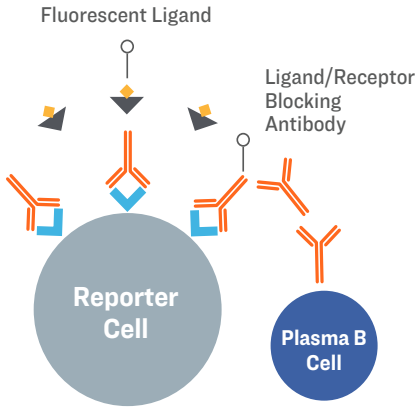
NanoPen chambers are 100,000 times smaller in volume than a microwell. Isolate and assay a single cell within minutes. You won't need to wait weeks for a larger quantity of cells. You have complete flexibility to run fully-automated assays, sequentially or simultaneously to unlock new discoveries and insights on a single platform.

Assay types:

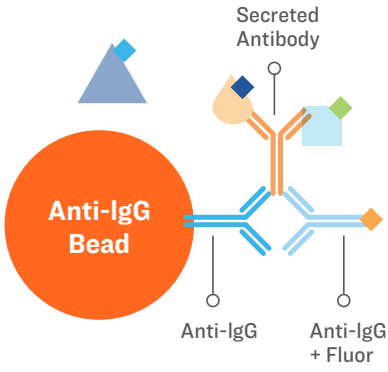
- IgG secretion
- Multiple antigen screening
- Cross-reactivity
- Growth rate
- Surface markers
- Reporter gene assays
- Ligand-blocking assay
- Cell/cell interaction
- Multiplexed cytokine assays
- Cytotoxicity assays
- Bead-based assays
- Bulk fluorescence assays
- Link phenotype to genotype
- Other functional assays



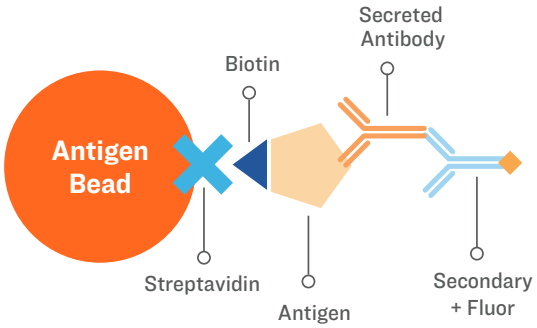
Functional Assay



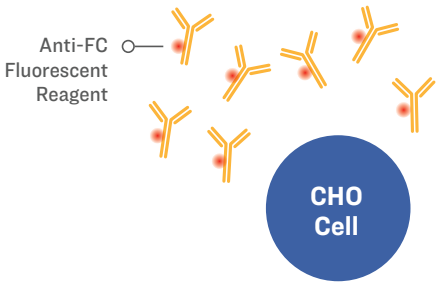
Ligand-blocking Assay



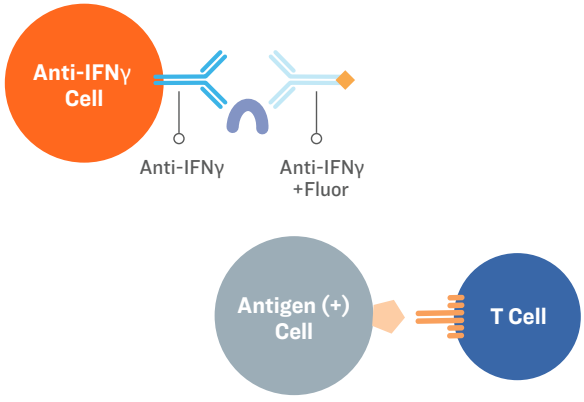
Cross-reactivity Assay



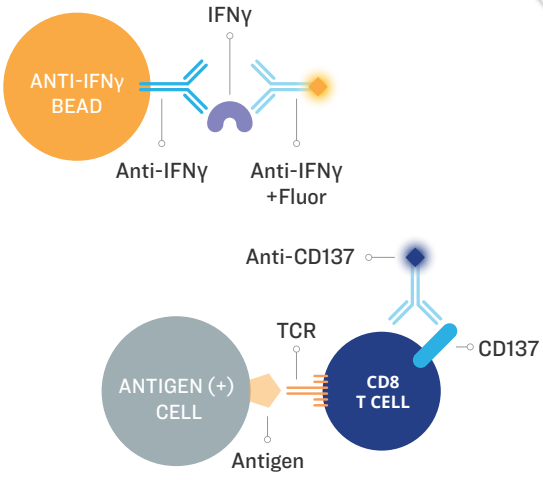
Antigen-binding Assay



Bulk Fluorescence Assay



Cytokine Secretion Assay



Cytotoxicity Assay

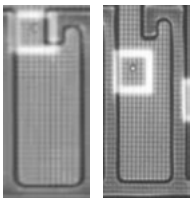
Screen the right cells automatically and precisely

4 simple steps to your **best** cells

1

Sort

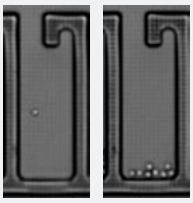
Our software automatically detects individual cells and then uses patterned light to isolate single cells into NanoPen chambers.



2

Culture

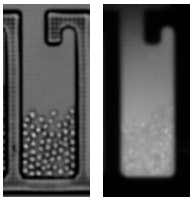
As cells expand fresh media is perfused across the chip, nutrients diffuse in and waste diffuses out while the software images the NanoPen chambers continuously – enabling cell counting, growth rate calculations, or other morphological characterization.



3

Assay

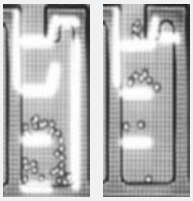
Run thousands of assays in parallel using our NanoPen chambers that are 100,000 times smaller in volume than a microwell in a 96 well plate – enabling phenotypic characterization of individual or populations of cells.



4

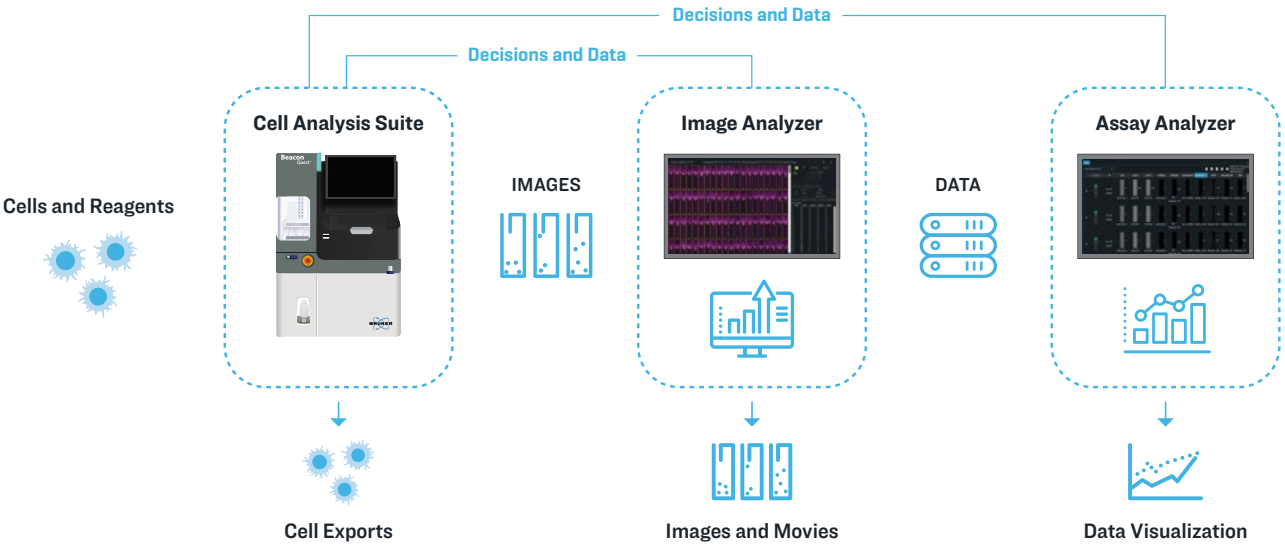
Recover

Selectively recover your best cells with phenotypes of interest from NanoPen chambers for downstream processing including sequencing or live cell recovery.



Dive deeper into the data with powerful software

Data analysis with **Cell Analysis Software (CAS®) suite**



Cell Analysis Suite (CAS®)

Runs all assay operations, from importing samples to exporting live cells of interest. Easy drag and drop workflow builder for flexible assay setup.

Assay Analyzer (AA)

Filter, sort and visualize individual pens to review the history of each clone throughout your workflows and downselect cells or NanoPen chambers of interest. Compile your images and data into a PDF report with your new findings.

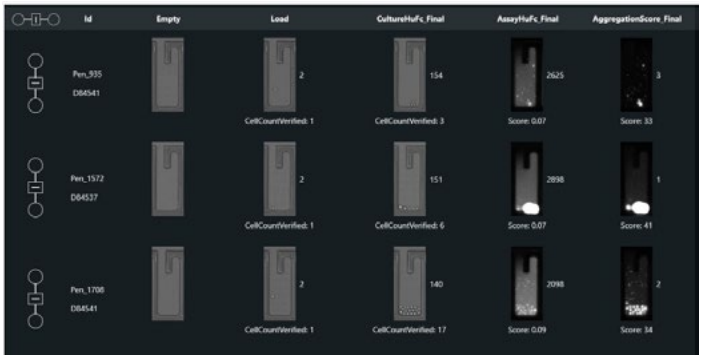
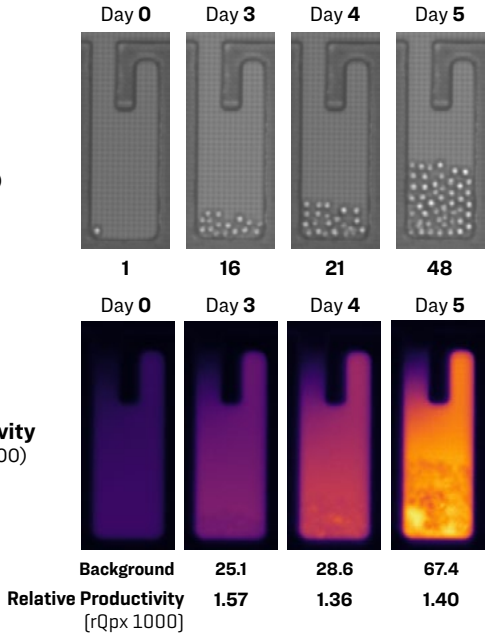


Image Analyzer (IA)

Score assays, count cells, consolidate images, view and process time lapse images, and perform pseudo coloring with this image visualization application.

- Automated imaging to verify monoclonality
- Cell counting to monitor growth
- Analyze bead-based and bulk fluorescent assays
- Visually track every step throughout your workflow



BEACON SPECIFICATIONS:

CAPABILITIES

Applications	• Antibody Discovery • T Cell Profiling • TCR Sequencing • RNAseq with OptoSeq® 3′ mRNA • Cell Line Development • Other R&D workflows
Assays	• Antigen Specificity • Quantitative Secretion Assay • Multiplexed Fluorescent Assays • Lead Selection Assays • Custom Assay Development
Cell types	CHO, plasma B cells, memory B cells, T cells, hybridoma cells, primary cells, adherent cells, others

FEATURES

Features	• Two optofluidic chip capacity; supports a variety of OptoSelect® chip types • Automated sample import/export • System-driven, on-board culturing, imaging, assay, and OEP™ capabilities • Five color channels plus brightfield imaging for assay development • Patented Bruker Software Suite that provide automation and analysis software tools, Cell Analysis Suite (CAS®), Image Analyzer, and Assay Analyzer

SPECIFICATIONS

Import	• **Recommended input density:** 1e5 – 7e6 cells/mL • Formats: 1.5 mL Eppendorf tubes, 0.2 mL PCR tubes • Std. height (up to 16 mm) 96-well microtiter plates
Fluorescence capabilities	• Brightfield • Up to 5 colors • Standard configuration: – **DAPI:** Ex: 370 – 410 nm / Em: 429 – 475 nm – **FITC:** Ex 450 – 500 nm / Em: 515 – 565 nm – **PE:** Ex 540 – 557 nm / Em: 576 – 596 nm – **TxRed:** Ex: 542 – 582 nm / Em: 604 – 644 nm – **Cy5:** Ex: 608 – 648 nm / Em: 672 – 712 nm
Culture	• Customer defined media • Per chip temperature control: 10°C to 40°C

INPUTS

Power	Dedicated 110 – 240 V AC, 50 – 60 Hz, 20A circuit
Gas supply	• CDA: 20 – 120 psi, 6 mm push-to-connect fitting* • >99% CO2: 20 – 120 psi, 6 mm push-to-connect fitting* ** Other NPT compatible fitting options available*
Sterility	• Integrated BSC Class II, A1 compatible airflow • Dual ULPA filtration. Exceeds Cleanroom Class 100, ISO Class 5
Recommended clearance	• **Front:** 36–48 in (90–120 cm) • **Rear:** 24 in (60 cm) • **Left/Right Sides:** 24 in (60 cm)
Other connections	Ethernet, USB
Working environment	• Temperature: 64 – 79°F (18 – 26°C) • Humidity: 20 – 60% • Altitude: <6,500 ft (2,000 m)

ATTRIBUTES

Dimensions	• **Width:** 46 in/116.8 cm • **Depth:** 34 in/86.4 cm • **Height:** 71.5 in/181.6 cm
Weight	• **Crated for shipment:** 1,700 lb (770 kg) • **Free-standing:** 1,260 lb (571 kg)

SUPPORTING INSTRUMENTS AND COMPONENTS

Name	Description	Part Number
Beacon Quest™ Optofluidic System, negative pressure	5-color plus brightfield, import well lid	110-08044
Culture Station™ instrument	4-culture modules	110-08001

Chips	Part Number
OptoSelect® 1750 chip	750-00018
OptoSelect® 3500 chip	750-00012
OptoSelect® 11k chip	750-08090
OptoSelect® 14k chip	750-00021
OptoSelect® 20k chip	750-00019

Bruker
5858 Horton Street
Suite 320
Emeryville, CA 94608

Tel: +1-510-858-2855
Website: brukercellularanalysis.com

FOR RESEARCH USE ONLY. Not for use in diagnostic procedures.