DELTA
LIFE SCIENCE

inQuiQ™

www.deltalifescience.nl

Introducing Delta Life Science

Founded in 2018 as a spin-off from TNO (Dutch Organisation for Applied Scientific Research), Delta is located at the heart of innovation in the Rotterdam Science Tower. Our mission is to make multiplexed, label-free biosensing accessible to all. To achieve this, we developed an innovative technology: Nanophotonic Evanescent field Sensing (NES).

ASSAY DEVELOPERS **ACADEMIC RESEARCHERS** **PHARMA SCIENTISTS**

NES Technology

Our biosensing technology uses photonic integrated circuits for rapid, high-sensitivity, label-free detection of biomolecules. Our chip-based platform uses light to perform measurements on a silicon chip. Unlike conventional silicon chips that use electronic circuits, our platform uses microscopic fibre optics, known as waveguides, to direct light through the chip.

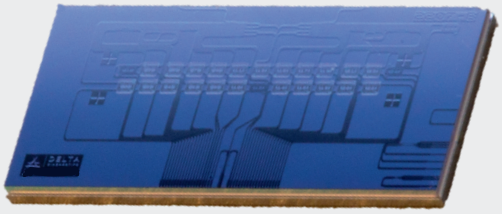

Figure 1. Biosensor based on photonic integrated circuits.

These waveguides enable the integration of numerous small sensors on a single chip, allowing for quantitative and kinetic analyses of multiple biomolecules from a single sample. This makes it a valuable tool for life sciences research.

HIGHER SENSITIVITY **4X FASTER RESEARCH** **3X FASTER ASSAY DEVELOPMENT**

inQuiQ™

With Delta's NES technology at its core, the inQuiQ™ instrument is set to transform the landscape of biosensing. The inQuiQ™ allows scientists to conduct highly sensitive, multiplexed analyses with ease.

inQuiQ™ OFFERS

Figure 2. inQuiQ™ instrument.

- **16-plex measurements:** obtain more data points from a small sample on a reusable sensor;
- **Complex matrices:** improved measurements in serum, plasma, and supernatant due to the combination of a silicon chip and polycarboxylate hydrogel;
- **Real-time data:** immediate results through label-free biosensing;
- **Compact design:** the use of NES technology enables sophisticated analyses taking up limited space (30 x 40 cm) on your lab bench;
- **Wide range of sample volumes:** supports sample volumes from 25 µl to 2 ml for diverse experimental needs;
- **Cost-effective solution:** a premium instrument at an affordable price without compromising results.

Versatile applications of the inQuiQ™

The inQuiQ™ instrument is designed for customisable assays throughout the field of life sciences. Its advanced NES technology enables highly sensitive and multiplexed analyses, making it a valuable tool for various applications. From drug development to food safety, studying the interaction of any combination of biomolecules.

MONOCLONAL ANTIBODY SYNTHESIS:

Improve the development of monoclonal antibodies by screening hybridoma cultures to identify the most promising clones using minimal sample volumes. The inQuiQ™'s multiplexing capabilities allow for simultaneous measurements of an antibody's specificity, affinity, and cross-reactivity with other ligands from a single sample, saving time and resources. Additionally, the reusable sensors contribute to cost efficiency and sustainability in your research;

TRANSCRIPTION FACTOR-DNA INTERACTIONS:

Investigate gene expression linked to various diseases by testing multiple transcription factor-DNA interactions simultaneously for higher throughput. This helps map binding affinities and identify key regulatory elements, aiding in the understanding of genetic mechanisms and potential gene therapies;

IDENTIFYING AND VALIDATING DISEASE BIOMARKERS:

Efficiently identify biomarkers correlating with disease presence and progression by analysing serum samples from patients. This process speeds up biomarker discovery and aids in developing more precise diagnostic tests, leading to earlier detection and better patient outcomes;

CHARACTERIZING GPCR-SMALL MOLECULE INTERACTIONS:

In drug development, the inQuiQ™ is used to screen small drug molecules against various GPCR variants in parallel for increased throughput. This process provides detailed kinetic profiles and helps identify compounds with the highest affinity and specificity.

Testimonials

> The maximum sample volume that can be drawn from mice is about 100 microliters. For our research, we need to maximize what we can measure from these small samples. The highly multiplexed detection technology which is able to measure many different biomolecular interactions simultaneously using minimal sample volumes, is therefore essential for us.

- Prof. Dr. F. Grosveld, Erasmus MC / Harbour Antibodies

> We see great use in the fact that the technology combines high sensitivity label-free detection with the ability to multiplex. This is important not only for high throughput kinetic screening, but also for antibody lead candidate screening, for which now typically less quantitative ELISA's are used.

- Michael Schraeml, PhD, Roche Diagnostics

Increased throughput

Is the inQuiQ™ a perfect addition to your lab, but your need for throughput has increased? In 2025 Delta will launch its second instrument, the inQuiQ™ 768. The add-on to the base model integrates an autosampler, enabling analysis of two well plates in one run. Additionally, a GxP version will be available, compliant with 21 CFR part 11 regulations.

Follow us on LinkedIn to stay updated on this exciting release!

Attend a Webinar

Interested in seeing how the inQuiQ™ can transform your research? Sign up for one of our webinars to see the instrument in action and learn more about its capabilities and benefits. Visit our website or scan the QR code to reserve your spot today!

Specifications

- Detection technology: Optical waveguides-NES
- Information provided: Kinetic and affinity data, quantitation
- Data presentation: Monitoring of real-time sensorgrams
- Injection volume range: 1 µL – 2 mL
- Minimal sample volume: 25 µL
- Flow rate range: 1 to 100 µL/min
- Data collection rate: ~1.4 Hz
- Sample capacity: 10x 2 mL
- Running buffer capacity: 2x 50 mL
- Regeneration buffer capacity: 1x 50 mL
- Analysis temperature range: 13°C to 40°C
- Sample refractive index range: Unlimited
- Number of flow cells: 4 channels (4 sensor spots in each channel)

TYPICAL WORKING RANGES

- Association rate constant (ka): Proteins: up to 3 × 10^9 M^-1 s^-1; LMW molecules: up to 5 × 10^7 M-1 s-1
- Dissociation rate constant (kd): 10^-6 to 1 s^-1
- Sample concentration: ≥ 1 pM
- Molecular weight detection: No lower limit for organic molecules
- Short term noise: Typically < 0.1 RU (RMS) or < 0.01 RU (RMS) with high sensitivity sensors
- Baseline drift: Typically < 0.3 RU/min
- Immobilized interactant consumption: Typically 0.03 to 3 µg/flow cell

INSTRUMENT DIMENSIONS

- W × H × D: 30 cm × 36 cm × 40 cm
- Net Weight Total: 17 kg

USE-CASES

- Biomolecule Kinetics & Affinity
- Yes/No Binding
- Specificity
- Quantitation
- Epitope Mapping
- Competitive Assays

FUNCTIONAL LAYERS ON CHIPS

Our chips have hydrogels with polycarboxylate chains of different lengths (30nm, 200nm, 1000nm, 1500nm) and densities (low, medium, high)

Specific functionalisations can be:

- Protein A/G
- Carboxyl groups
- Azide groups
- Streptavidin/Neutravidin
- Biotin
- Lipophilic surface
- And more

SAMPLE TYPES

From small molecule drug candidates to high molecular weight proteins (also DNA, RNA, peptides, polysaccharides, and virulent proteins) in various sample matrices (e.g., in DMSO containing buffers, plasma and serum).

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