Bioanalysis ZONE

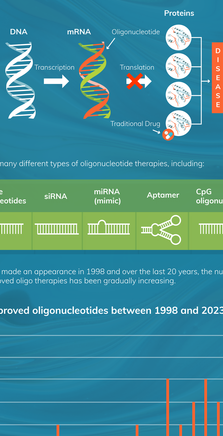
GYROS PROTEIN Technologies

Gyrolab® hybridization assays for oligonucleotide analysis

Oligonucleotides have burst onto the bioanalysis scene in the last two decades and their analytical techniques have had to keep up with their development. Explore the types of oligos currently on the market and how hybridization assays on the Gyrolab microfluidic platform can achieve highly sensitive, automated assays to support them.

Development of oligo therapies on the rise

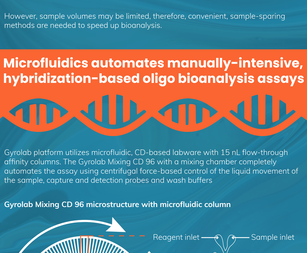
Oligonucleotide therapies are short, modified or unmodified, single-stranded nucleic acid molecules targeted to a specific gene or protein to modulate gene expression.



There are many different types of oligonucleotide therapies, including:

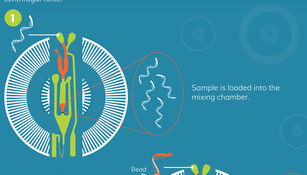
Oligos first made an appearance in 1998 and over the last 20 years, the number of FDA-approved oligo therapies has been gradually increasing.

FDA approved oligonucleotides between 1998 and 2023



Bioanalytical challenges of oligo therapies

Bioanalysis of oligonucleotide therapies requires **specificity** and high **sensitivity** in diverse matrices such as:

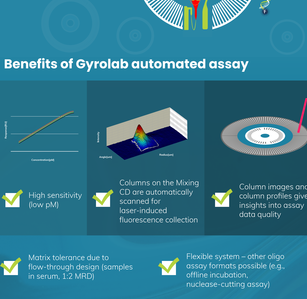


However, sample volumes may be limited, therefore, convenient, sample-sparing methods are needed to speed up bioanalysis.

Microfluidics automates manually-intensive, hybridization-based oligo bioanalysis assays

Gyrolab platform utilizes microfluidic, CD-based labware with 15 nL flow-through affinity columns. The Gyrolab Mixing CD 96 with a mixing chamber completely automates the assay using centrifugal force-based control of the liquid movement of the sample, capture and detection probes and wash buffers

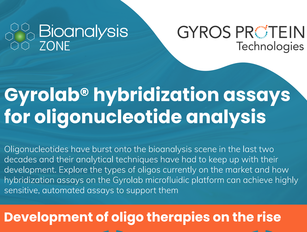
Gyrolab Mixing CD 96 microstructure with microfluidic column



Hybridization assay design

Streptavidin-coated beads containing a biotin-labeled complementary probe capture the oligo therapeutic. An Alexa Fluor 647 detection probe allows automated laser-induced fluorescence (LIF) detection. Samples and reagents are loaded onto the inlets on the CD and are then moved through the CD microstructure with centrifugal force.

Benefits of Gyrolab automated assay



- High sensitivity (low pM)
- Columns on the Mixing CD are automatically scanned for laser-induced fluorescence collection
- Column images and column profiles give insights into assay data quality
- Matrix tolerance due to flow-through design (samples in serum, 1:2 MRD)
- Flexible system – other oligo assay formats possible (e.g., offline incubation, nuclease-cutting assay)
- Improves lab workflows
- Automated, high-sensitivity data collection gives insight to the quality of each data point

Scan the QR code to find out more about Gyros Protein Technologies' products

This infographic has been created as part of a Bioanalysis Zone feature with Gyros Protein Technologies.

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