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committed to enhance scientific excellence

Therapeutic Oligonucleotides

- From R&D to **GMP grade** manufacturing, from Research to Clinics
  - Lead Discovery
  - Lead Optimization
  - Preclinical Development
  - Clinical Trials
- **Support and Services include**
  - Design of Experiment (DOE)
  - Process Characterization
  - Process Development
  - Process Validation
  - IND & NDA Filing support
- Scale-up & Process Transfer
- Portfolio covering most prevalent types of therapeutic oligonucleotides
  - CpG oligonucleotides - excipients/adjuvants
  - Antisense oligonucleotides (ASOs)
  - siRNA
  - Gapmers/RNA-DNA Chimera
  - miRNA
  - sgRNA for CRISPR/Cas technology
  - Aptamers
  - Oligonucleotide-peptide/lipid/sugar conjugates for tissue specific API delivery
- Exhaustive panel of QC Analytical methods and services
- Custom formulation, Fill & Finish support and services.

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We have been focused on custom oligonucleotides for more than 25 years – still are . . .

metabion evolved into the one-stop-shop for your oligo requirements from

- R&D
- Diagnostic to
- **Therapeutic** applications.

A globally renowned **“oligo boutique” and best-in-class** provider of custom **high-quality oligos.**

In this together . . .

In Italy with metabion

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Custom Synthesis of High Quality Oligos

Spotlight on

Therapeutic Oligonucleotides

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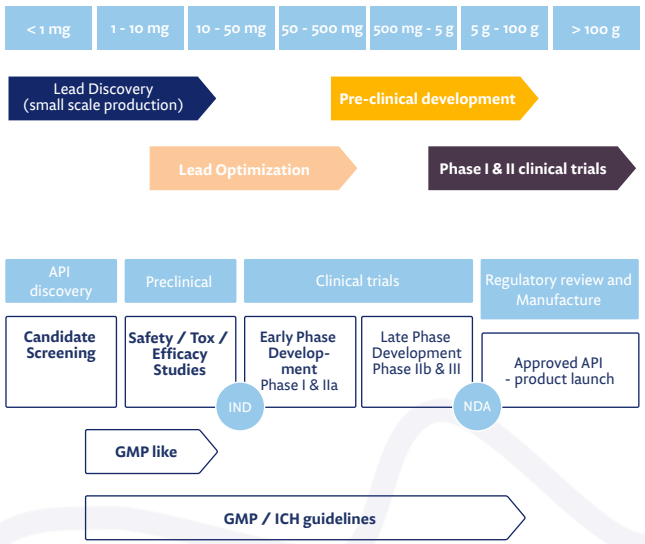
Therapeutic Oligonucleotides

From R&D to GMP grade manufacturing, support and services, scale-up & Process transfer from Research to Clinics



Portfolio covering most prevalent types of therapeutic oligonucleotides

- Antisense oligonucleotides (ASOs)
  - siRNA
  - miRNA
  - Gapmers/RNA-DNA Chimera
  - Aptamers
- Oligonucleotide-peptide/lipid/sugar conjugates for tissue specific API delivery
- sgRNA for CRISPR/Cas technology
- Immunostimulant ONs/CpG oligonucleotides (ISOs)

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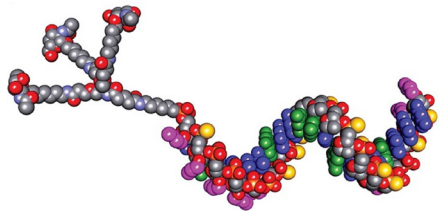
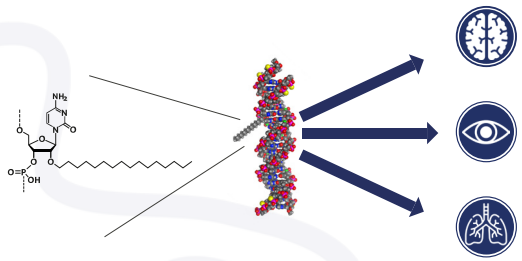
Custom Synthesis of High Quality Oligos

Modifications covering

- Sugar modifications, i. e. LNA, 2´-F, 2´-OMe, 2´MOE, ...
- Backbone modifications, i. e. Thiolation (PTO) ...
- 5´and internal modifications, i. e. 5mC, 5-hydroxyC, 8-bromoG, 8-aminoC, 2-thioT, GalNac, Cholesterol, PEG, Peptide, ...
- 3´ modifications, i. e. GalNac, Cholesterol, PEG, Peptide, ...



N-acetylgalactosamine molecule (in gray) conjugated ON to increase delivery to the hepatocytes of the liver



Lipophilic-siRNA conjugate for delivery to extrahepatic tissues.

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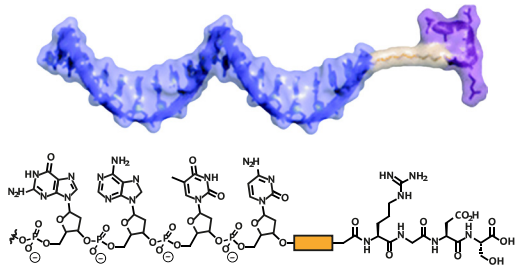
Therapeutic Oligonucleotides



Peptide oligonucleotide conjugate (POC)

Exhaustive panel of QC Analytical methods and services

- Purity by UPLC/HPLC
- Identity by Mass Spectrometry (ESI)
- Appearance, pH, Osmolality
- Bioburden, Endotoxin level
- Phosphorothioate - Phosphate content
- Residual solvents, Residual heavy metals, Water content, Sodium content
- Stability studies

Fill & Finish support and services

Extensive downstream processing equipment and capabilities

- Chromatography systems
- Ultrafiltration equipment
- Lyophilization services
- Liquid or powder filling