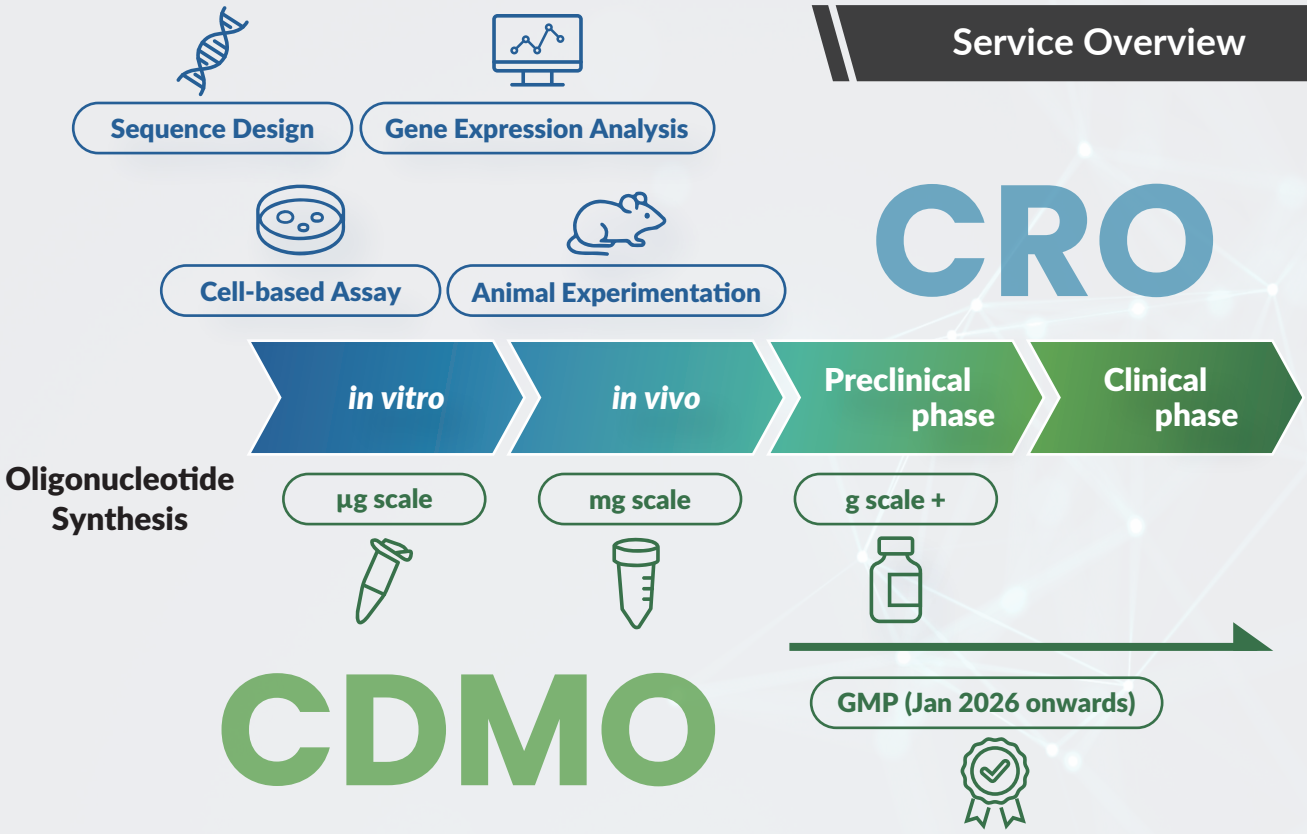
MITSUBISHI GAS CHEMICAL

Oligonucleotide API CRDMO Service

Mitsubishi Gas Chemical combines its analytical technology and knowledge of Good Manufacturing Practice (GMP) with Hokkaido System Science's proven nucleic acid synthesis expertise to provide comprehensive CRDMO services **from early research to clinical manufacturing.**

Service Overview



- **Sequence Design**
  - ASO design
  - Off-target prediction (GGGenome)
- **Gene Expression Analysis**
  - RNA-Seq / Microarray for comprehensive expression profiling
- **Cell-based Assay**
  - *In vitro* functional testing and sample analysis
- **Animal Experimentation**
  - *In vivo* studies using genetically modified mice
- **Oligonucleotide Synthesis : µg scale**
  - RUO-grade synthesis of ASOs, dsRNAs, miRNA mimics, antagomiRs, aptamers and more
- **Oligonucleotide Synthesis : mg scale**
  - *In vivo*-grade synthesis with sodium salt exchange and endotoxin testing
  - Conjugation options available for drug delivery systems (DDS)
- **Oligonucleotide Synthesis : g scale +**
  - Clinical and commercial manufacturing on GMP level (Jan 2026 onwards)

Modification Options

Flexible chemical modifications enable precise control of stability, affinity, delivery, and detection, advancing oligonucleotide projects at every stage.

Nucleic Acid Therapeutics
- Phosphorothioate (PS)
- 2'-MOE
- 2'-F
- 2'-OMe
- 5-Methyl-dC
- 5'Vinyl Phosphonate, 2'-OMe-U (5'VP)
- Locked Nucleic Acid
- Acyclic Nucleic Acid * (SNA / iL-*a*TNA)

Lipid & Ligand Conjugates
- Tri-GalNAc
- dR-GalNAc
- GalNAc [C3]
- Cholesterol [TEG]
- Tocopherol [TEG]

Ligation
- 5'Phosphate

Fluorescent Dyes & Quenchers
- ATTO
- Fluorescein (6-FAM)
- Tetrachlorofluorescein (6-TET)
- Hexachlorofluorescein (6-HEX)
- Cyanine3
- TAMRA
- Rhodamine (ROX)
- Cyanine5
- BHQ-1 / 2 / 3
- Dabcyl

Detection & Purification
- Biotin [standard]
- Biotin [TEG]
- DIG

Reactive Functional Groups
- Amino Modifier [C6]
- Amino-dT [C6]
- EC Amino Linker
- Thiol
- Azide
- Alkynyl
- DBCO [TEG]

Terminators
- 3'Phosphate
- 2',3'-ddC
- idT

Spacers
- Spacer C3
- Spacer 9
- Spacer C12
- Spacer 18
- d-Spacer
- r-Spacer

Modified DNA Bases
- deoxyInosine (dI)
- deoxyUridine (dU)
- 5-hydroxymethyl-dC
- N6-Me-dA
- 8-oxo-dG
- 8-oxo-dA
- 5-Bromo-dU
- 8-Bromo-dA
- pseudo-dU
- 8-Amino-dA
- Reverse (Inverse) - Abasic

Modified RNA Bases
- riboInosine (rI)
- 5-Methyl-rU (rT)
- pseudo-rU
- 2,6-diaminopurine (DAP)

Antibiotics
- puromycin

Photo-Crosslinkers
- CNV-K
- CNV-D

* Available only under an agreement with Nagoya University.

Please feel free to contact our technical support team for any custom requests or modifications not listed here.

Chemically Synthesized Long RNA

We intend to provide high-quality RNA synthesis to support diverse research applications.

Up to 300 mer

Long RNA synthesis

- Available from µg to g quantities
- Custom chemical modifications supported

Customer-Supplied Amidites

Customer-supplied amidites can be accommodated, subject to compatibility.

Custom Inputs

- Technical fit confirmed up front
- Parameters calibrated to your platform

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