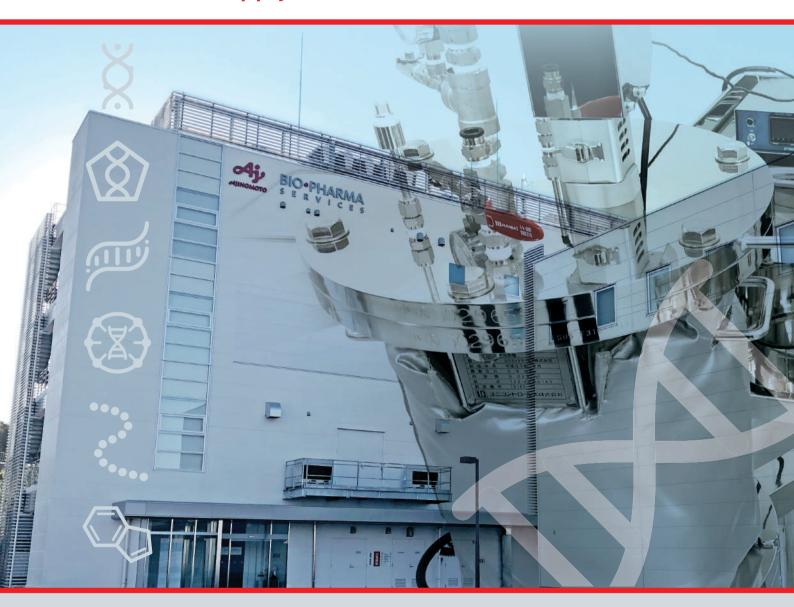


Oligos and Peptides

A Seamless Supply from Research to Commercial Scale



THE POWER TO MAKE

A Wide Range of Oligo and Peptide Manufacturing Options to Meet Your Needs

Ajinomoto Bio-Pharma Services is an established premier provider of high quality, scalable, custom oligonucleotides and peptides. Our knowledgeable and highly skilled scientists employ both traditional solid phase production and our innovative AJIPHASE® synthesis technology to develop and manufacture highly-pure DNA/RNA oligos, PMOs and peptide chains.

Aji Bio-Pharma offers the capacity and quality to scale your process through clinical development and commercialization, and our service offerings have been designed to meet the current and future needs of our clients in order to ensure a stable supply and seamless scale up of your promising therapeutics.





Solid Phase Manufacturing

At our dedicated oligonucleotide site in Osaka, Japan, we offer contract development and manufacturing of custom oligos via traditional solid phase synthesis. Our service offerings include scale up development and analytical testing of your oligos for either cGMP or non-GMP use.

200

PHASE II

(~200 g)

With our new state-of-the-art 2,000 m 2 Oligo API Manufacturing Center, we offer a synthesis capacity of μg to 20 kg. Our Oligo API Manufacturing Center is equipped with two fully-separated production lines, a dedicated warehouse, sampling room, and QC lab.

Offerings

- Small scale custom oligonucleotides
- Long RNA chains (~140 mer)
- Long chimera DNA/RNA chains by enzymatic ligation
- ASO
- siRNA
- Aptamers
- miRNA (inhibitor & mimic)
- CpG-ODN
- Decoy RNA

CAPABILITIES FROM µg - kg

Small Scale

- μg mg quantitie
- 13 nS-8 synthesizers
- HPLC purification
- Lab type desal
- Lab type lyophilization

Mid Scale

- 10 mg 10 g quantities
- Two OP-10 & 4 OP-10 synthesizers
- MPLC & HPLC
 purification
- UF desalting
 - Vial & bulk lyophilization

cGMP Scale

- 10 g to 20 kg quantities
- Two OP-400 & one OligoProcess synthesizers
- MPLC purification
- UF desalting

COMMERCIAI

~hundreds k

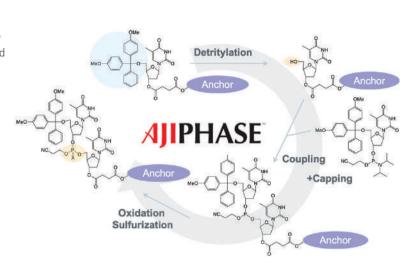
Vial & bulk lyophilization

AJIPHASE Manufacturing

At our manufacturing facilities in Japan and Belgium, we are able to produce large scale oligonucleotides and peptides via AJIPHASE® technology. Starting with the small quantities of our traditional solid phase synthesis, we are able to scale up using our AJIPHASE technology, providing highly cost-effective and pure oligonucleotides and peptides, with less waste byproducts.



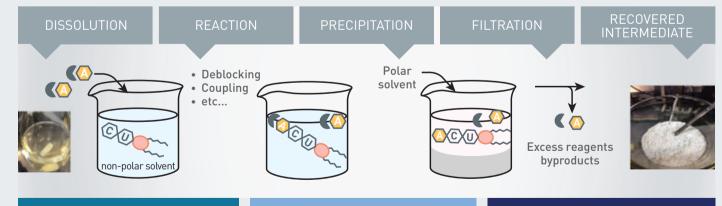
- Phosphorodiamidate Morpholino Oligonucleotides (PMO)
- Large scale peptides



A Robust, Proven Technology

The AJIPHASE technology is a hybrid of traditional solid phase and solution phase synthesis, using an anchor in place of a resin, which provides a homogeneous mixture. After the reaction occurs, the anchor, which is very not soluble in polar solvents, precipitates and is filtered out with the excess reagents and byproducts, providing the recovered intermediate, all in one reactor.

Quality and purity profiles show no difference between AJIPHASE and traditional solid phase synthesis. This advanced process is highly scalable (up to 200 kg) with no additional expensive special equipment, providing cost-effective and pure oligonucleotides and peptides, with less waste byproducts. AJIPHASE allows for optimized time, cost, and value when scaling your products to commercial quantities.



DNA / RNA OLIGONUCLEOTIDES

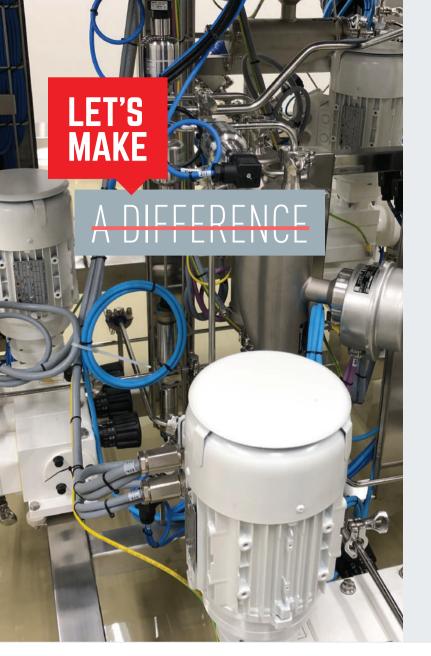
- High-yield process
- High purity
- Equivalent quality (vs. solid phase)

PHOSPHORODIAMIDATE MORPHOLINO OLIGONUCLEOTIDES

- Track record in hundreds of kg scale
- High purity
- Superior quality (vs. solid phase)

PEPTIDES

- High purity (without HPLC purification)
- kg batch scale
- Applicable to long peptide chains



Product Quality & Analytical Testing

- Pyrogen-free materials
- Strict quality control is performed using various analyzers
- RP-HPLC
- IEX-HPLC
- MALDI-TOF/MS
- Residual salts testing and removal
- Endotoxin testing
- Stability testing
- Conjugation technology
- Analytical development
- Equivalency in quality between batches
- Scale up design

Product Applications

- Research on basic drug discovery system
- Assay of disease target genes found in vitro in disease model animals
- Innate immune activation such as TLR pathway
- Examination at the development stage of nucleic acid medicine
- Material supply of diagnostics



THE POWER TO MAKE —

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