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FY2022 Ajinomoto Co., Inc. Business Briefing

Growth Strategy for the Bio-Pharma Services Business

AJINOMOTO BIO•PHARMA SERVICES

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August 25, 2022

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Content for Today

Ajinomoto Bio-Pharma Services (CDMO Services)

- Overview
- Oligonucleotide contract manufacturing service
- Other initiatives

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Ajinomoto Bio-Pharma Services

MISSION WE HELP TO IMPROVE THE HEALTH OF HUMANKIND.

TO BE A LEADING, TRUSTED, AND INNOVATIVE PARTNER TO OUR CUSTOMERS AND OUR EMPLOYEES. **VISION**

Continue to create ASV through business unique to the Ajinomoto Group by maximizing the Group's tangible and intangible assets.

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Global Manufacturing Sites

Ajinomoto Co., Inc. Tokai Plant
- Small molecule APIs
- Oligonucleotides

AJIPHASE

Research Institute for Bioscience Products & Fine Chemicals, Ajinomoto Co., Inc.
(The company's core site for technology creation)
- Large molecule APIs
- ADCs

CORYNEX®

AJICAP TALAMAX®

S.A. Ajinomoto OmniChem N.V. (1989 -)
- Small molecule APIs
- Natural extracts
- Oligonucleotides AJIPHASE

Ajinomoto Bio-Pharma Services India Private Limited (2011 -)
(Became a wholly-owned subsidiary of Ajinomoto OmniChem in 2020)
- Small molecule APIs

GeneDesign, Inc. (2016 -)
- Oligonucleotides (Solid-phase synthesis)

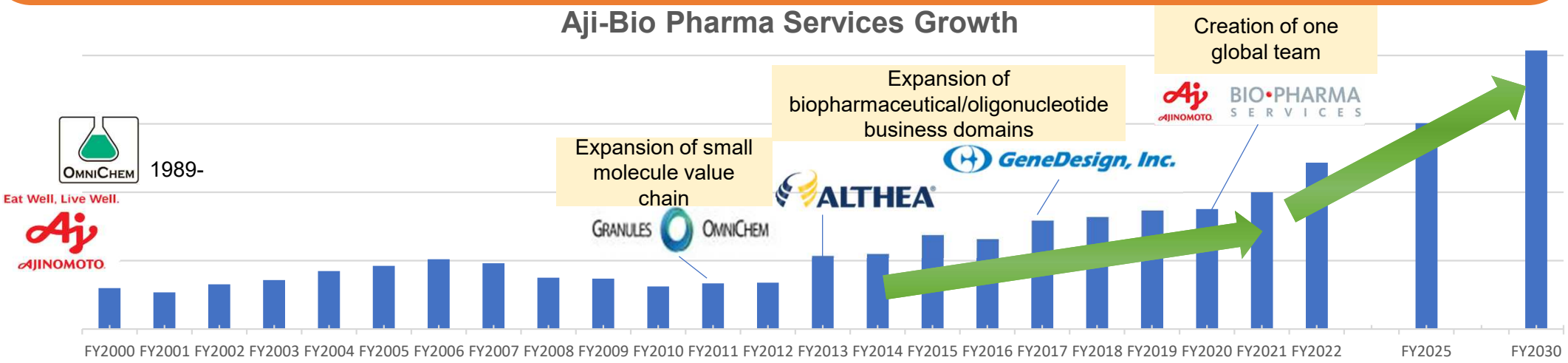
Ajinomoto Althea, Inc. (2013 -)
- Large molecule APIs
- Aseptic filling
- ADCs

CORYNEX®

AJICAP TALAMAX®

Growth of Contract Manufacturing Business at the Ajinomoto Group

- **We combine a wide range of services from small, medium and large molecules through to formulation and aseptic filling and have developed systems that meet the needs of a broad range of customers from start ups through to major pharma companies.**
  We have gained the trust of many of our customers to be a preferred supplier.
- **We offer high value-added services leveraging proprietary technologies (CDMO rather than CMO).**
- **We have improved ROIC by optimizing our production system through global collaboration (application of *AJIPHASE*® from small molecule field).**



	Present	Measures for growth
Large molecules	Strengthening Fill & Finish and ADC businesses (Althea) and developing technologies such as *CORYNEX*®	Strengthen proprietary technologies (antibodies-*TALAMAX*®, *ADCs-AJICAP*®) and expand into regenerative medicine and cell therapy
Medium molecules	Services using solid-phase synthesis (GeneDesign, Inc.) and liquid-phase synthesis (*AJIPHASE*®)	Boost manufacturing capacity, strengthen global marketing structure, and strengthen development of new manufacturing methods (siRNA, etc.)
Small molecules	Largest pharmaceutical market, supporting stable growth	Enhance technological differentiation, including continuous flow technology-based processes, and service capabilities

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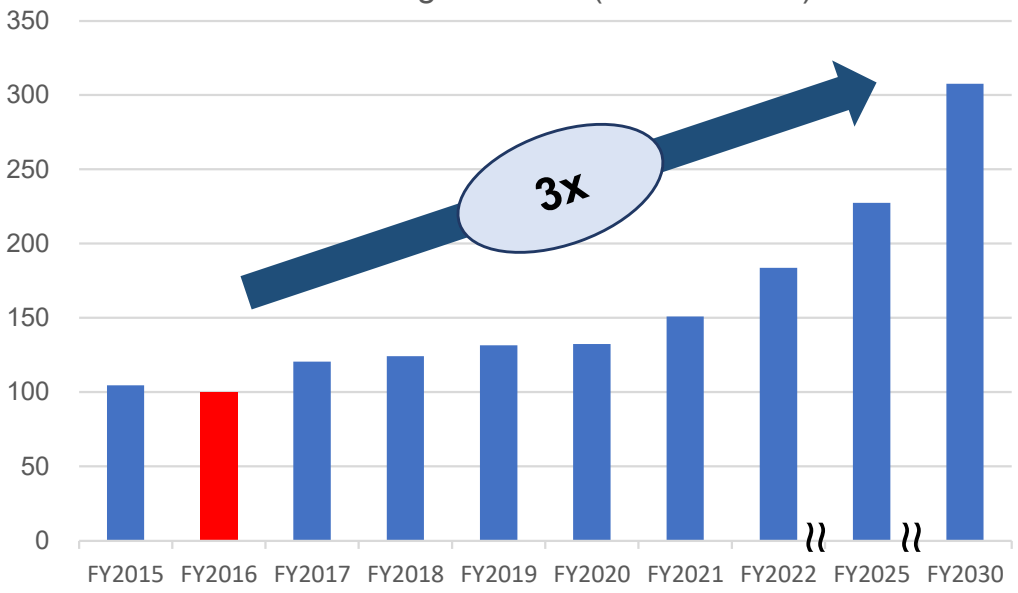
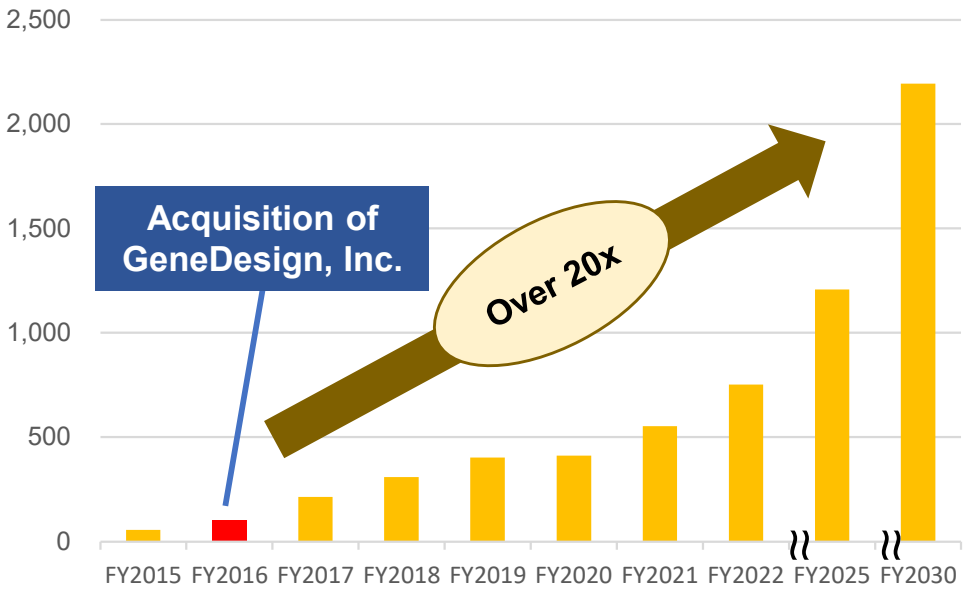
Sales Trends and Forecasts in the Oligonucleotide Contract Manufacturing Business

Oligonucleotide drugs will be the Ajinomoto Group's next growth driver

Sales forecast for Ajinomoto contract manufacturing business (FY2016=100)



Sales forecast for oligonucleotide contract manufacturing (FY2016=100)



Forecast based on “pipeline numbers × forecast production volume × risk factors”

Strategy for growth

- **Secure manufacturing capacity six times greater than FY2021 by FY2027 by reshuffling portfolio and rebuilding global production structure**
- **Expand market share through new technologies: Hybrid manufacturing methods using enzymes**
- **Develop customers through a globally integrated system**

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Nucleic Acid-Based Drugs

Combine the advantages of small and large molecule therapeutics.
Rapidly increasing results and entering a growth phase.

	Small molecule therapeutics	Nucleic acid-based drugs	Large molecule therapeutics
Manufacturing method (cost)	○ Chemical synthesis (low)	○ Chemical synthesis (low)	Biologically manufactured (high)
Intracellular targeting	○ Can be targeted	○ Can be targeted	Cannot be targeted
Intracellular RNA targeting	Not possible	○ Possible	Not possible
Specificity to target molecules	Low	◎ Higher	○ High
Side effects	More	○ Fewer	○ Fewer
Efficacy	Lower	○ Higher	○ Higher

Partially prepared by Ajinomoto Co., Inc. based on Global Medium Molecule Therapeutics Market (TPS)

[Changes in the environment between 2016 and 2022]

No. of approved nucleic acid-based drugs: **5→16** (**triple**)

No. of nucleic acid-based drug clinical trials: **Approx. 300→ approx. 700 (double)**

Research by Ajinomoto Co., Inc.

- **Nucleic acid-based drugs are continuing to receive attention as the next new modality after antibody drugs.**
- **Approvals have gained momentum since 2016 and many products have been launched.**
- **Clinical trials are underway for a broad range of target diseases.**

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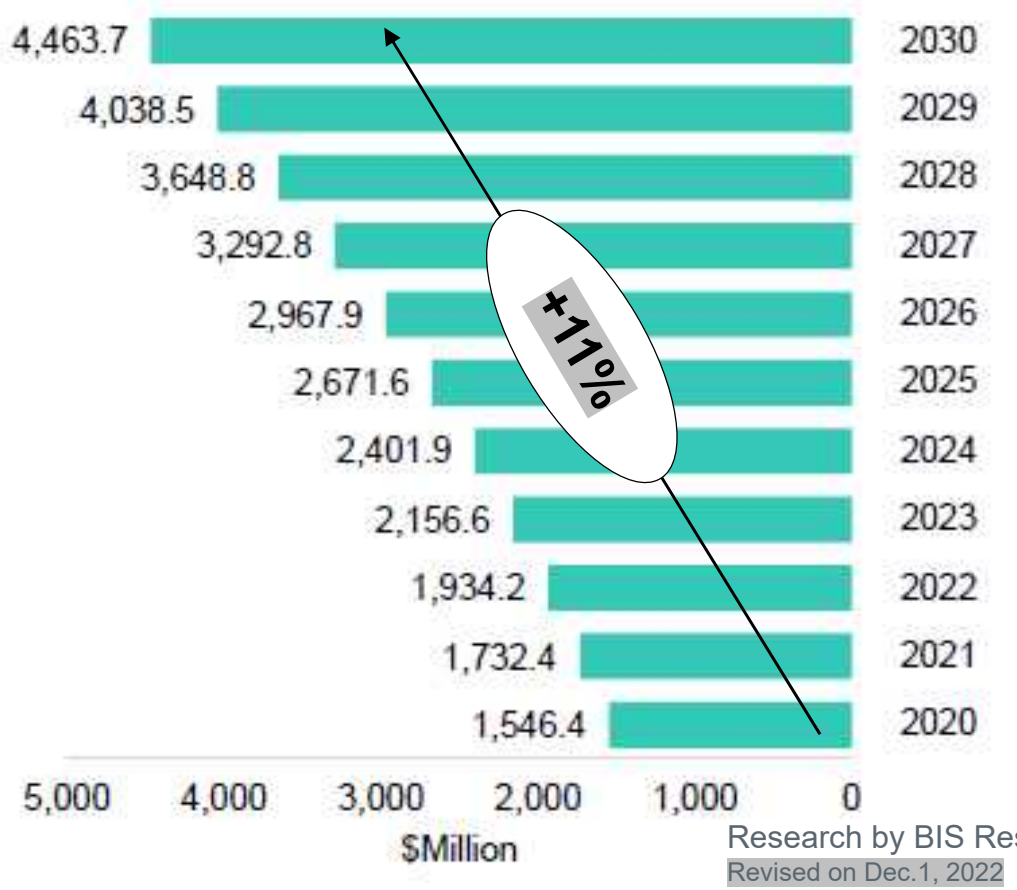
CDMO Market for Nucleic Acid-Based Drugs

In the growth stage as an industry, the nucleic acid-based drug CDMO market is expected to reach approx. ¥450 billion in 2030



Research by BIS Research
Revised on Dec.1, 2022

There are several types of nucleic acid-based drug within the industry.
Currently, the main arena for Ajinomoto is oligonucleotides.

Nucleic acid type	Role
Oligonucleotides	Therapeutics
mRNA	Vaccines
Vectors	Gene therapy

Main players in oligonucleotide manufacturing

Nitto Avecia (U.S.)
Agilent (U.S.)
BioSpring (Germany) and others

- **Expansion of manufacturing capacity and rise in new entrants alongside increase in number of products on the market and products under development**
- **Tendency for manufacturing orders to be concentrated on a few leading CDMOs**
- **Keys to competiveness are unique strengths and differentiating factors**

Features of Ajinomoto's Oligonucleotide Contract Business

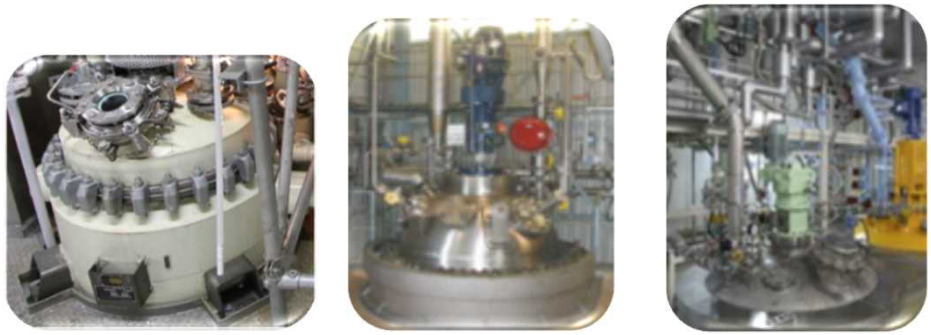
Only CDMO using *AJIPHASE*®, a proprietary liquid-phase manufacturing technology, in addition to solid-phase manufacturing technology

Solid-phase synthesis (Osaka)

Fast Synthesis, Limited Volume

- World's **mainstream manufacturing technology**
- **Fast** but limited 1B volume (depends on synthesizer)
- Requires dedicated synthesizer
- Uses large volumes of organic solvents and raw materials

AJIPHASE®



Slower Process, Large Volumes

- **World's only industrial-scale liquid-phase manufacturing technology**
- **General-purpose synthesizing equipment can be used**
- Enables **large volume manufacturing**
- Analysis during synthesis is possible = enables development of **high quality process**
- Uses low volumes of organic solvents and raw materials

Proven record in commercialization of nucleic acid-based drugs

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Comparison of Solid-Phase Synthesis and *AJIPHASE*® Liquid-Phase Technology

AJIPHASE® is more suitable for mass production than solid-phase synthesis

Solid-phase synthesis	vs	AJIPHASE®
– a few Kg	SCALABILITY	– 200 Kg
20min/Base	SPEED	1 day/Base
Excess	SOLVENTS	Reduced
Excess	REAGENTS	Equivalent

Issues with solid-phase synthesis

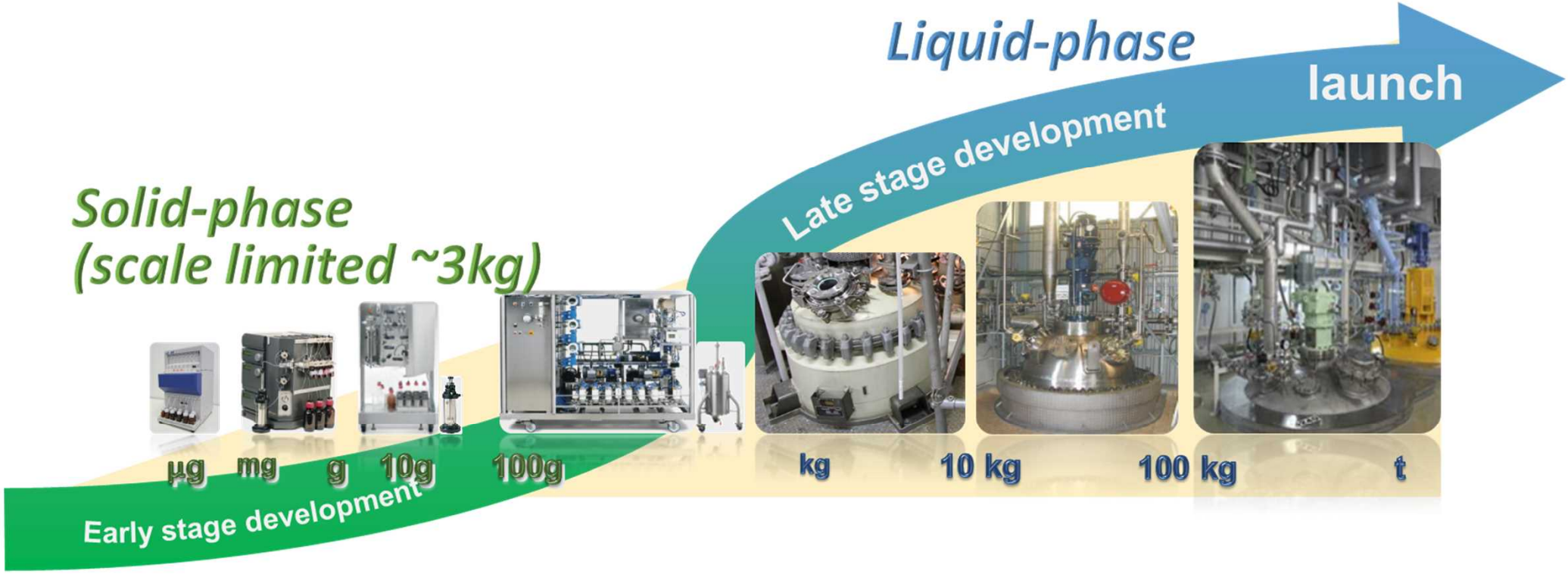
Production volume per 1B
Cost of mass production

Solution

AJIPHASE® technology with different strengths from solid-phase synthesis

Strengths of Ajinomoto's Oligonucleotide Contract Business

Ability to make proposals tailored to customer needs (Timing and volume of supply)



BIO•PHARMA Osaka SERVICES

AJIPHASE®

- **Development stage, timing and volume of required supply are not constants.**
- **Offers flexible use of solid-phase synthesis and *AJIPHASE*® technologies.**

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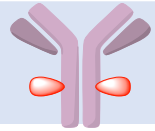
Solutions Business that Contributes to Advanced Medical Care Modalities

Achieve higher added-value in CDMO business through Ajinomoto's proprietary manufacturing technology and solution development capabilities that address the API demand, performance, quality, and development speed necessary to achieve advanced medical care modalities

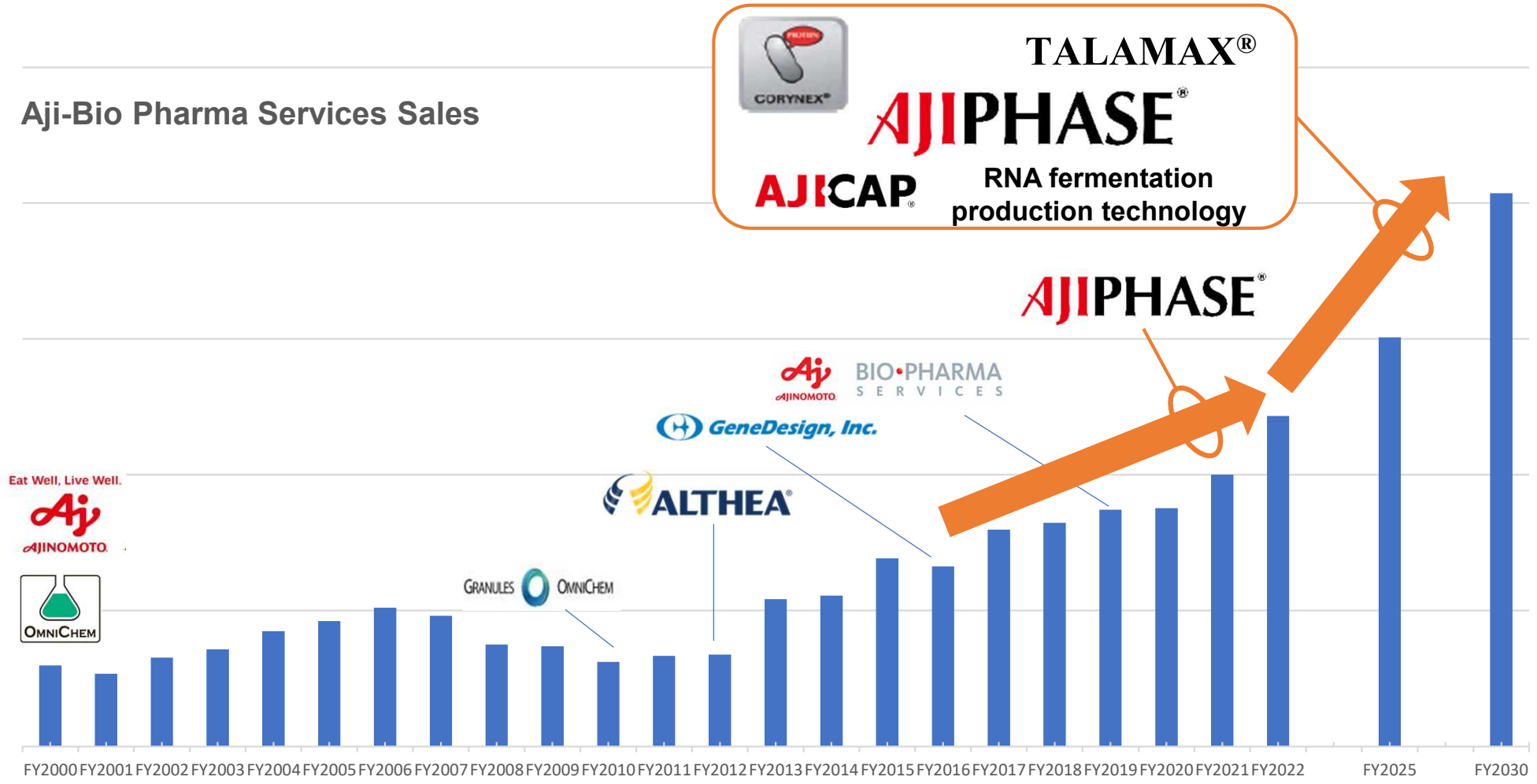
Ajinomoto Group's solutions

Advanced medical care modalities

Ajinomoto Group's solutions		Advanced medical care modalities
AJIPHASE®	Proprietary efficient manufacturing technology for oligonucleotides, which have an expanding market as a therapeutic agent for intractable diseases. Already successfully commercialized.	Oligonucleotides 
CORYNEX® TALAMAX®	Attracting attention as a manufacturing technology for antibody-like proteins and antibodies without sugar chains.	Proteins 
AJICAP®	Breakthrough technology to control the number of drugs that bind to antibodies.	Antibody drug conjugates 
RNA fermentation production technology, etc.	mRNA is attracting attention for novel coronavirus vaccines.	mRNA, gene therapy, etc. 

Development ecosystem

Expansion of the Bio-Pharma Services Business



Contribute to further sales and profit growth by strengthening Ajinomoto's proprietary technology, such as *AJIPHASE*®, and solutions capabilities based on the technology and customer base cultivated through the CDMO business

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Website for the Bio-Pharma Services Business

The website features the proprietary platform technologies of the Ajinomoto Bio-Pharma Services business.

https://ajibio-pharma.ajinomoto.com/

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- **Forward-looking statements, such as business performance forecasts, made in these materials are based on management's estimates, assumptions and projections at the time of publication. A number of factors could cause actual results to differ materially from expectations.**
- **This material includes summary figures that have not been audited so the numbers may change.**
- **Amounts presented in these materials are rounded down.**