

Eat Well, Live Well.



Ajinomoto Co., Inc. Business Briefing

Growth Strategy for the Bio-Pharma Services Business



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Bio-Pharma Services Department

June 13, 2023

1 Ajinomoto Group's Bio-Pharma Services (CDMO services)

Overview

2 Oligonucleotide Contract Manufacturing Service

3 ADC Drug Discovery Support and Manufacturing Service

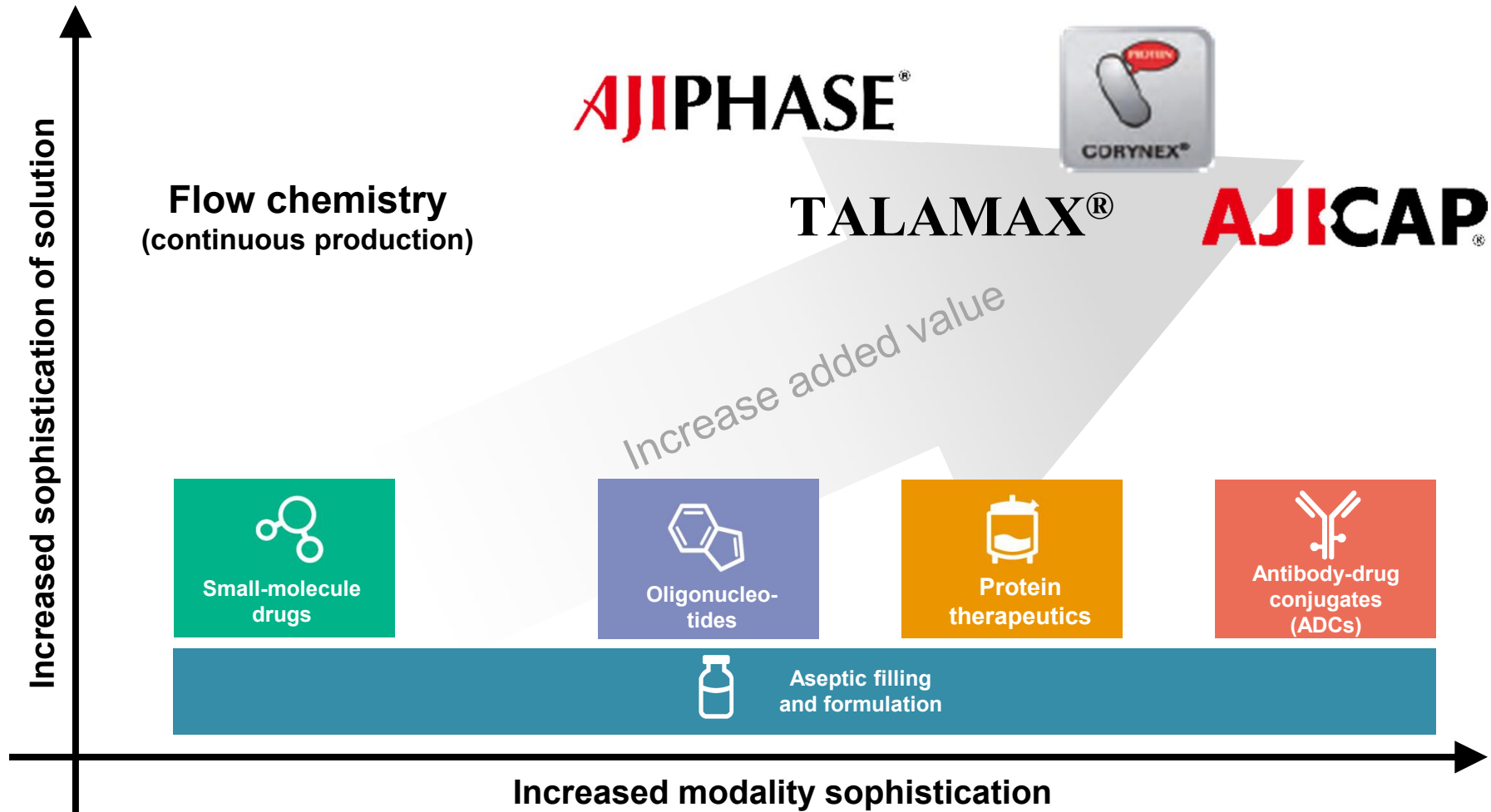
4 Other Initiatives

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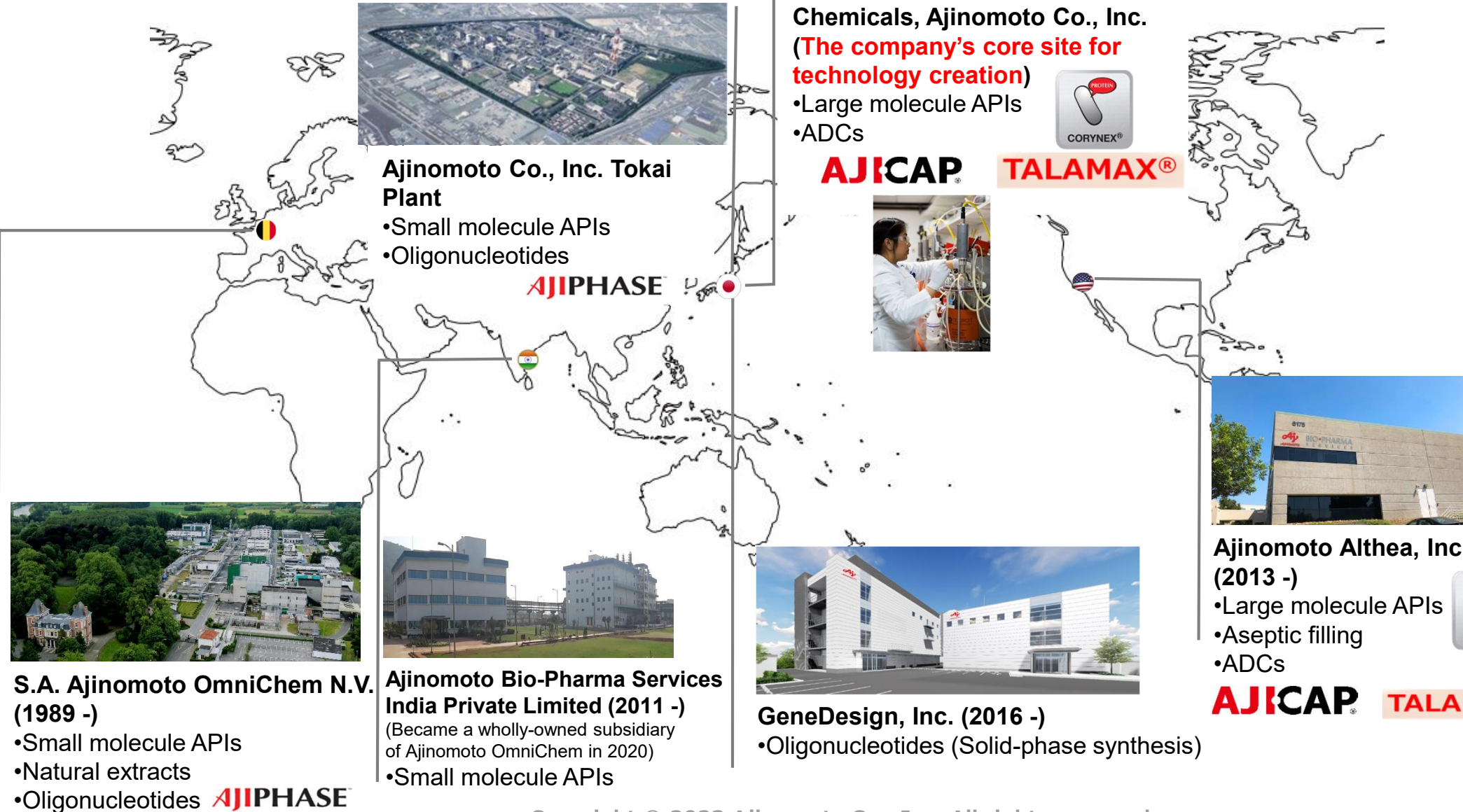
- 2 Oligonucleotide Contract Manufacturing Service
- 3 ADC Drug Discovery Support and Manufacturing Service
- 4 Other Initiatives

Increase the Added Value of the Ajinomoto Group's Bio-Pharma Services Business



Based on our one-stop service for contract manufacturing of small, medium, large molecules, aseptic filling and formulation, we will accelerate our contract business leveraging our unique technology to drive the increase of the business' added value.

Global Bases of the Bio-Pharma Services Business



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

- Large molecule APIs
- ADCs



AJICAP

TALAMAX



Ajinomoto Althea, Inc. (2013 -)

- Large molecule APIs
- Aseptic filling
- ADCs



AJICAP

TALAMAX



GeneDesign, Inc. (2016 -)

- Oligonucleotides (Solid-phase synthesis)



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

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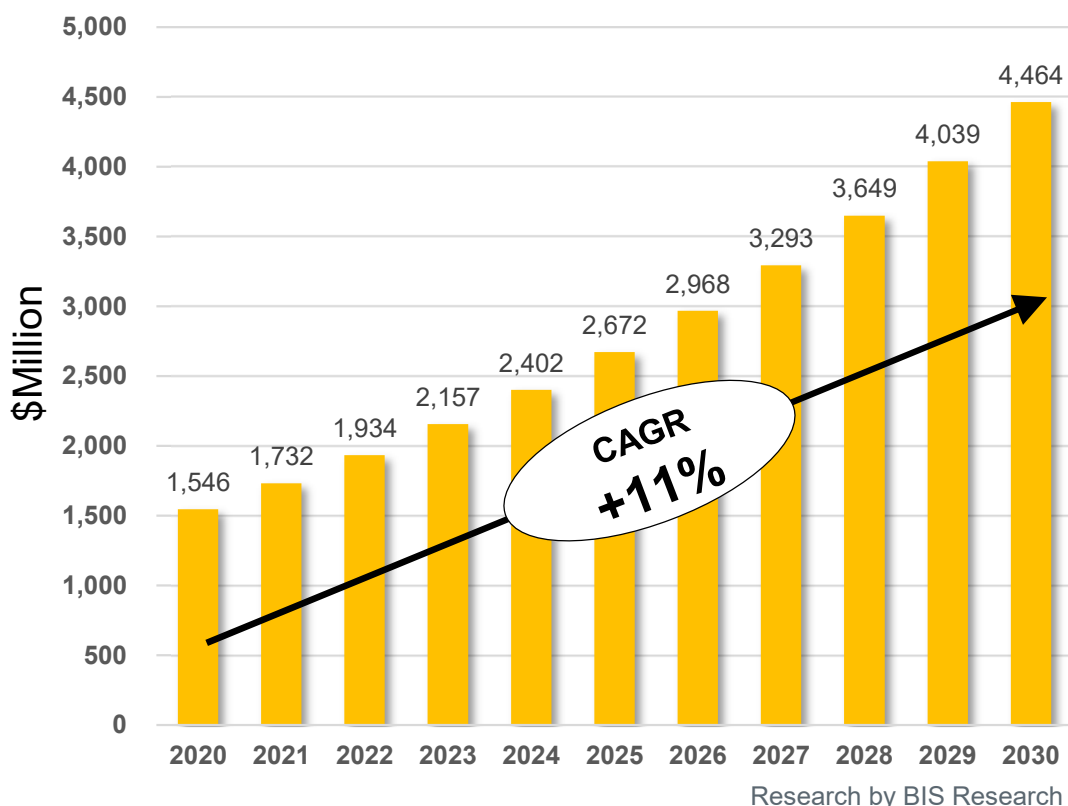
2 **Oligonucleotide Contract Manufacturing Service**

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Contract Manufacturing Market for Nucleic Acid-Based Drugs

In the growth stage as an industry, the CDMO market for nucleic acid-based drugs is expected to reach approximately ¥450 billion in 2030



There are several types of nucleic acid within the industry. Currently, the main area for Ajinomoto Group is oligonucleotides.

Nucleic acid type	Role
Oligonucleotides	Therapeutics
mRNA	Vaccines
Vectors	Gene therapy

Main players in oligonucleotide manufacturing (competition)

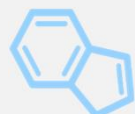
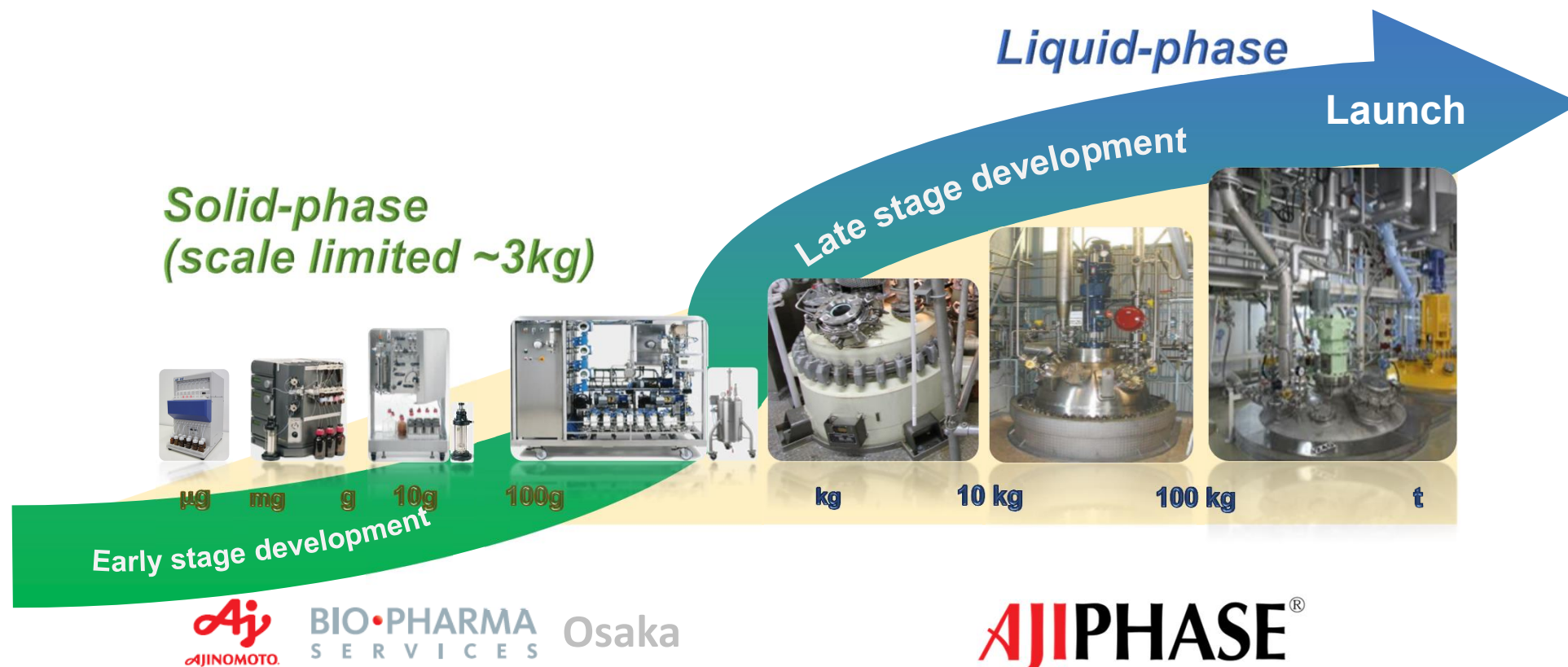
Nitto Avecia (U.S., solid-phase synthesis)
 Agilent (U.S., solid-phase synthesis)
 BioSpring (Germany, solid-phase synthesis)
 and others



- 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 competitiveness are unique strengths and differentiating factors**

Strengths of Our Oligonucleotide Contract Manufacturing Service



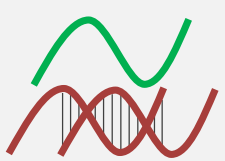
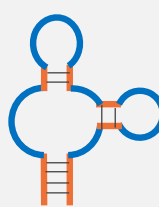
Only nucleotide CDMO using *AJIPHASE*[®], a proprietary liquid-phase manufacturing technology, in addition to solid-phase manufacturing technology

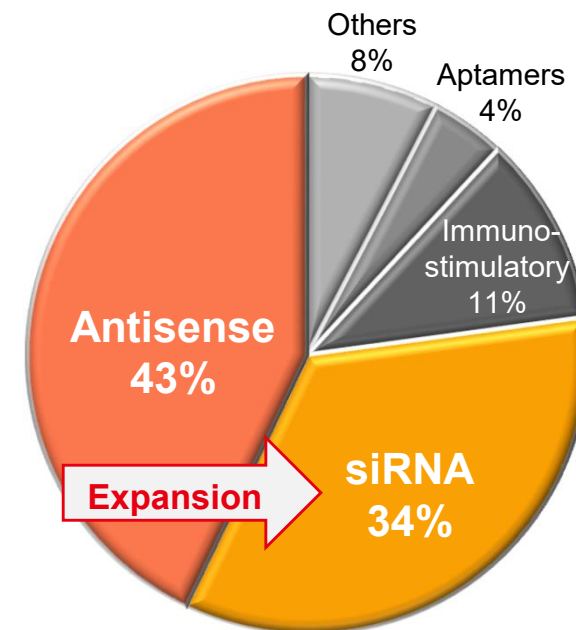


- Development stage and the timing and volume of required supply are not constants.
- Offer flexible use of solid-phase synthesis and *AJIPHASE*[®] technologies.

Our Oligonucleotide Contract Manufacturing Business Targets and New siRNA Manufacturing Method

Oligonucleotide categories

	Antisense	siRNA	Immuno-stimulatory	Aptamers
Structure	<p>Current main target</p>  <p>Single-stranded DNA/RNA</p>	<p>Target expansion</p>  <p>Double-stranded RNA</p>	 <p>Single-stranded DNA Double-stranded RNA</p>	 <p>Single-stranded DNA/RNA</p>
Base length	12-21 20-30	20-25	Around 20	26-45
Common application	Rare genetic diseases	Cancer, metabolic diseases	Vaccines (adjuvants)	Eye diseases
Prdcts. on market	9	6	—	1



2022 category percentages of oligonucleotides in clinical trials or approved (n = 210)

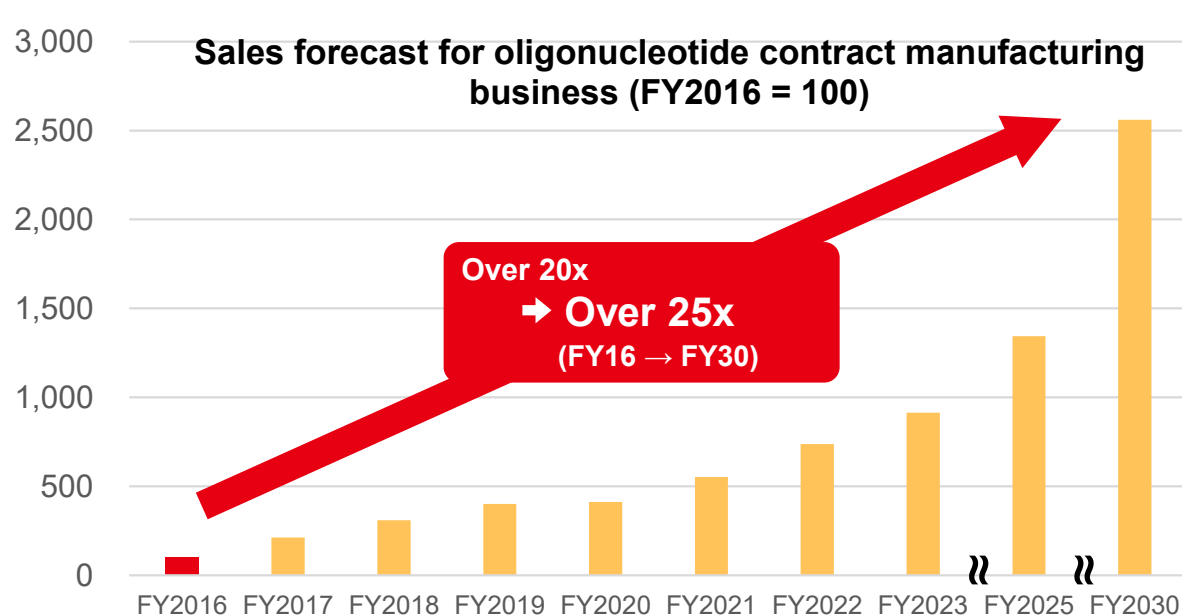
Source: Seed Planning



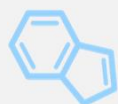
- Oligonucleotide contract manufacturing business targets: Expand from focus on **antisense** to also include **siRNA**
- Expand share via new technology: Establish **unique siRNA manufacturing method** using enzymes
- Make it possible to cover the majority of the clinical pipeline and also expand applicable diseases

Our Oligonucleotide Contract Manufacturing Business Sales Forecast

Our oligonucleotide contract manufacturing business is growing steadily. We have upwardly revised* the medium- to long-term sales forecast announced at the business briefing in August 2022.



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



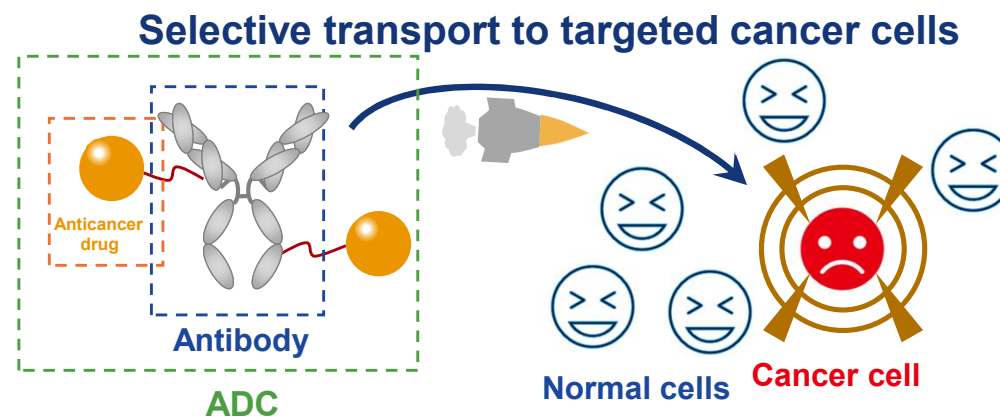
- Secure **manufacturing capacity six times greater** than FY2021 globally by FY2027 by **applying existing generic synthesis facilities**
- Expand market share through new technologies: **Unique manufacturing method** using enzymes
- Develop customers through a globally integrated system

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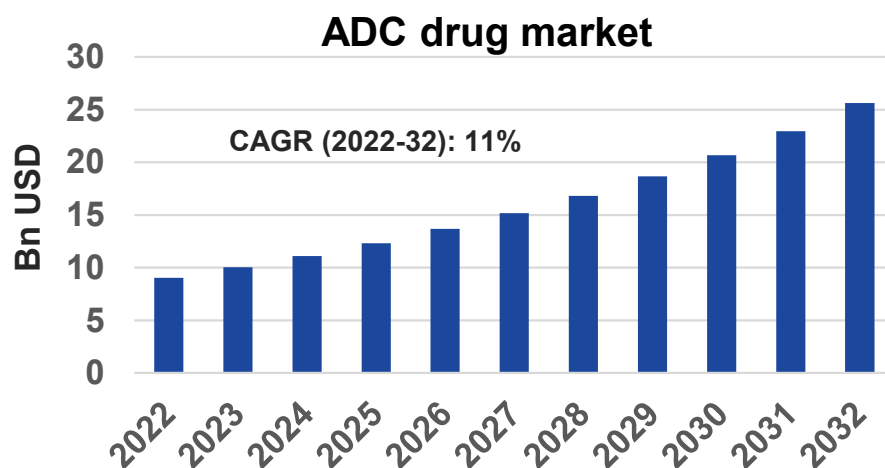
ADCs (Antibody Drug Conjugates)

ADCs are drugs which selectively deliver anticancer drugs only to cells requiring treatment

- Using the property of antibodies to link to specific cancer cells, ADCs **selectively** deliver anticancer drugs to cancer cells



The market for ADCs is expected to expand and the number of approved ADCs has risen sharply since 2017



Source: Precedence Research

No. of approved ADCs

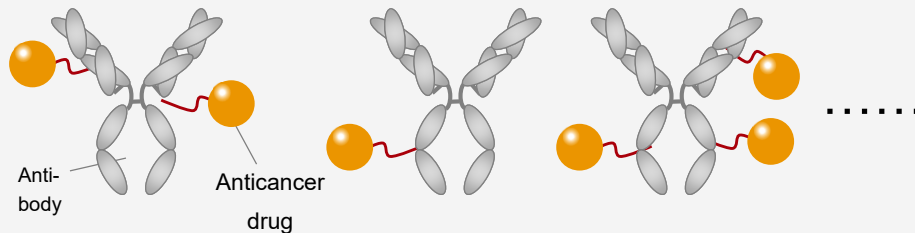
Year	No. approved
2011	1
2013	1
2017 onward	11

Source: Beacon by Hanson Wade

AJICAP is a breakthrough technology enabling easy creation of site-specific ADCs with **high efficacy and low toxicity**

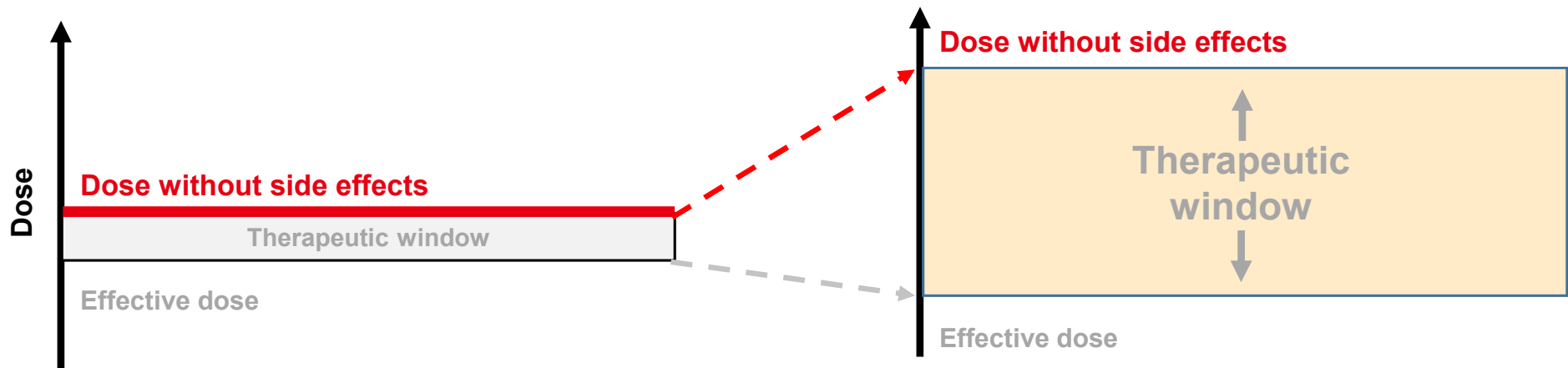
Conventional ADCs

Mixture: anticancer drug bound to different sites of the antibody, and in different amounts

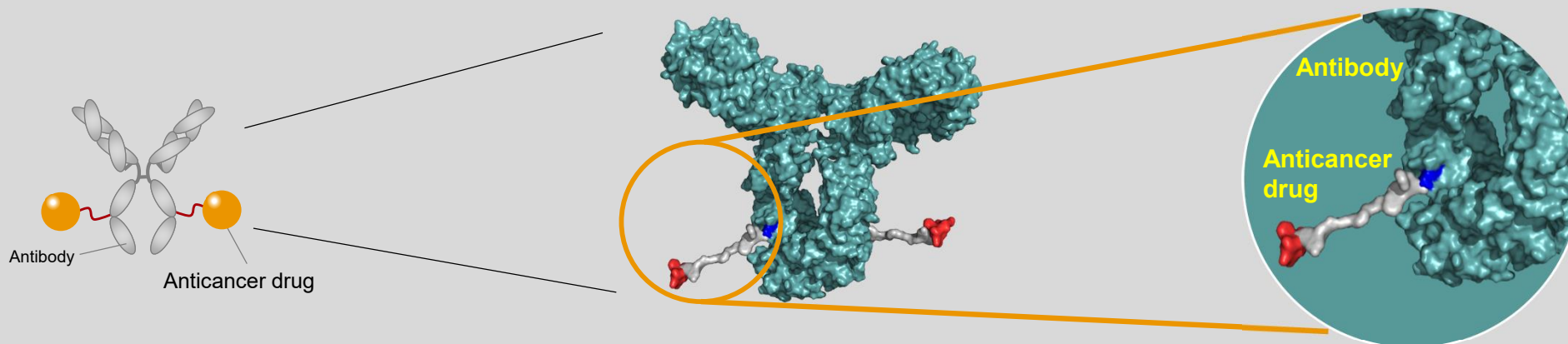


Site-specific ADCs

Uniform structure with anticancer drug bound to specific sites of the antibody



AJICAP[®] Technology Developed with Advanced Technology Cultivated through "AminoScience"



- Antibody has a complex structure of approx. 1,400 **amino acids** linked together
- Selective introduction of anticancer drugs at specific amino acids achieved through **advanced "AminoScience"** technology

Highly rated on the Nature Index*

- **Paper submitted on AJICAP[®]** in the field of chemistry in 2019 **highly rated**

*Nature Index: A ranking of the degree of contribution of papers submitted to leading journals by the international multidisciplinary science journal *Nature*. A highly trusted index, it is even reported on by the press.

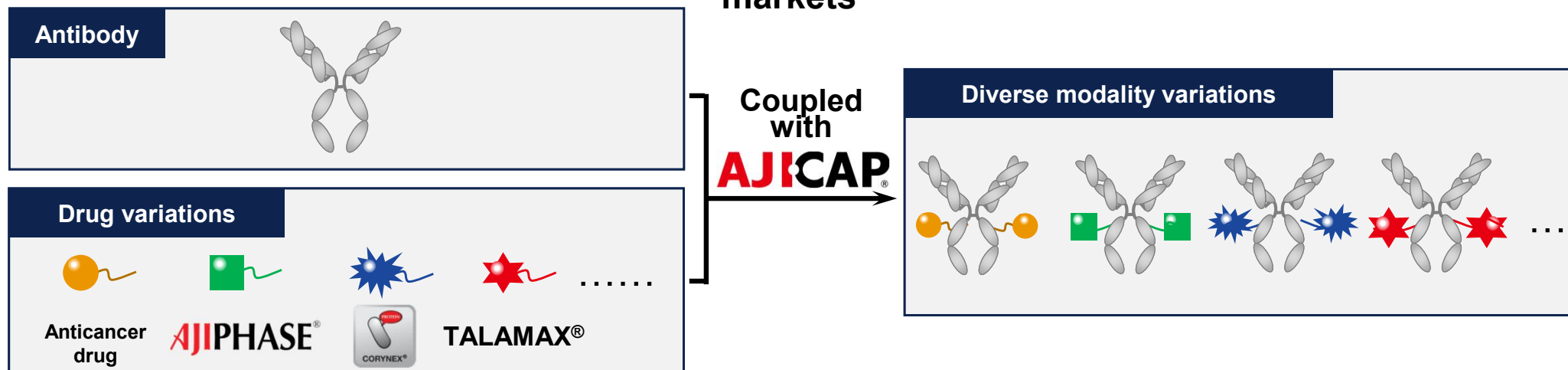
Academic conference awards

- **Selected for Best Pre-Clinical Publication from among over 900 candidates** at World ADC Digital 2020, the world's largest academic conference in the field of ADCs
- Given the Award of Excellence and the JMC Special Award at the 37th Medicinal Chemistry Symposium

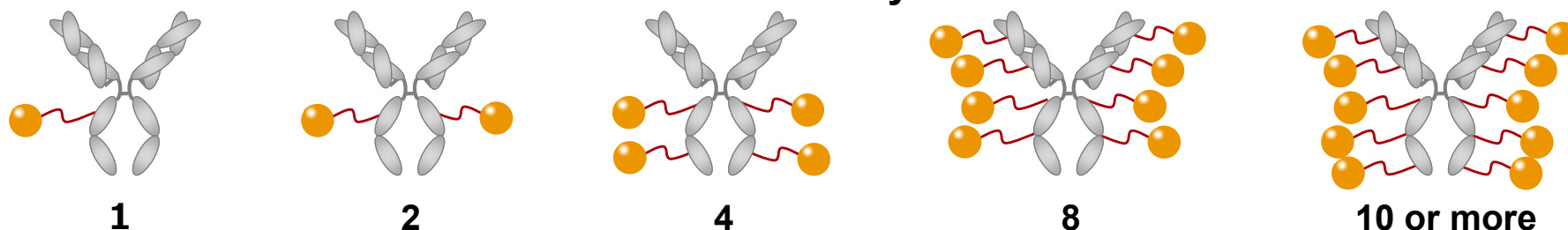
AJICAP[®] was developed with advanced "AminoScience" technology and is being highly evaluated globally

Extensive Applications for **AJICAP** Technology

Combining **AJICAP**® with Ajinomoto's unique technology makes it possible to apply not only to the ADCs used for anticancer drugs but also new modalities with expanding markets



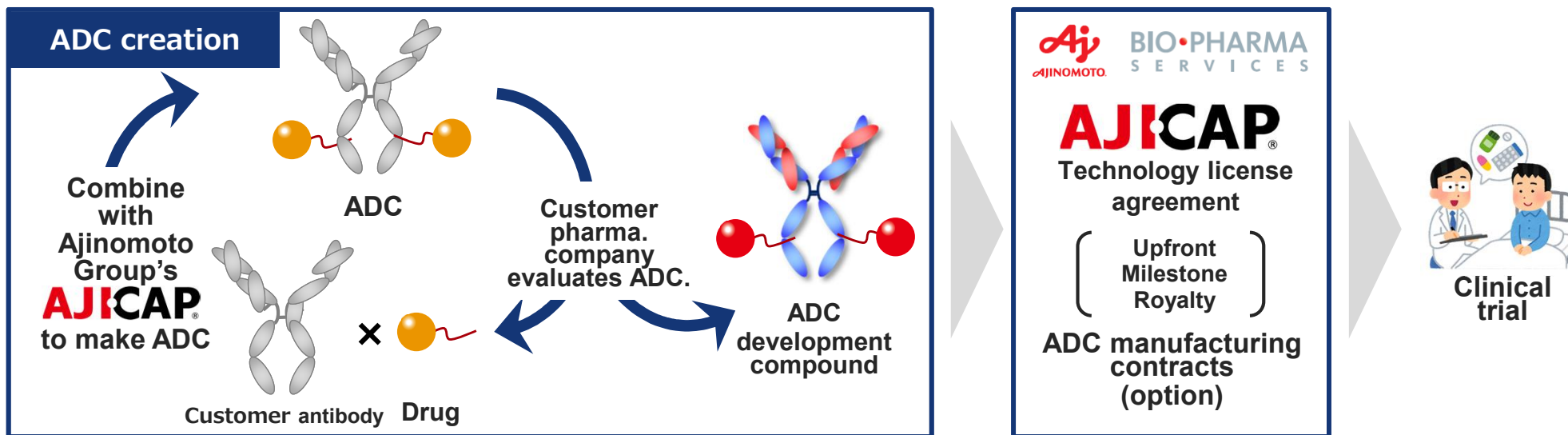
AJICAP® makes it possible to precisely control the number of drug molecules on the antibody



We will leverage the extensive applications of **AJICAP**® to develop an ADC drug discovery support and manufacturing service which flexibly meets the diverse needs of customers

ADC Drug Discovery Support and Manufacturing Service Business Model and Results

The ADC drug discovery support and manufacturing service employs an asset light business model centering on **AJICAP** technology licensing



Technology license agreements with multiple companies including 1) Bright Peak Therapeutics and 2) Exelixis

PRESS RELEASE Ajinomoto Co., Inc.
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Ajinomoto Co., Inc. and Bright Peak Therapeutics Inc. Enter into a Research Collaboration and License Agreement to Create Novel Immunocytokines

SAN DIEGO, March 25, 2021 and TOKYO March 26, 2021 – Ajinomoto Co., Inc. ("Ajinomoto Co."), a leading technology provider for biopharmaceuticals and the owner of Ajinomoto Bio-Pharma Services offering pharmaceutical contract development and manufacturing services, and Bright Peak Therapeutics Inc., a biotechnology company developing next generation immunotherapies for cancer and autoimmune disease, today announced a research collaboration and exclusive license agreement to incorporate AJICAP®, Ajinomoto Co.'s proprietary site-specific bioconjugation technology, for the development of Bright Peak Immunocytokines.

Ajinomoto and Exelixis Enter Into a License Agreement to Discover and Develop Novel Antibody-Drug Conjugates for the Treatment of Cancer

TOKYO January 10, 2023 – Ajinomoto Co., Inc. ("Ajinomoto Co.") today announced a license agreement with Exelixis, Inc. ("Exelixis") to incorporate AJICAP®, Ajinomoto Co.'s proprietary site-specific bioconjugation and linker technologies, in the development of certain of Exelixis' antibody-drug conjugate (ADC) programs.

Exelixis is a commercially successful, oncology-focused biotechnology company that strives to accelerate the discovery, development and commercialization of new medicines for difficult-to-treat cancers. Utilizing its network of biotherapeutics collaborations, the company is developing next generation ADCs for the treatment of various cancers. Ajinomoto Co. is a leading technology provider for biopharmaceuticals and the owner of CDMO Ajinomoto Bio-Pharma Services.

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Solutions Business that Contributes to Advanced Medical Care Modalities

Grow the Bio-Pharma business through Ajinomoto Group'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

AJIPHASE[®]

AJICAP[®]

 **TALAMAX[®]**

RNA fermentation production technology, etc.

Proprietary efficient manufacturing technology for oligonucleotides, which have an expanding market as a therapeutic agent for intractable diseases. Already successfully commercialized.


Breakthrough technology to control the number of drugs that bind to antibodies.

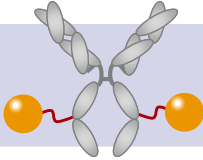
Attracting attention as a manufacturing technology for antibody-like proteins and antibodies without sugar chains.


mRNA is attracting attention for novel coronavirus vaccines.




Advanced medical care modalities

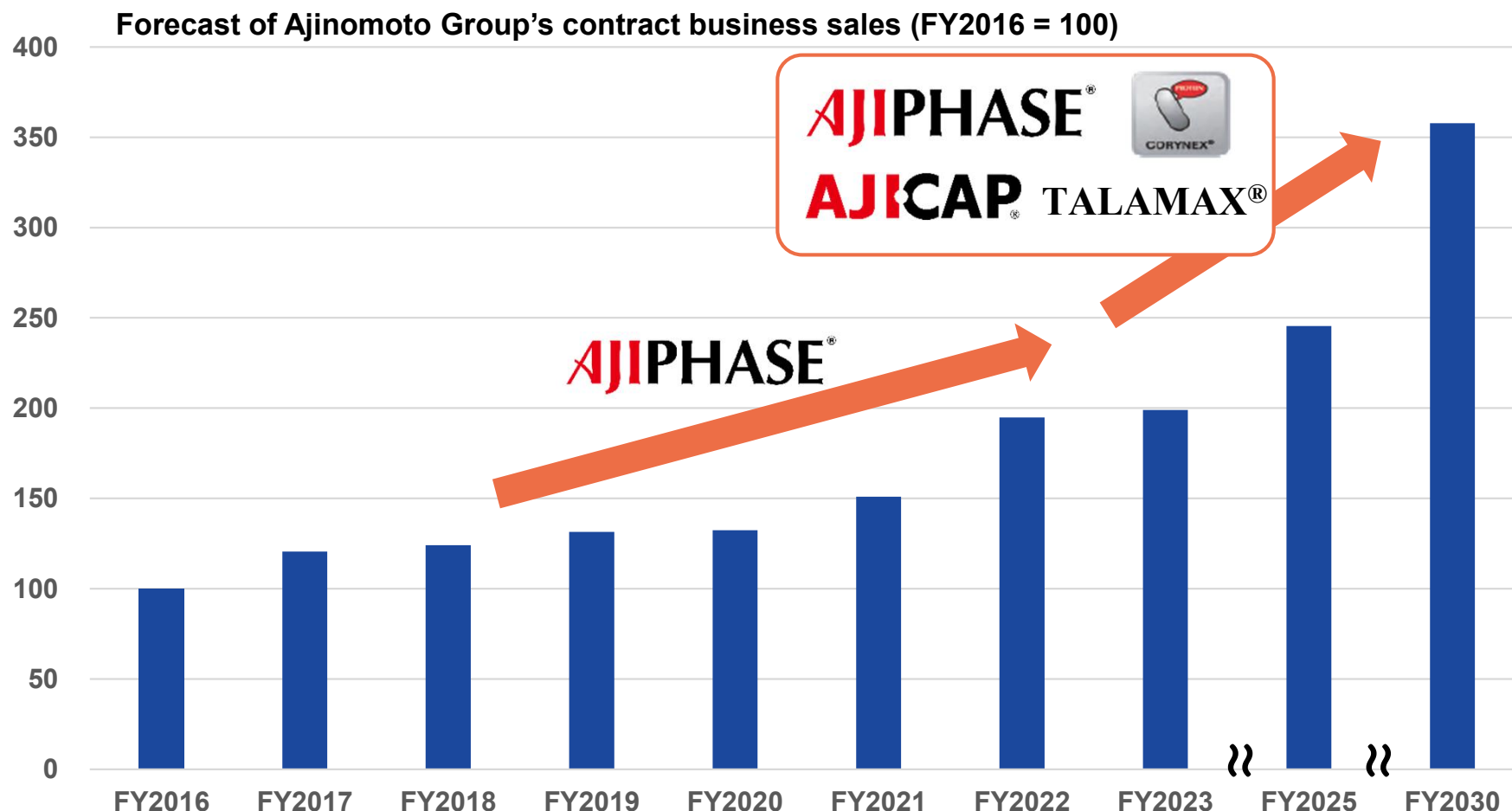
Oligonucleotides 

Antibody drug conjugates 

Proteins 

mRNA, gene therapy, etc. 

Expansion of the Bio-Pharma Services Business



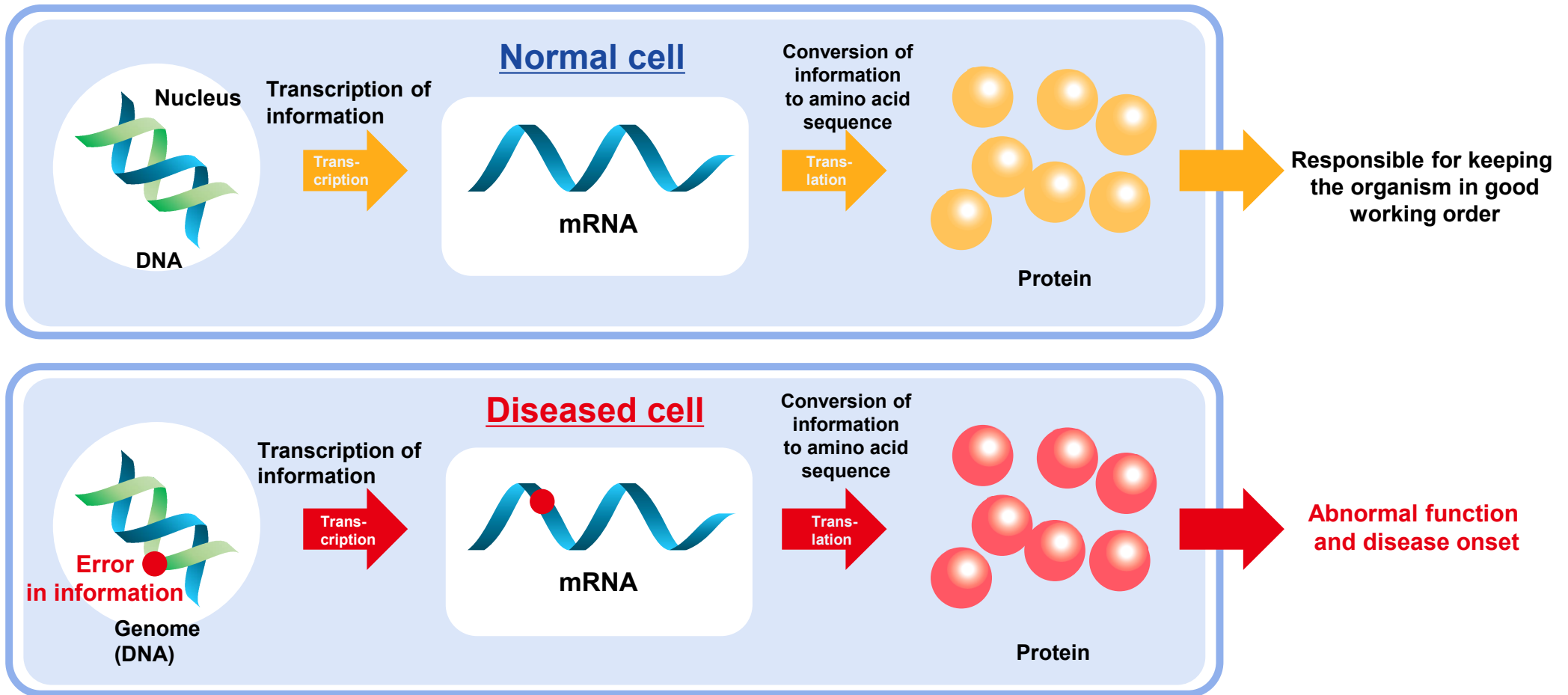
Contribute to further sales and profit growth by strengthening our proprietary technology, such as **AJIPHASE®** and **AJICAP®**, and solutions capabilities based on the technologies and customers cultivated through our drug contract manufacturing business.

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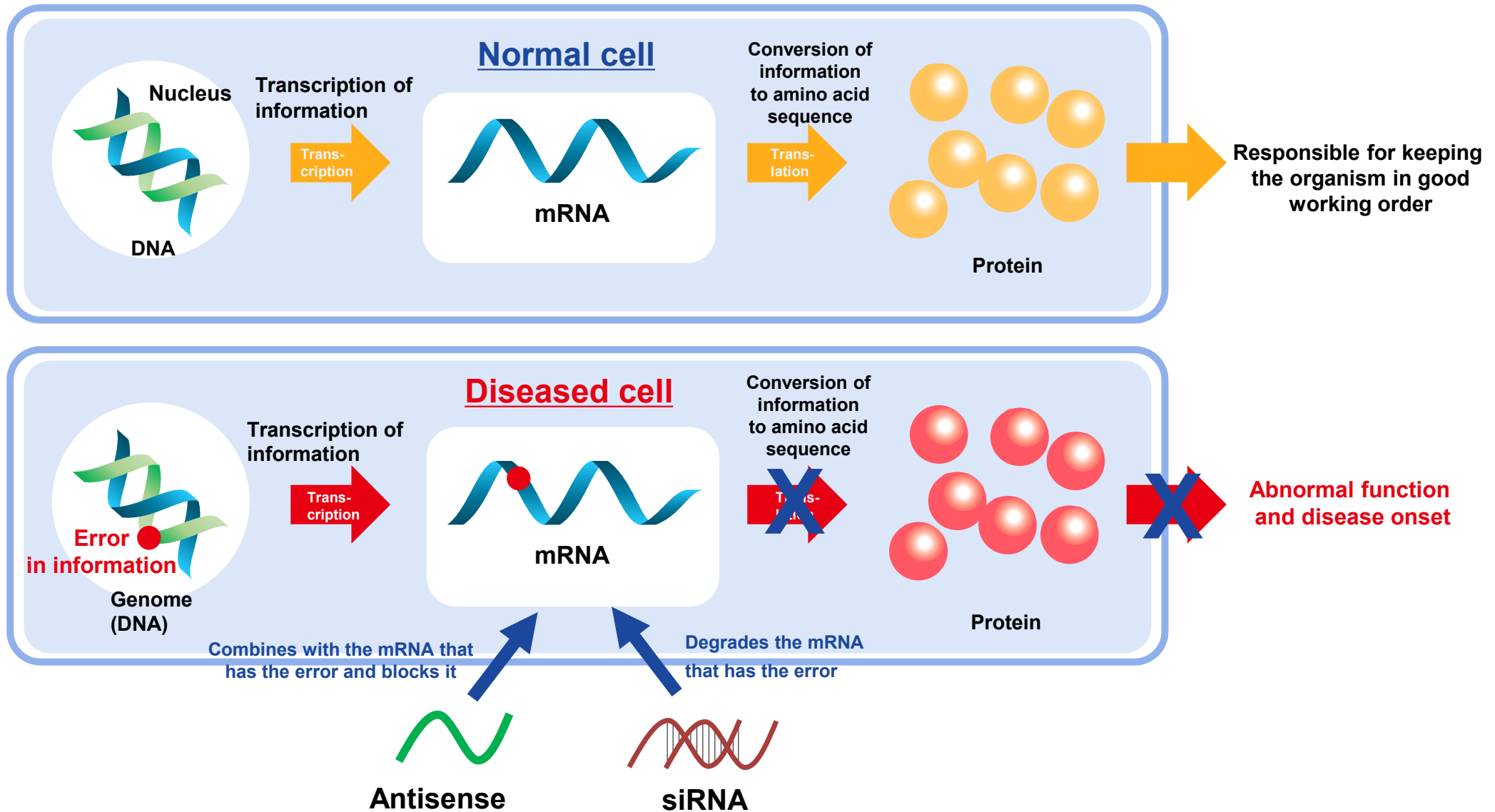


- **Forward-looking statements, such as business performance forecasts, made in these materials are based on management's estimates, assumptions and projections at the time of publication. A number of factors could cause actual results to differ materially from expectations.**
- **This material includes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

Appendix) Mechanism of Action of Antisense and siRNA



Appendix) Mechanism of Action of Antisense and siRNA



Antisense and siRNA provide a therapeutic effect by preventing the production of proteins with abnormalities.