

Small and medium-sized enterprises that strive with constant challenge and pioneering spirit

A company specializing
in the discovery of candidate
antibodies based on AI

Investor Relation 2023



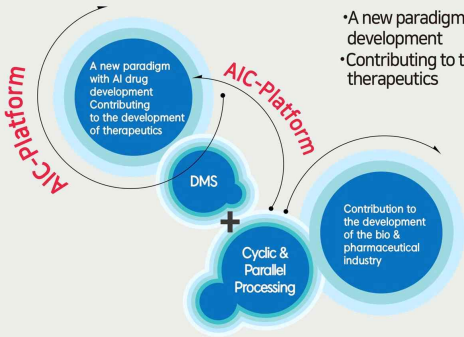
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1. Identity



1. Identity



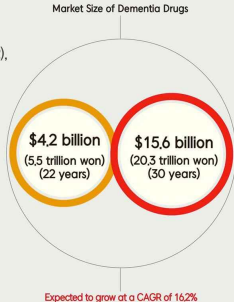
- A new paradigm with AI drug development
- Contributing to the development of therapeutics

2. Background

2. Background

2.2 Individual Therapy Market Size

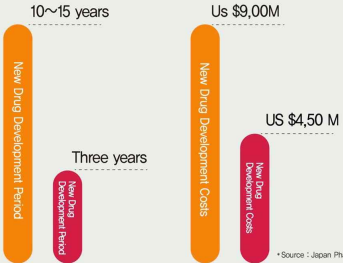
- Market Size of Dementia Drugs
 - Market size: \$4.2 billion (5.5 trillion won) in 2022),
Expected to reach \$15.6 billion
(20.3 trillion won) by 2030 \
 - Expected to grow by 16.5% annual
- Pancreatic Cancer Drug Market Size
 - Pancreatic cancer market size of \$2.2
billion (2.8 trillion won) / 21 years
Expected \$2.7 billion (3.5 trillion won)
by 2027





2. Background

▶ Effect of Artificial Intelligence Drug Development



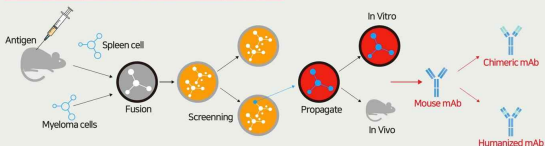
* Source : Japan Pharmaceutical Manufacturers Association(JPMA)

3. Solution

3. Solution

□ Traditional approach

Conventional Hybridoma method for Antibody Production



- Create hybridoma cells by fusing B lymphocytes, which produce specific antibodies, with cancer cells that undergo unlimited cell division, to mass-produce monoclonal antibodies.

Advantage

- Low cost & quick production time
- With low R&D costs, a well-known method.
- High specificity.

Disadvantages

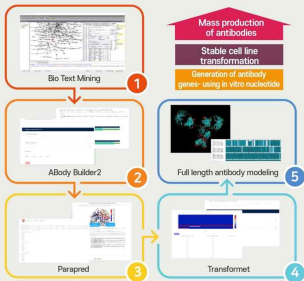
- Long processing time.
- Genetic arrangement causing non-functional constraint.
- Humanization of the Ab sequence is required.
 - Side effects.
- Human Anti-Mouse Antibody(HAMA)
- The clearance of mouse mAbs
- Producing undesirable allergic reactions
- tumor penetration

3. Solution

■ New Paradigm Discovery

K-3A (AI Aided Antibody) Design Platform(1/2)

Artificial Intelligence–Based Antibody Design



▸ Bio text mining (BTM)

Artificial intelligence–linked bio text mining–based disease search and target discovery technology. Enter genetic, drug, disease data to extract relationships of interest, Visualize and provide data related to drug discovery through correlation analysis

▸ AIC- Platforms(ABodyBuilder2, ParaPred)

- ABodyBuilder2: Enter heavy and light chain sequences of antibody to Modeling Antibody Fv regions based on Machine Learning
- ParaPred: For each amino acid in the CDR (including two adjacent additional residues), Derive the probability of contact

▸ AIC-GIN, Transformer

Antigen–antibody binding site sequence as input sequence information using transformer and Predict binding force (IC50) or binding status through graph information using GIN

▸ In silico based Lead optimization platform technology

- Mother antibody CDR extraction, validation
- Full length antibody modeling
- At the time of antibody model generation(human monoclonal antibody) template structure application

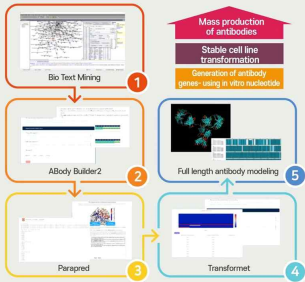


3. Solution

■ New Paradigm Discovery

K-3A (AI Aided Antibody) Design Platform(2/2)

Artificial Intelligence–Based Antibody Design



Advantage

- Accelerate the antibody design and optimization process. This reduces research and development time and enables faster drug development
- Use artificial intelligence to process and analyze large-scale biological data. This makes it possible to design antibodies taking into account various biological information and molecular interactions.
- Explore new antibody design possibilities that are difficult to design with traditional design methods

Disadvantages

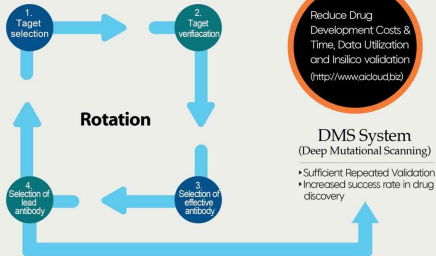
- AI-based antibody design relies on large datasets, which can limit the model's performance without sufficient data
- The model makes predictions and may not match the actual results, so additional experiments may be required
- Life science research using artificial intelligence is subject to ethical considerations and may raise issues related to bioethics and privacy.

The K-3A design platform enables increased cost efficiency in antibody research and development, provides excellent accuracy in predicting and analyzing complex biological interactions, reducing experimental trial and error, and enabling the design and optimization of antibodies that are difficult to detect with conventional methods.

3. Solution

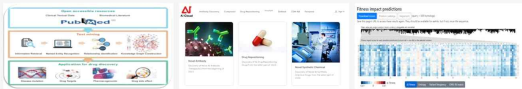
3.1 Overview of the platform(Cyclic & Parallel Processing)

Cyclic & Parallel Processing



3. Solution

3.2 How does the platform work? cyclic & Parallel Processing (1/3)



- Bio Text Mining : Thesis data screening system through individual name extraction
Identification of disease mechanisms and target selection /
Extraction of target protein sequence and structure information
- GIN, Transformer : Artificial Intelligence derived Antibody library Generation and
Binding strength validation
- Solubility, Half-life, Immunogenicity, Aggregation Characterization of antibodies



3. Solution

3.2 How does the platform work? cyclic & Parallel Processing (2/3)



Therapeutic Antibody Profiler(TAP)

- Consider 5 characteristics of antibody molecules that have made it to clinical trials

- CDR Length
- PSH (Patches of Surface Hydrophobicity)
- PPC (Patches of Positive Charge)
- PNC (Patches of Negative Charge)
- SFvCSP (Structural Fv Charge Symmetry Parameter)

+

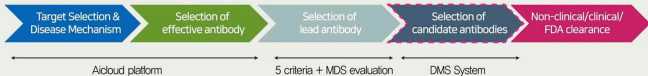
⟨Evaluation of Structural Stability and Free Energy⟩

- Molecular Dynamic Simulation

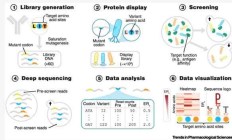
Parallel Simultaneous Evaluation

3. Solution

3.2 How does the platform work? cyclic & Parallel Processing (3/3)



- Selecting a location within the target for mutagenesis
- Creation of libraries through target site mutagenesis (3rd generation CRISPR technology)
- Mammalian expression system
- Screening for variant antibodies based on antigen specificity (FACS system)
- Library deep sequencing (NGS analysis)
- Enriched Amino Acid Substituent Function and Variant Codon Association (Bioinformatics)
- Generate Heatmap or Sequence logo with DMS analysis



3. Solution

3.3 Result (1/2)

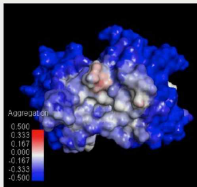
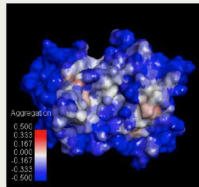
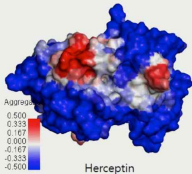
■ Results of a review of artificial intelligence antibody discovery against coronavirus variants

Aggregation of T4 vs T9

Molecular Aggregation Propensity Scores		
Protein	Score R=5	Score R=10
Herceptin_L1_Fabscap_01_0005_M30017	-0.333	-0.167

Molecular Aggregation Propensity Scores		
Protein	Score R=5	Score R=10
T4	-1.000	-0.612

Molecular Aggregation Propensity Scores		
Protein	Score R=5	Score R=10
T9	-1.750	-0.710



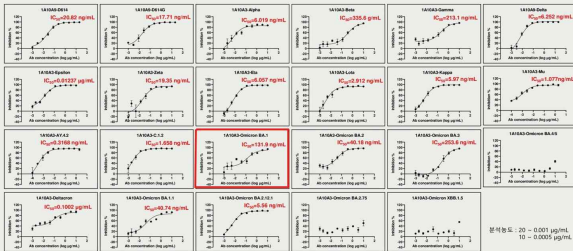
KBIO Artificial Intelligence Structural Design Team's in silico analysis results were calculated to have better physical properties than Herceptin, the comparison group.

3. Solution

3.3 Result (1/2)

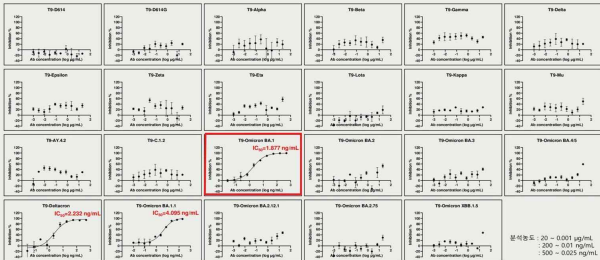
- Results of a review of artificial intelligence antibody discovery against coronavirus variants

Positive control (Anti-CoV-2 RBD antibody (1A10A3), YNTOAB (Cat # YA-00011))



3. Solution

3.3 Result (2/2)



July, 2023,

Completion of the second round of AI antibody discovery of coronavirus variants

Binding strength 70 times higher (IC₃₀=131.9 ng/mL/1,877 ng/mL) than positive control for research

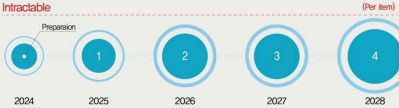
4. Strategy

4. Strategy

4.1 Business Model

□ AIC- Platform Service

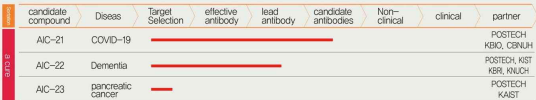
- Target : Pharmaceutical companies, medical corporations
- Field: Virus, incurable disease (dementia, pancreatic cancer)
- Finance : AI Voucher Project (Ministry of Science and ICT/NIPA)
- Features: 1 year shortest period, lowest cost new drug discovery service
- Service Objectives





4. Strategy

□ PIPELINE



4.2 Medium to Long-Term Business Plan

Sortation	2022	2023	2024	2025	2026	2027	2028	2029	2030
New drug development (antibody treatment development)	(Finding candidates for viral infectious diseases)			(preclinical)	(technology transfer)				
		(Search for Alzheimer's candidates)				(preclinical)	(technology transfer)		
			(Discovery of Δ Pancreatic Cancer Candidate)				(preclinical)	(technology transfer)	
Platform service	Registration	Marketing	2	3	4	6	8	10	10
project	1	1	2	3	3	4	4	5	5
Patent Registration	3	4	6	9	16	20	25	32	40
SCI paper	1	2	3	5	7	9	12	15	20
Human Resources (Research Personnel)	8(6)	10(7)	12(9)	15(12)	20(16)	40(32)	50(40)	80(68)	100(85)

* Source : Government-led Research and Development Projects: Biotech and Health (Ministry of Industry), Dementia Overcoming Development, Infectious Diseases (Ministry of Health and Welfare), and AI Drug Development (Ministry of Science and ICT)

5. Exit Plan



5. Exit Plan

□ Revenue

Unit: US\$100,000

Division	2023	2024	2025	2026	2027	2028	2029	2030	비고
Platform Service	-	6	9	12	18	24	30	30	
Viral Infectious Diseases	-	-	-	52	52	52	75	75	
Alzheimer's	-	-	-	-	-	141	141	141	
pancreatic cancer	-	-	-	-	-	-	-	35	
total	-	6	9	67	70	217	246	281	

* Source : Estimated amount of technology transfer : Estimated market size of 0.001~0.0001%, up to US\$ 0.225 million per platform service

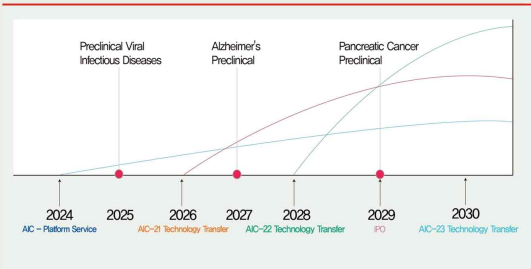
□ Technology Transfer Propulsion System

- Technology transfer of therapeutics for viral infectious diseases (2026)
- Alzheimer's Drug Technology Transfer(2028)
- Pancreatic cancer drug technology transfer (2030)



5. Exit Plan

■ Road map



* Source : Estimated amount of technology transfer; Estimated market size of 0,001~0,0007%, up to KRW 0,225 million per platform service

6. Company



6. Company

- ▶ Company : **AICLOUD Establishment** ▶ Date : 2015.01.26 ▶ CEO : Cho Doo-hyun
- ▶ Shareholders : **Cho Doo-hyun (100% shares)** ▶ Capital : 664,200,2
- ▶ Location : **66, Convergence Technology, Heunghae-eup, Buk-gu, Pohang-si, Gyeongsangbuk-do, Pohang Knowledge Industry Center 306**
- ▶ Main business short-term : **Derivation of diseases and targets for new drugs, discovery of therapeutics service business**
Medium and long-term : **Viral infectious diseases, pancreatic cancer, dementia treatment**
- ▶ Contact : Tel. 054-261-2751 / Mob. 010-8954-2103 / H.P : <http://www.aicloud.biz>

History

2015 Establishment of Innovation Marketing Co., Ltd, Ministry of Health and Welfare "Nanocomplex New Drug Development Pharmaceutical Industry Consulting Support Project"	2021~2024 Ministry of Trade, Industry and Energy Bio Industrial Technology Development (Digital Healthcare) 3,4 billion project cost "Antibodies, new compounds, and re-creation therapeutics BIT convergence AI technology Development, Validation and Candidate Discovery: The Case of Covid19"	2021,11 Venture Business Certification "Innovation Growth Type" Development of artificial intelligence-based antibody verification platform	2023,6 Antibody sequence discovery with binding specificity to Omicron BA,1 passed KBIO Insilico validation, Completed the 2nd drug efficacy verification
2016~2017 Small Business Administration Clinical Trial On-Off Line Convergence Platform Innobang Commercialization Support Project	2021,8 Relocated to Pohang	2022,7 Selected as a supplier of AI voucher support project	2023~ Dementia drug development project in progress



6. Company

Intellectual Property Rights (3 registrations/1 application/1 PCT)

- Disease association analysis method using data mining (ETRI)
(KR10-2016-0005560 Registration)
- Genome Analysis System (ETRI) (KR10-2017-0015826 Registration)
- Operation Method of Pathway Analysis System (ETRI) (KR10-2017-0166222 Registration)
- Infectious Disease Antibody Therapeutics Candidate Discovery Platform
(KR10-2022-0036646 application)
- Therapeutic Candidate Discovery System and Method (PCT Patent OPP20221986KR
Examination Requested)
- Structure-based Corona Leading Antibody Discovery System (Patent Pending)

Others (Certification, Registration)

- Recognized as a company-affiliated research institute (Korea Industrial Technology Association, 2021.3.25)
- Venture Business Confirmation (Korea Venture Business Association, 2021.11.10)
- Small and Medium Business Confirmation (Minister of SMEs and Startups, 2023.4.4.)
- Registered as an AI voucher supplier (National IT Industry Promotion Agency, 2022.12.20.)



A world free from disease!

"AiCloud" will not stop until the end for a
bright and healthy future for mankind.