



Advanced
Protein
Technologies
Corp.

HMOs (2'-Fucosyllactose)

Cell
Factory
For
Human

Introduction

1. Vision

"Cell factory for human"

Redesign of microorganisms

+

High cell density culture

+

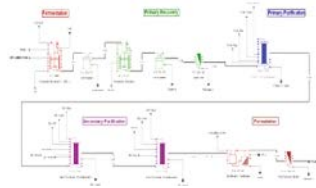
High efficiency purification

+

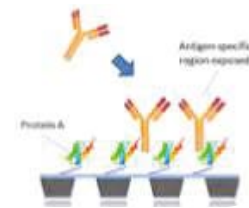
Commercialization technology



Human milk oligosaccharides

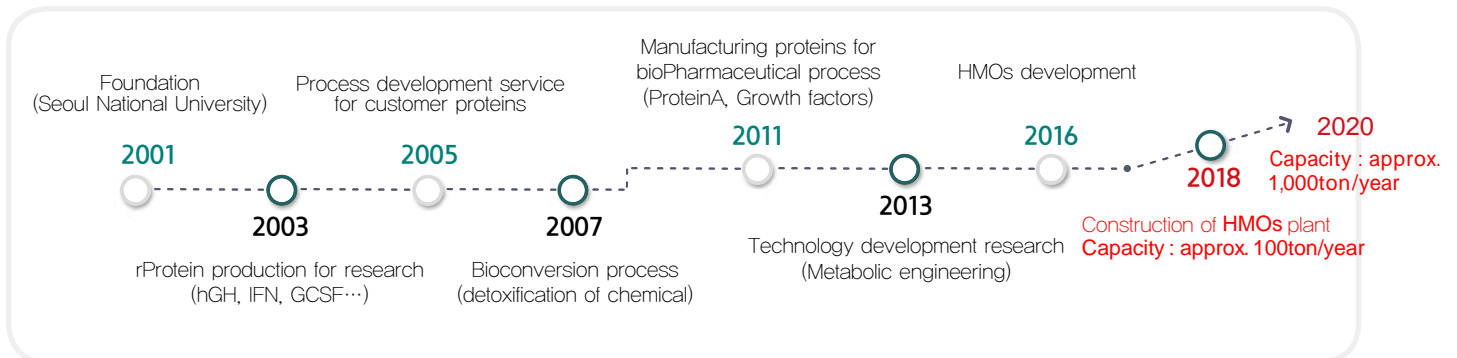


Process development



Recombinant Proteins

2. History



3. Products and services

- HMOs (Human Milk Oligosaccharides) : 2'-Fucosyllactose (2'-FL), 3-Fucosyllactose (3-FL)
- Proteins : ProteinA/G/L, Collagenase H/G, EGF, IGF
- Process development for recombinant protein (Customized)

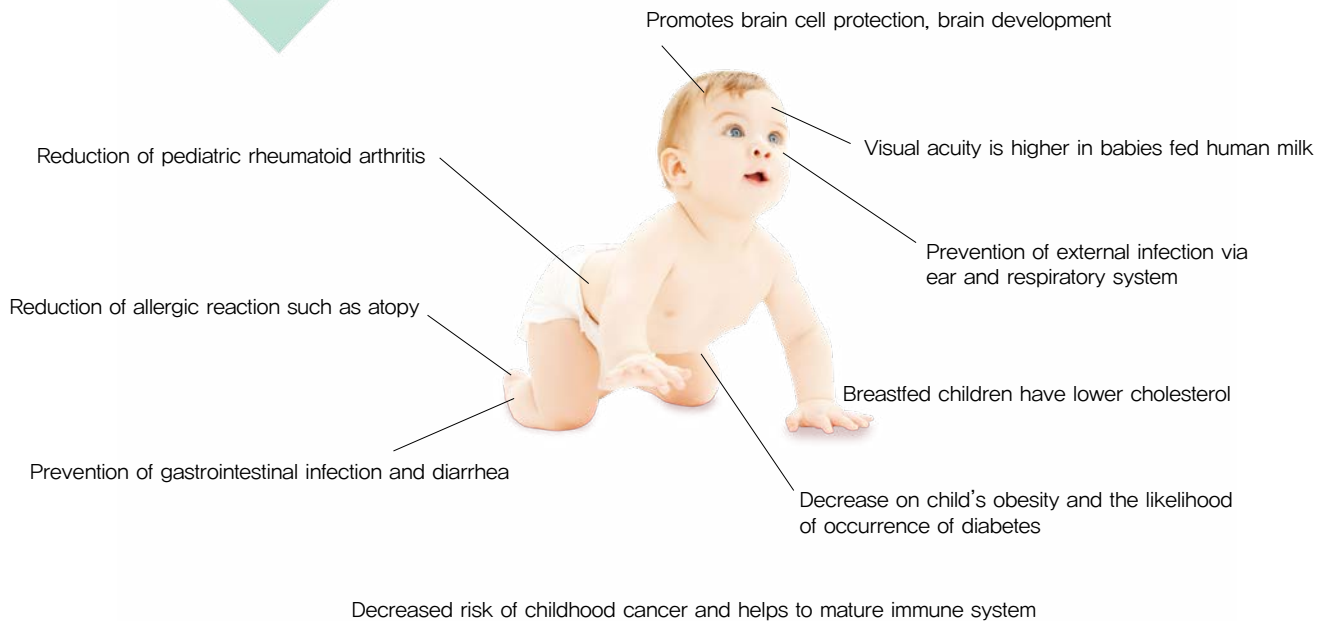


4. Human Milk Oligosaccharides (HMOs)

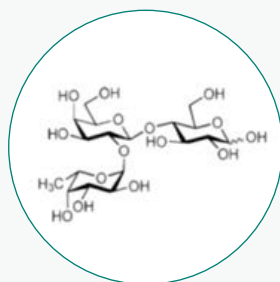
- Benefits of breastfeeding

Human Milk	Component (g/L)	Bovine Milk
8	Protein	32
41	Fat	37
70	Lactose	48
10	Oligosaccharides	0.05
(5~8)	2'-FL	(<0.001)

WHO strongly recommends breastfeeding for more than 6 months



- 2'-Fucosyllactose (2'-FL) is major component of HMOs



- Develop beneficial gut microbium
- Lower inflammatory cytokines
- Lower virus infection (animal tests)
- Alleviate food allergy (animal tests)
- Increase learning capabilities (animal tests)

Success Strategy

1. Strength of our 2'-FL project



Experience & Know-how
(fermentation & downstream processing)

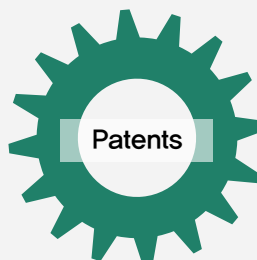


Year	Capacity(est.)
2019	100 ton / year
2020	1,000 ton / year

Strong Scientific Advisory Committee
(8 groups : domestic & international)



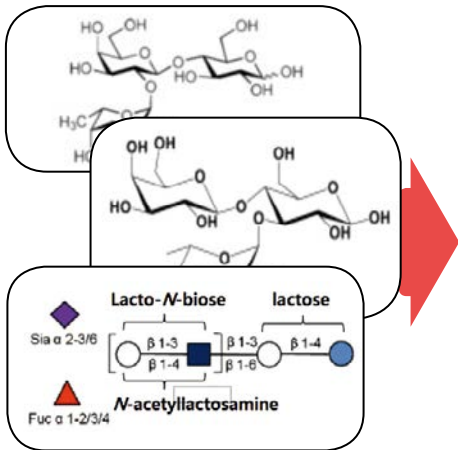
Strong Global IP Plan
(8 patents & 5 trademarks)



Core Technology

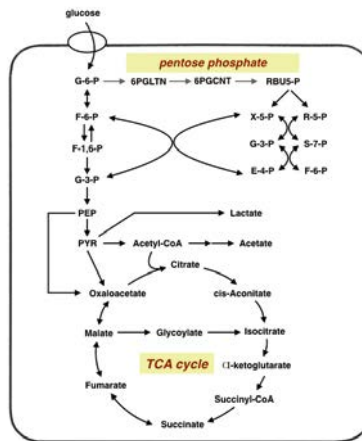
1. Technology for Production of Oligosaccharide

Selection of target materials



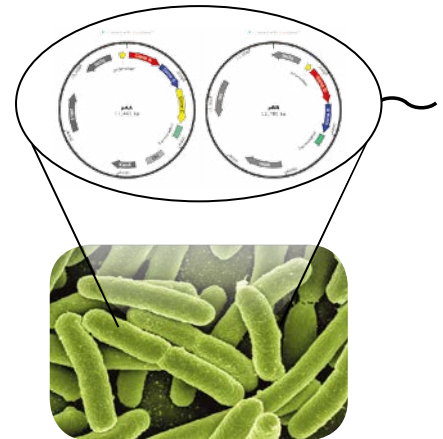
HMOs (2'-FL, 3'-FL...)

Strain development



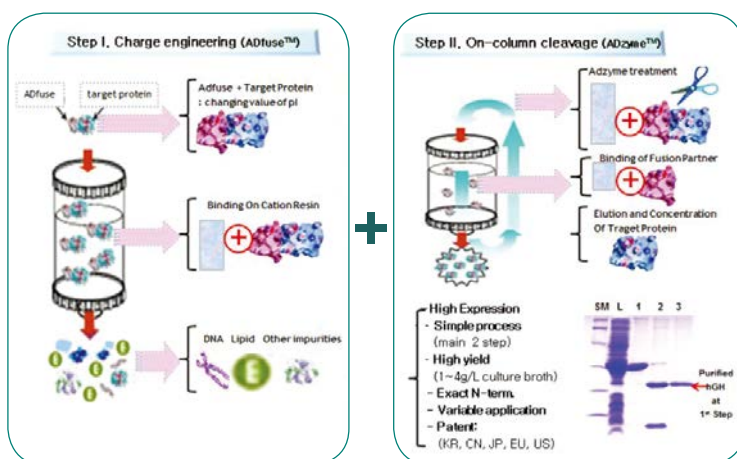
Metabolic engineering

Process development



Fermentation & purification

2. Technology for Process Development of rProtein (AD-Pure System™)



Comparison for Technology

	Existing technology	Our technology
Number of steps	Complicated process (over 10 steps)	Simplified process (5 steps)
Yield (hGH)	< 200mg/l broth	> 1.5g/l broth

AD-Pure system™ with high yield and purity ADzyme™ exactly cut off the fusion partner from the target protein

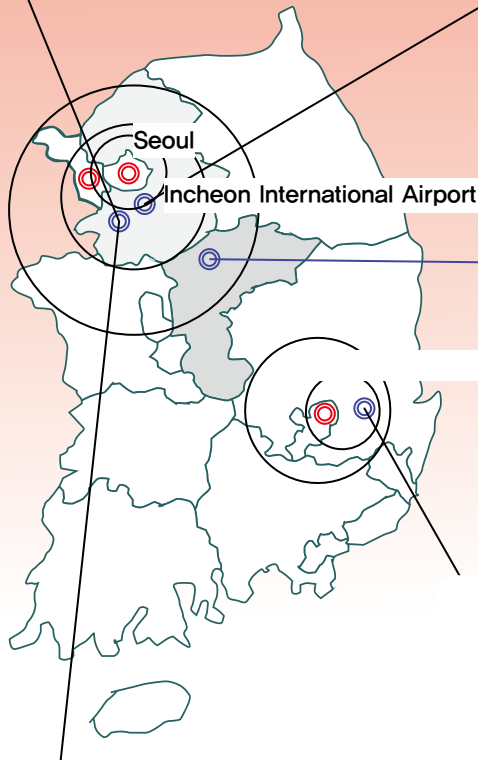


R&D Center

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HMOs Plant

- 2nd-FL, 3rd-FL plan to construct in Chungnam Province in 2020
- Capacity : approx. 1,000ton/year (estimates)

Bioconversion Plant

- Production of material for bioconversion by microorganism
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