



## Views on Korea's biotech landscape

EU Trade Counsellors meeting  
Dr. D S Kim, Sartorius Korea Biotech

July 6, 2023

# SARTORIUS

Pacesetter for More Than  
150 Years



Partner of biopharmaceutical research and industry



Sartorius Campus | Goettingen, Germany



# Sartorius in Brief



**60+**

Locations worldwide,  
headquartered in Göttingen, Germany



**~16,000**

Employees<sup>1</sup>



**~€4.175bn**

Sales revenue<sup>2</sup>



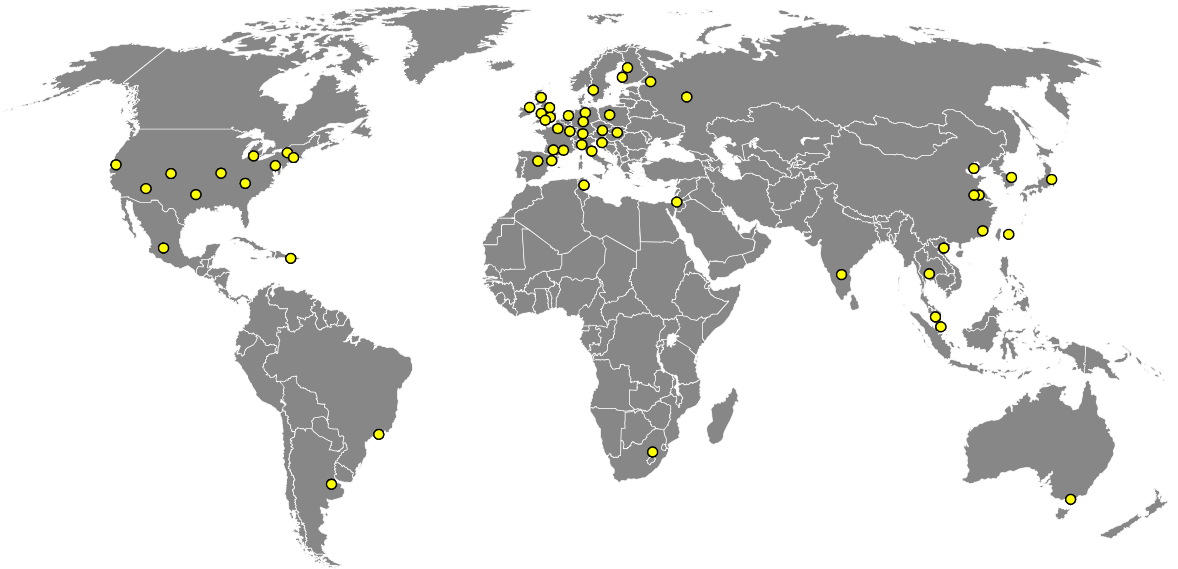
**33.8%**

EBITDA margin<sup>2,3</sup>



**~€24.1bn**

Sartorius AG market capitalization<sup>1</sup>;  
listed on the DAX and TecDAX



**~37%**  
Sales revenue  
Americas

**~37%**  
Sales revenue  
EMEA

**~26%**  
Sales revenue  
Asia | Pacific

1 As of December 31, 2022, 2 FY 2022, 3 Underlying EBITDA

# Customers

## GLOBAL



## LOCAL



# Korea won the 1st ranking of innovation

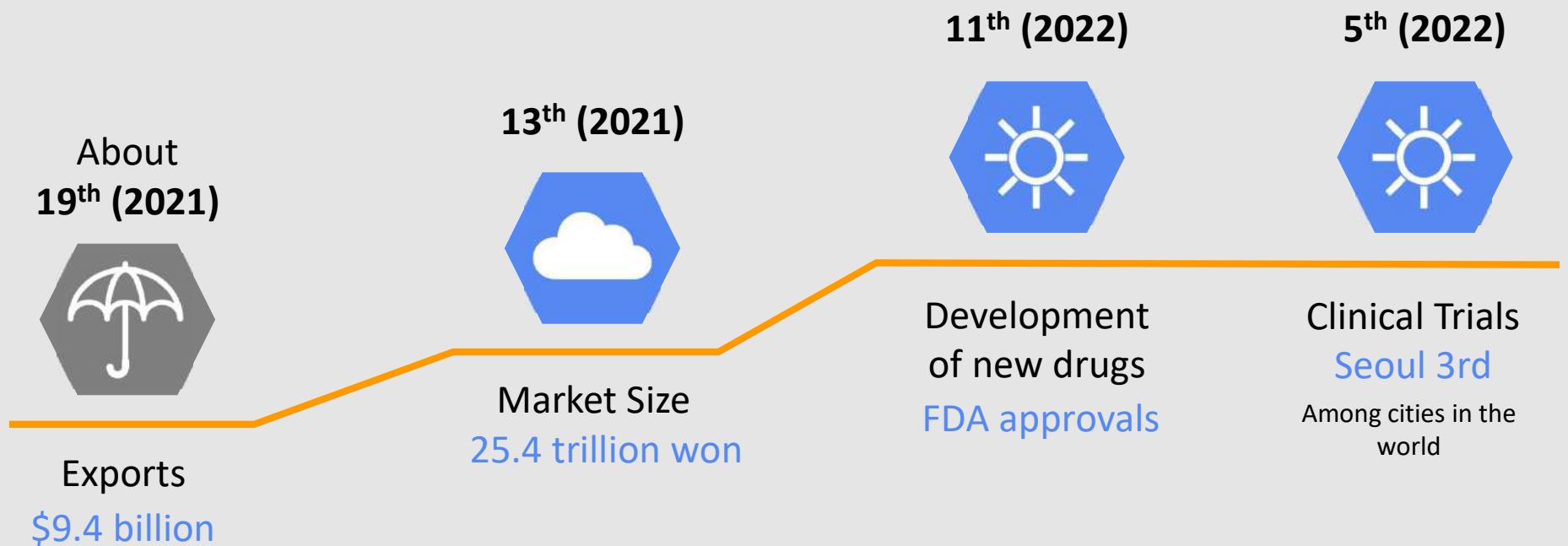
**BLOOMBERG**



## *Bloomberg Innovation Index (2021)*

2021 Rank	2020 Rank	YoY Change	Economy	Total Score
<b>1</b>	<b>2</b>	<b>+1</b>	<b>S. Korea</b>	<b>90.49</b>
2	3	+1	Singapore	87.76
3	4	+1	Switzerland	87.60
4	1	-3	Germany	86.45
5	5	0	Sweden	86.39
6	8	+2	Denmark	86.12
7	6	-1	Israel	85.50
8	7	-1	Finland	84.86
9	13	+4	Netherlands	84.29
10	11	+1	Austria	83.93
11	9	-2	U.S.	83.59
12	12	0	Japan	82.86

# Current Status of K-Pharma



Source: Statista.com, Korea Biomedical Review, Ministry of Health and Welfare, Oec.world.com, Informa.com 2023

# BioPharma Industry Size

<i>Rank</i>	<i>Country</i>	<i>R&amp;D Spending (PPP)</i>	<i>Global Share</i>
	All Other Countries	\$249.8 B	13.9%
1	United States	\$476.5 B	26.4%
2	China	\$370.6 B	20.6%
3	Japan	\$170.5 B	9.5%
4	Germany	\$109.8 B	6.1%
<b>5</b>	<b>South Korea</b>	<b>\$73.2 B</b>	<b>4.1%</b>
6	France	\$60.8 B	3.4%
7	India	\$48.1 B	2.7%
8	United Kingdom	\$44.2 B	2.5%
9	Brazil	\$42.1 B	2.3%
10	Russia	\$39.8 B	2.2%

<i>Rank</i>	<i>Country</i>	<i>As a % of GDP</i>
<b>1</b>	<b>South Korea</b>	<b>4.3%</b>
2	Israel	4.2%
3	Japan	3.4%
4	Switzerland	3.2%
5	Finland	3.2%
6	Austria	3.1%
7	Sweden	3.1%
8	Denmark	2.9%
9	Germany	2.9%
10	United States	2.7%

Source : howmuch.net, 17 July 2018



# Market Trends

## Growing fields in Korea's Bio Industry



Pharmaceutical

### PHARMA Production Scale('21)

- Pharmaceutical production scale reached **\$22.3B, 5.8% CAGR** over the past 5 years

### Achieved Annual Sales of \$1B

- Celltrion, Yuhan Corp, Samsung BIO, etc. achieved **\$1B sales**
- Investment expanded in **Biopharmaceuticals**



Medical Device

### Medical Device Market Size('21)

- Medical device production scale reached **\$11.3B, 22% CAGR** over the past 5 years

### Growth of SMEs & Diagnostic Kit Company

- Top 10 companies** account for **44%** of the total market
- Prominent in **COVID-19 testing kit** and **implants**



Healthcare Services

### Healthcare Services Sales('21)

- Healthcare sales reached **\$1.6B, 0.89%** of the global market

### Expansion of Investment in Startup

- Healthcare Startups started to **attract investment in earnest**

Source: Ministry of Trade, Industry and Energy

# R&D Investment

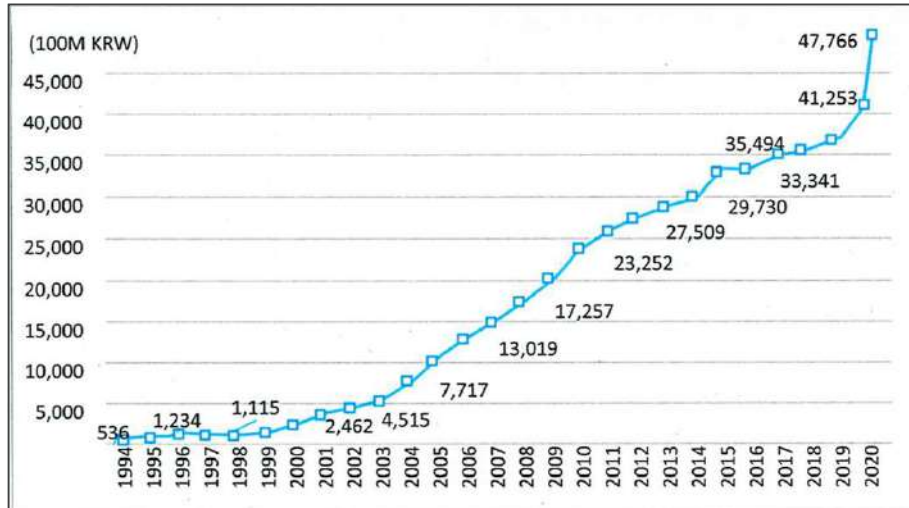
## Government's continuous R&D investment for Biotech

**\$2,681M** in BT support in 2016

**\$4,173M** in BT support in 2021 (+56% Growth)

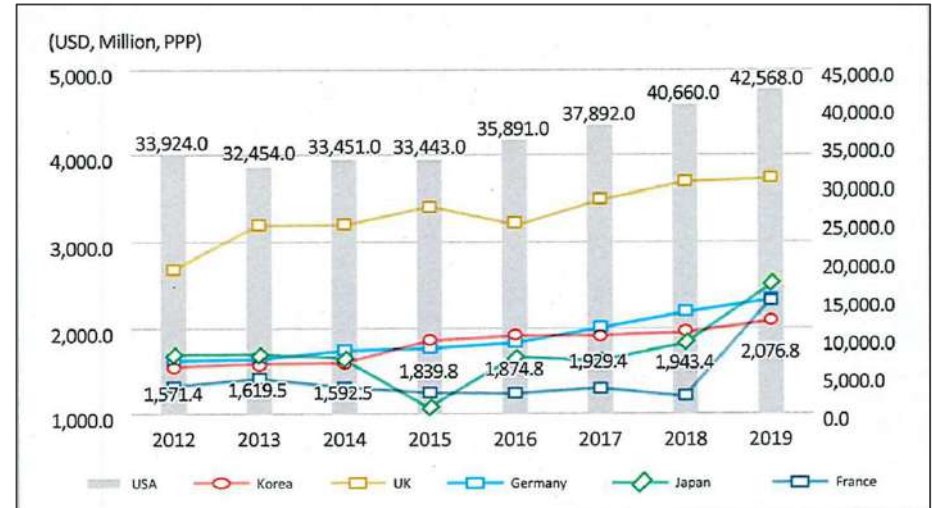
### Step 01

Government R&D investment in BT by Korea



### Step 02

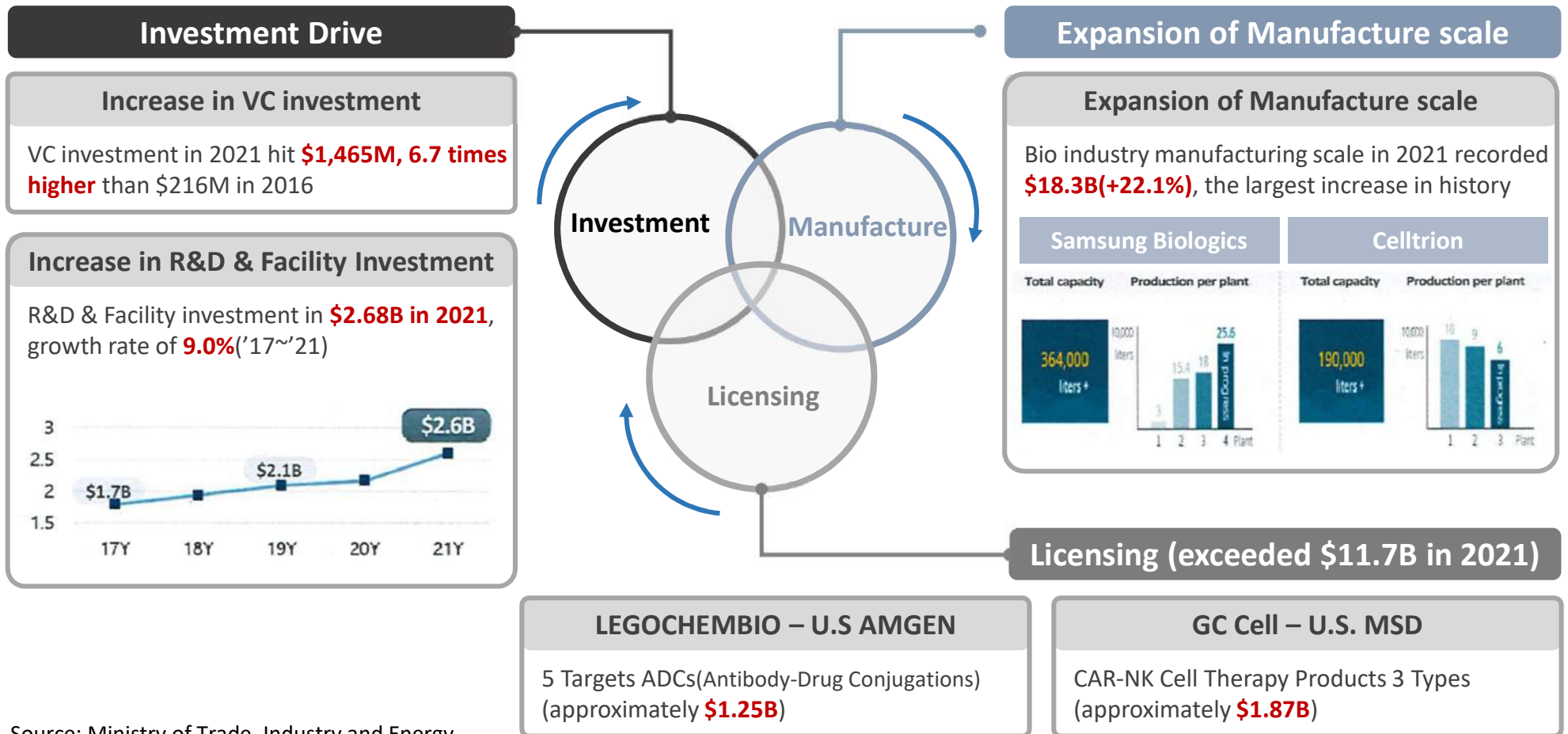
Government R&D investment in BT(health) by OECD countries



Source: Ministry of Trade, Industry and Energy

# Industry Performance

## Spread of performance as government investment expands



Source: Ministry of Trade, Industry and Energy

## Market Capitalization Top 4 Finance & Top 3 ICT sector in Korea

*As of June 30, 2023*

Samsung Biologics **52.9 Tril. KRW**

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Celltrion **22.4 Tril. KRW**

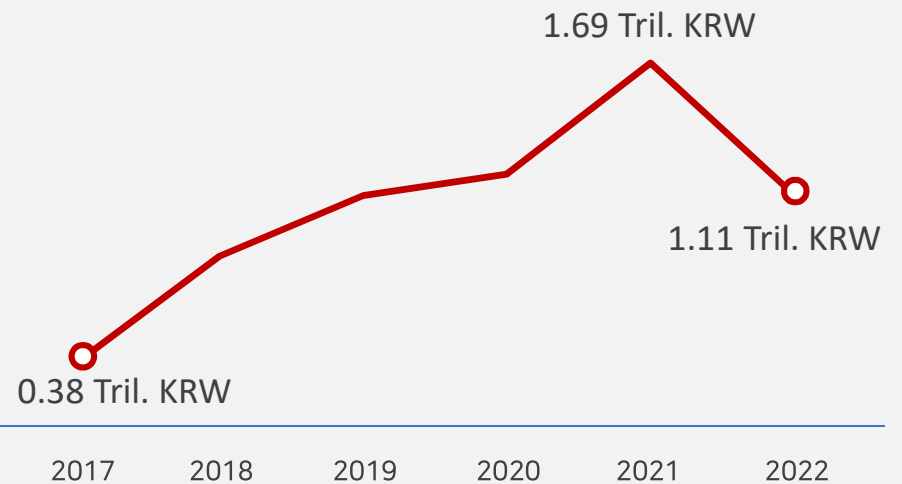
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Top 4 Finance **57.7 Tril. KRW**  
KB FG • Shinhan FG • Hana FG • Woori FG

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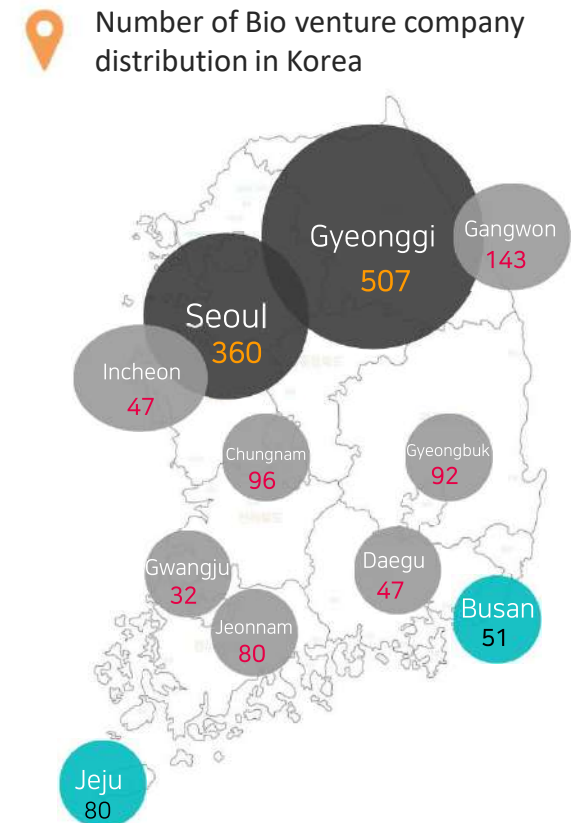
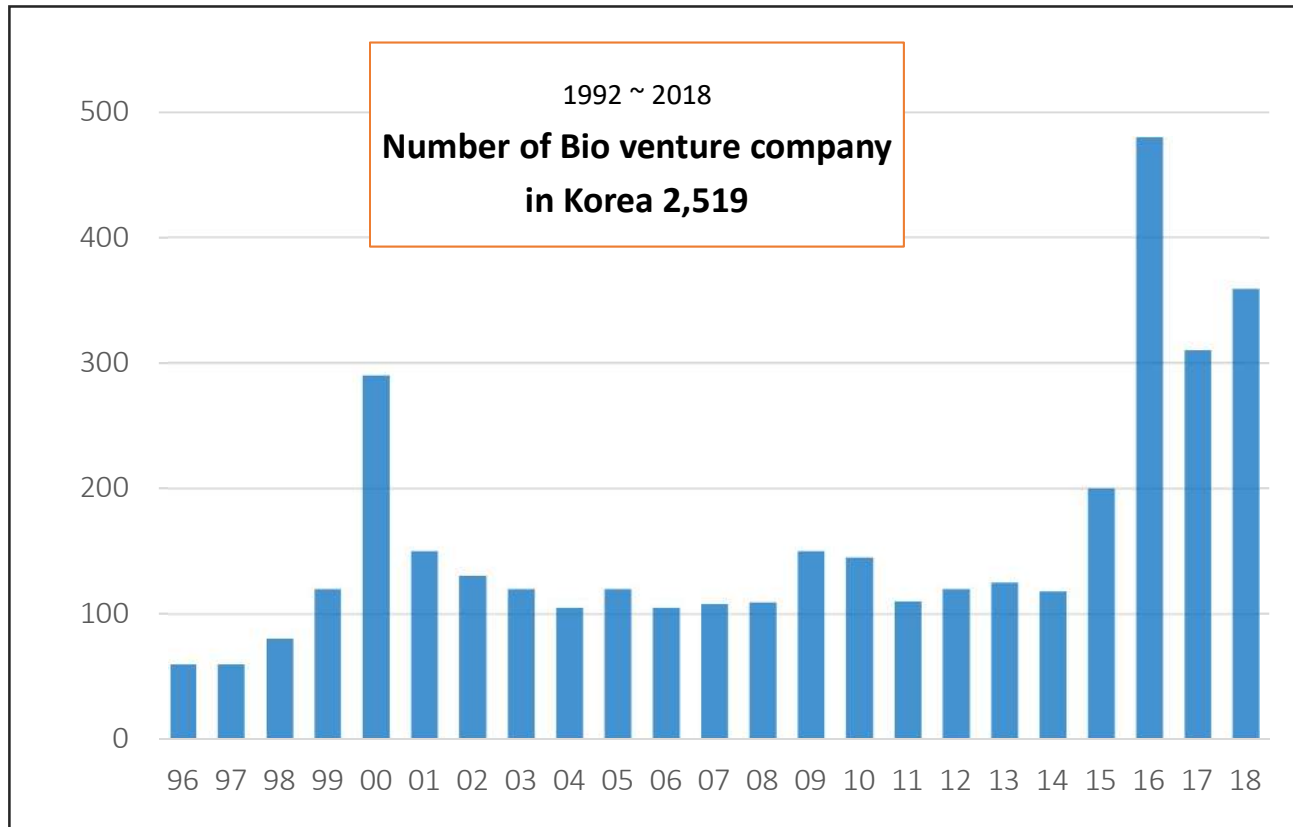
Top 3 ICT **22.7 Tril. KRW**  
SK Telecom • KT • LG U+

## Korea Venture Capital Bio/Medical Investment



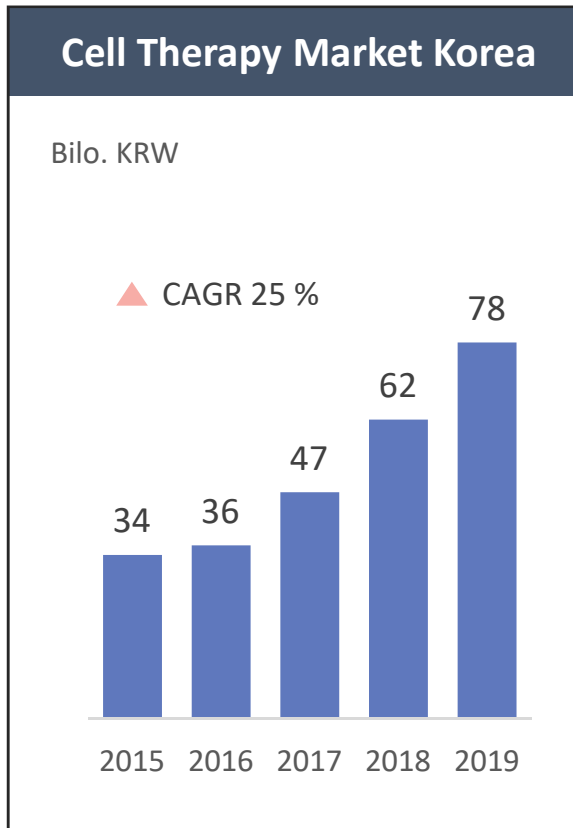
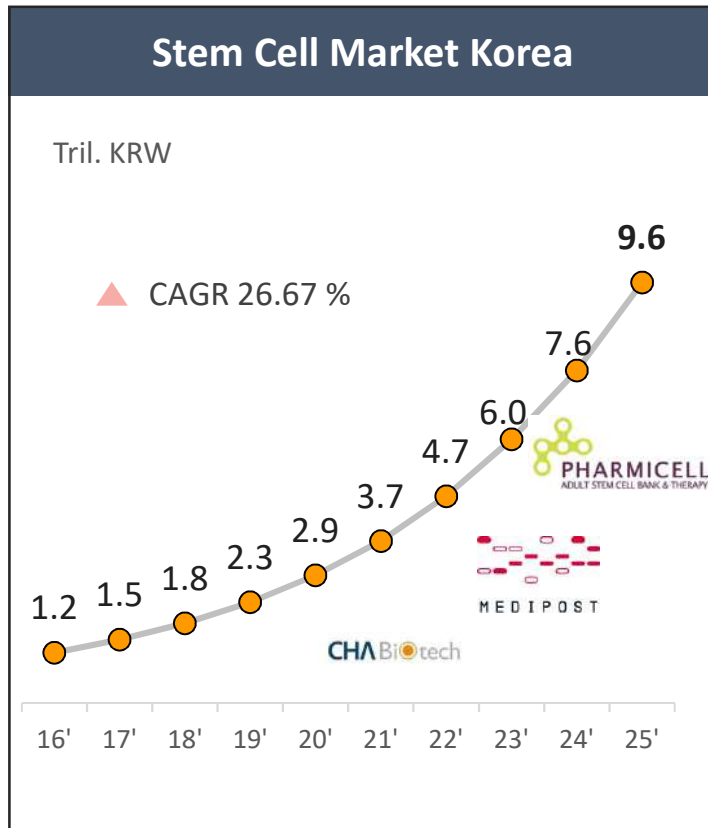
Source: Korea Venture Capital Association

# Number of newly established Bio ventures in Korea



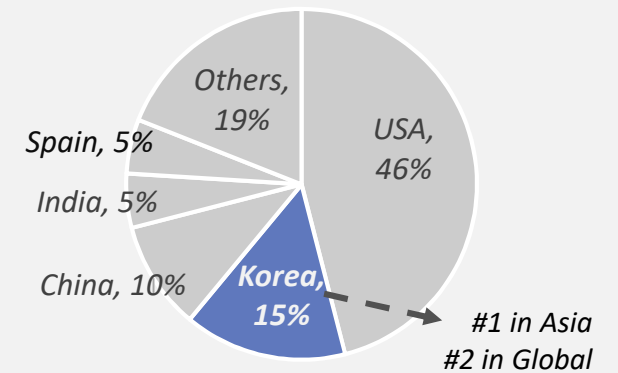
Source: 2018 Korea Bio ventures statistics, Korea Research Institute of Bioscience and Biotechnology

# Bio-pharmaceutical Products



- Enacted Advanced Regenerative Medicine Act to accelerate the development of new and innovative treatment
- Established National Center for Stem Cell and Regenerative Medicine (2016)

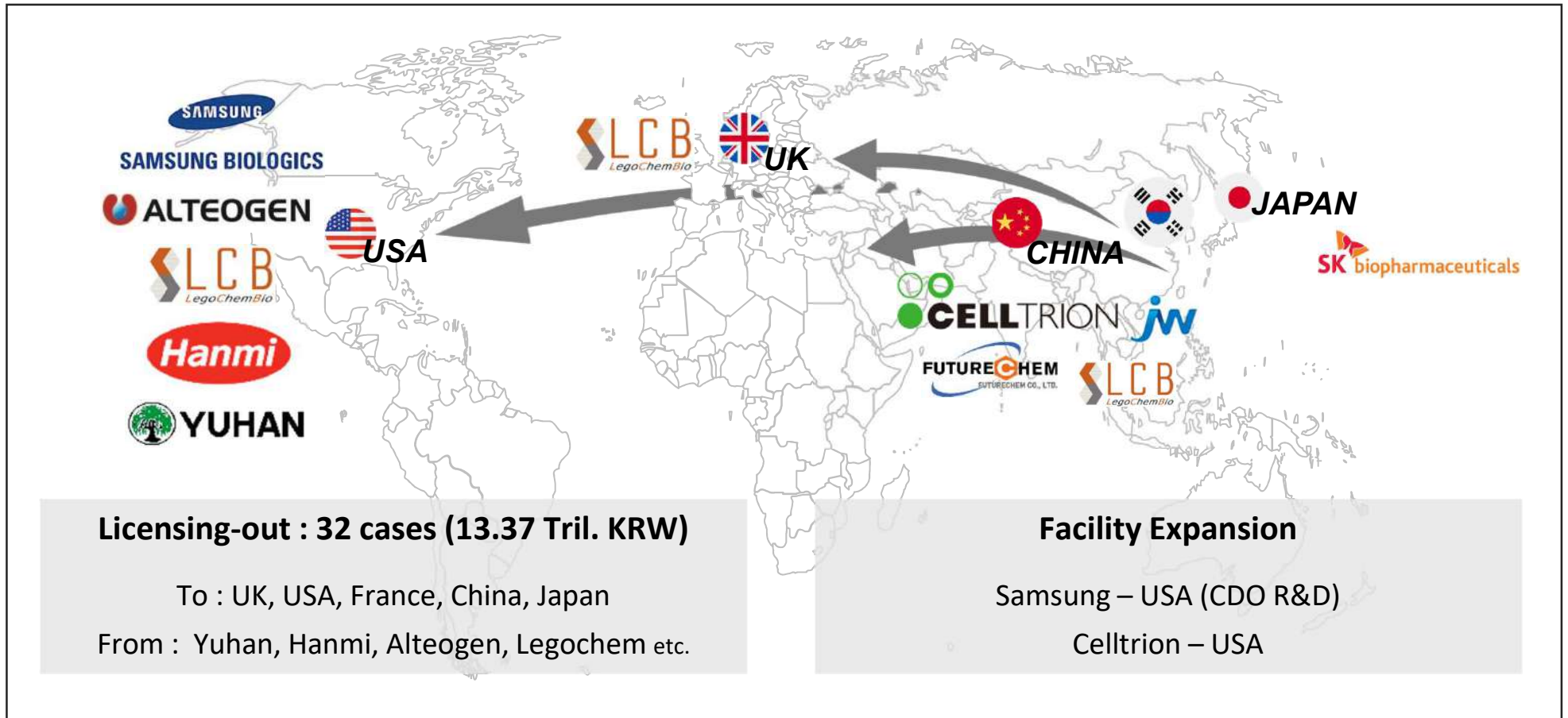
### # of Clinical Trials for Stem Cell treatment



Source:

- Global Stem Cell market Forecast 2017-2025 published by InkWood
- Korea Ministry of Food and Drug Safety, 2020

# Licensing out in 2021



Source: Maeil Business News Korea 2022

# Bio-pharmaceutical Products

## *Biologics*

Medicines containing substances derived or derived from living organisms.  
examples: Blood Products, Toxins or Anti-toxin, Vaccine





# Best Selling Drugs

## TOP PHARMA DRUGS BY SALES IN 2021 (USD Bn)

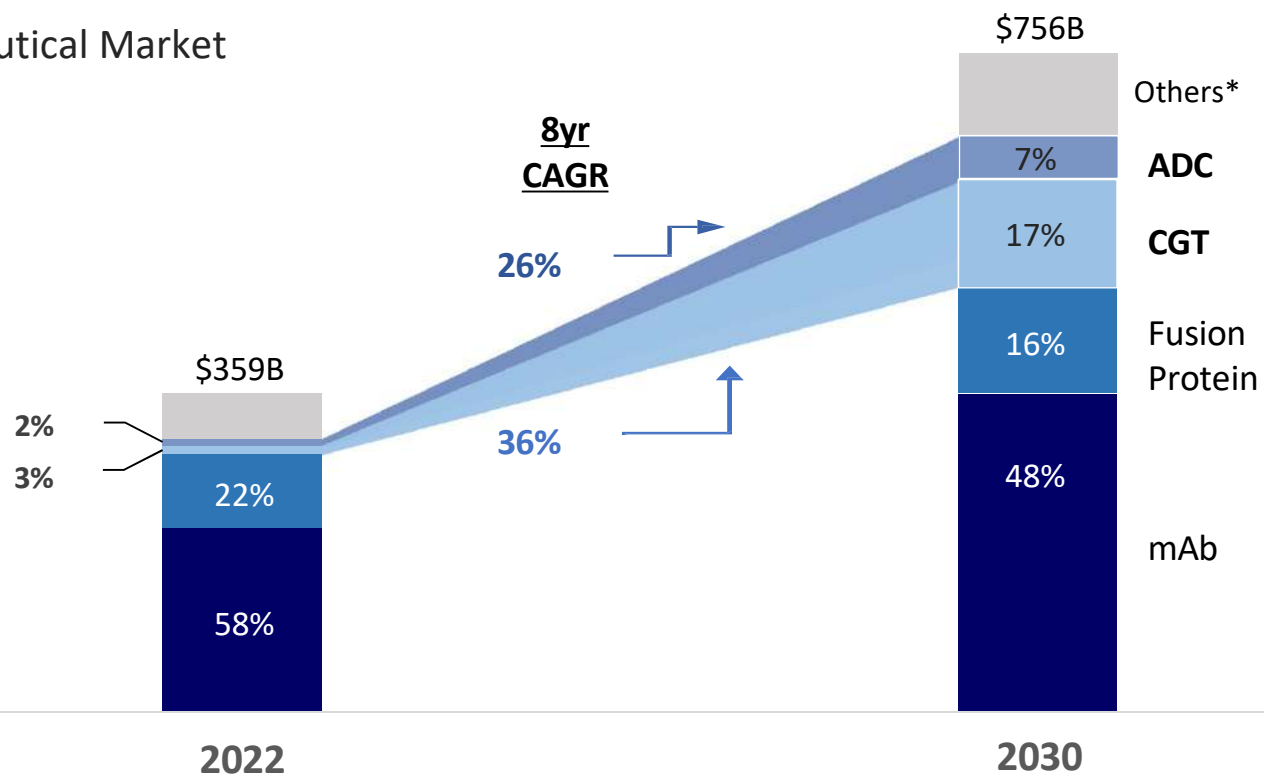


Source: [www.pharmacompass.com](http://www.pharmacompass.com)

# Portfolio Up: Investment in New Business

## Market Outlook

### Biopharmaceutical Market



\* Others include bispecific, biosimilar, plasma extract, etc.

Source: Evaluate Pharma & Samsung Biologics Internal Forecast

# Modalities

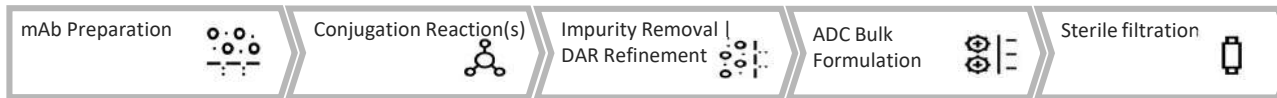
## mAb Process Development



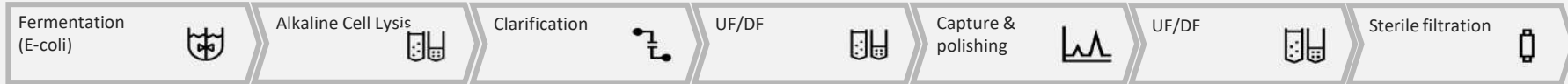
## mAb



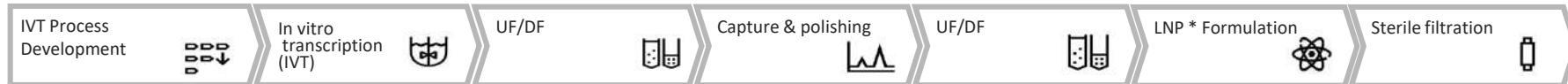
## ADC



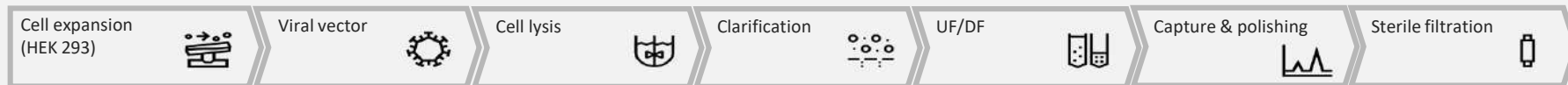
## Plasmid DNA



## mRNA / LNP



## AAV



# The Renaissance of Protein Purification

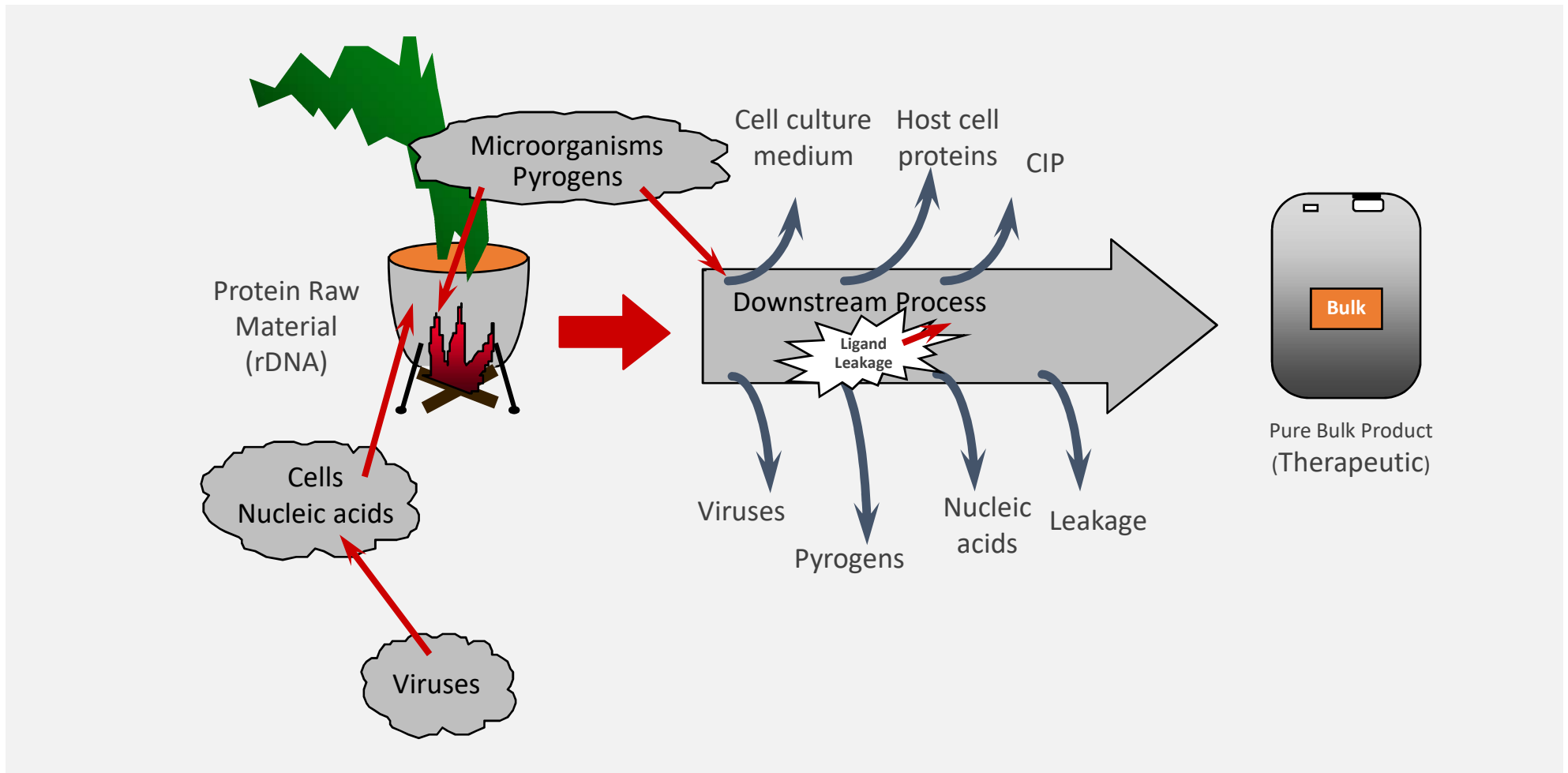


Michelangelo de Lodovico Buonarroti

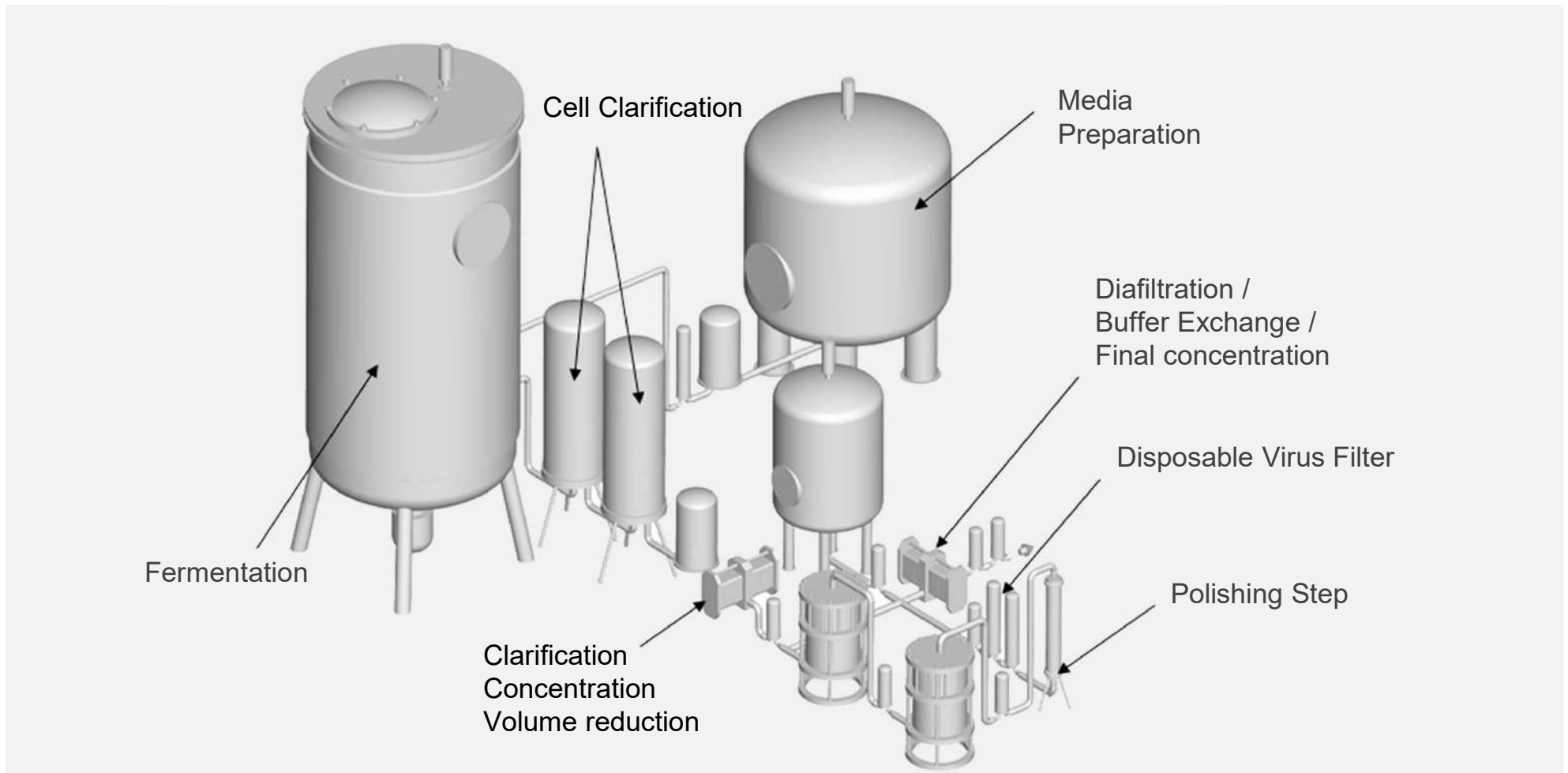


Source: 2005 David Gaya, Wikimedia Commons

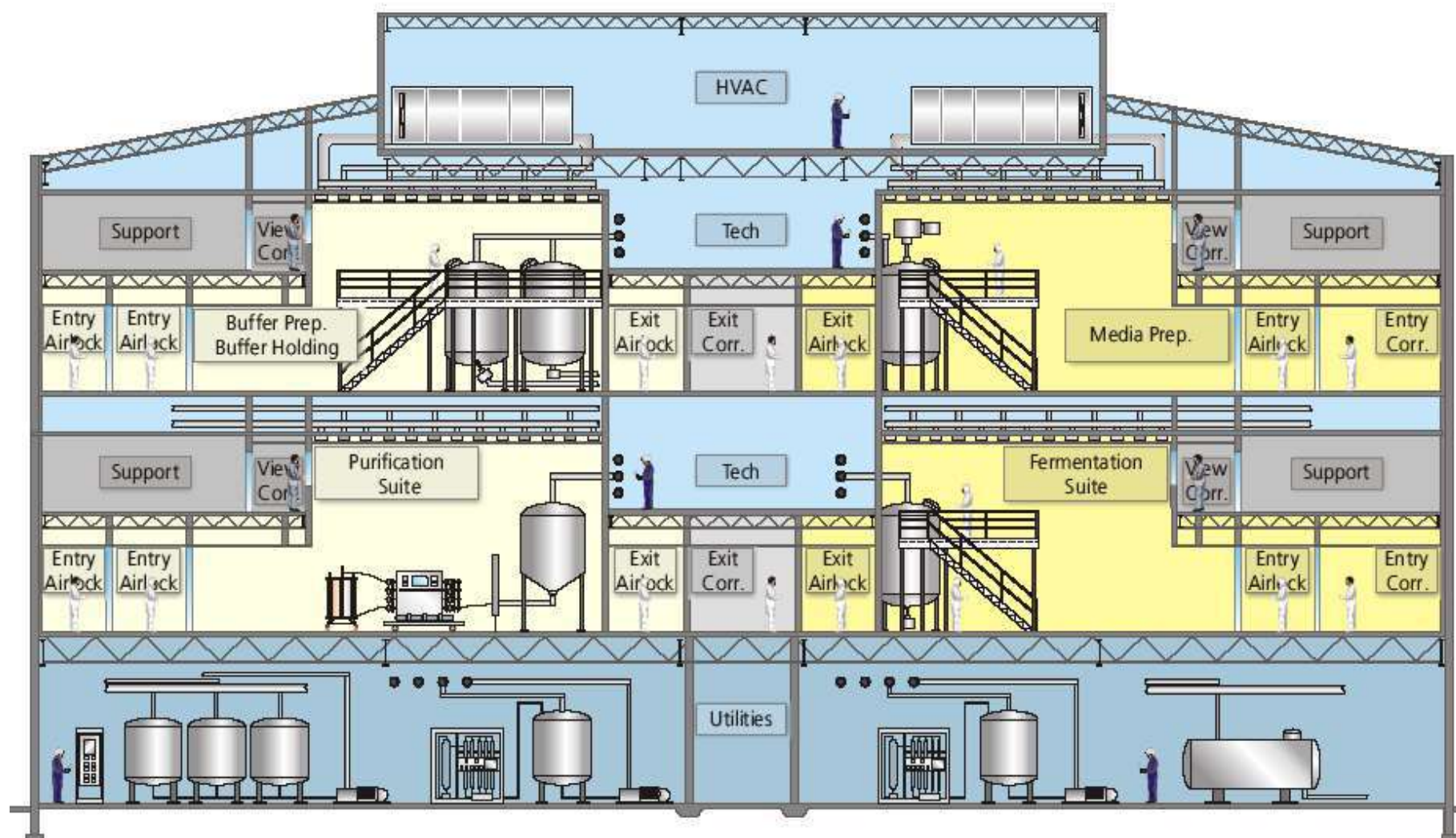
# Downstream Processing of Bio-Pharmaceuticals



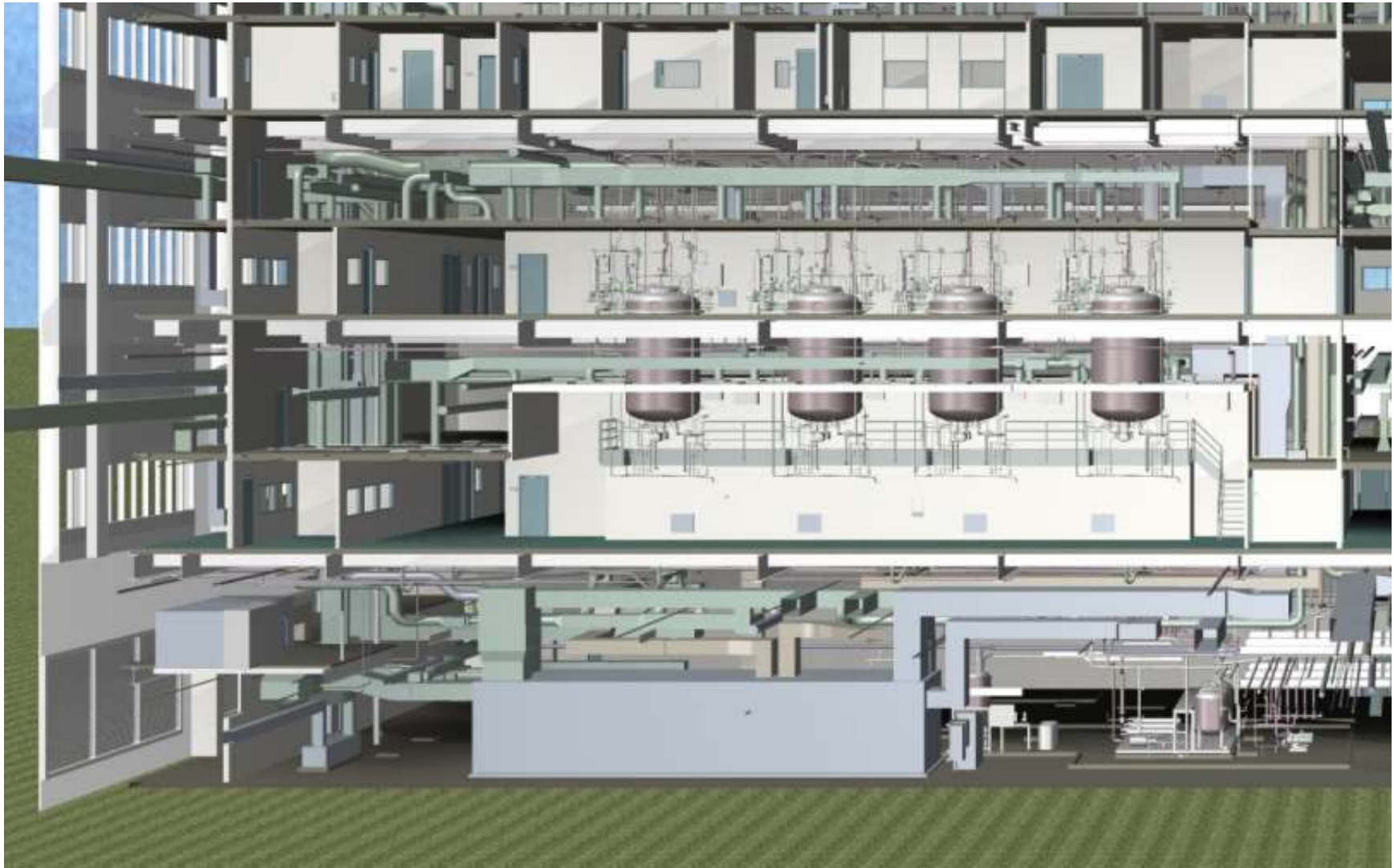
# Monoclonal Antibody Manufacturing Process



# Monoclonal Antibody Manufacturing Plant



# Monoclonal Antibody Manufacturing Plant

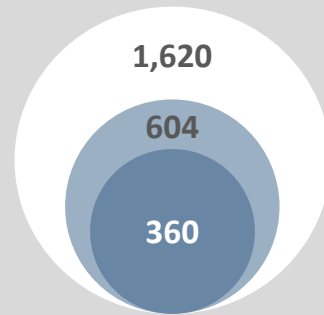




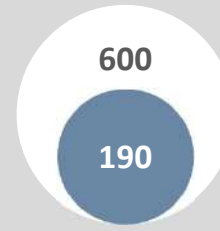
# CMO Capacity Worldwide



Unit: K ℓ



Samsung  
Biologics



Celltrion



Lonza



Boehringer  
Ingelheim

# CMO Capacity in Korea

## Major CMO customers in Korea

**SAMSUNG**  
BIOLOGICS

**CELLTRION**

**SK bioscience**

**LOTTE**  
BIOLOGICS

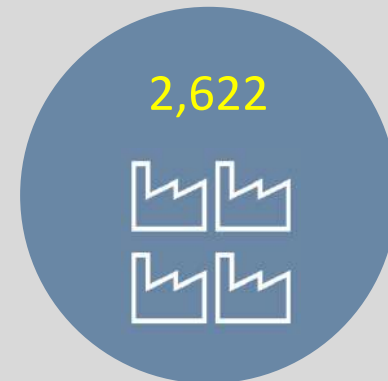
Unit: K ℓ



Current



2025

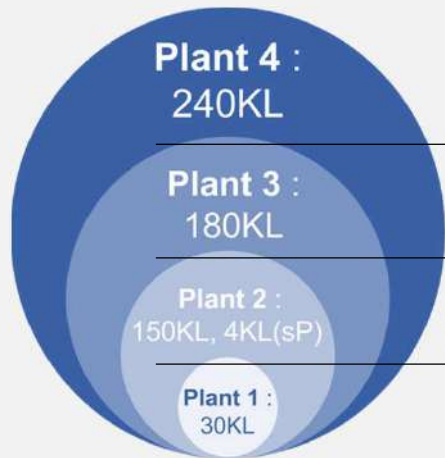


2030

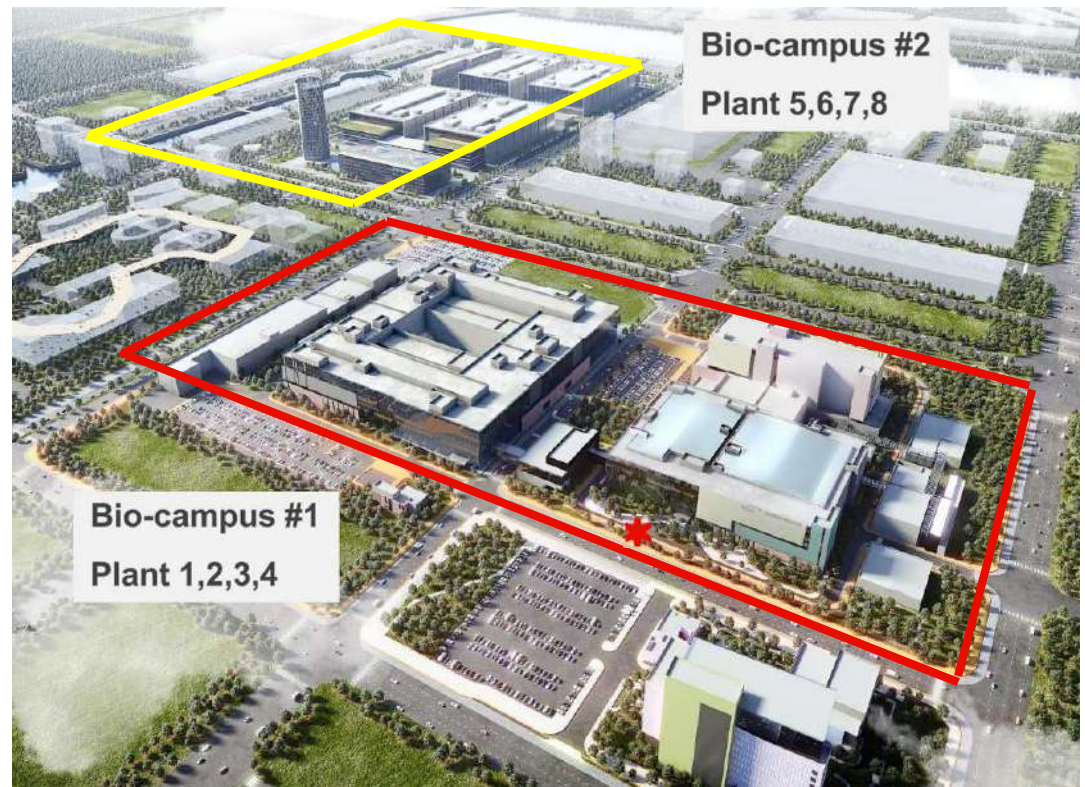
# Samsung Biologics

## Capacity Expansion

### Manufacturing Capacity in Bio-Campus #1



Total Capacity	Year
604KL	2023
364KL	2018
184KL	2016
30KL	2013



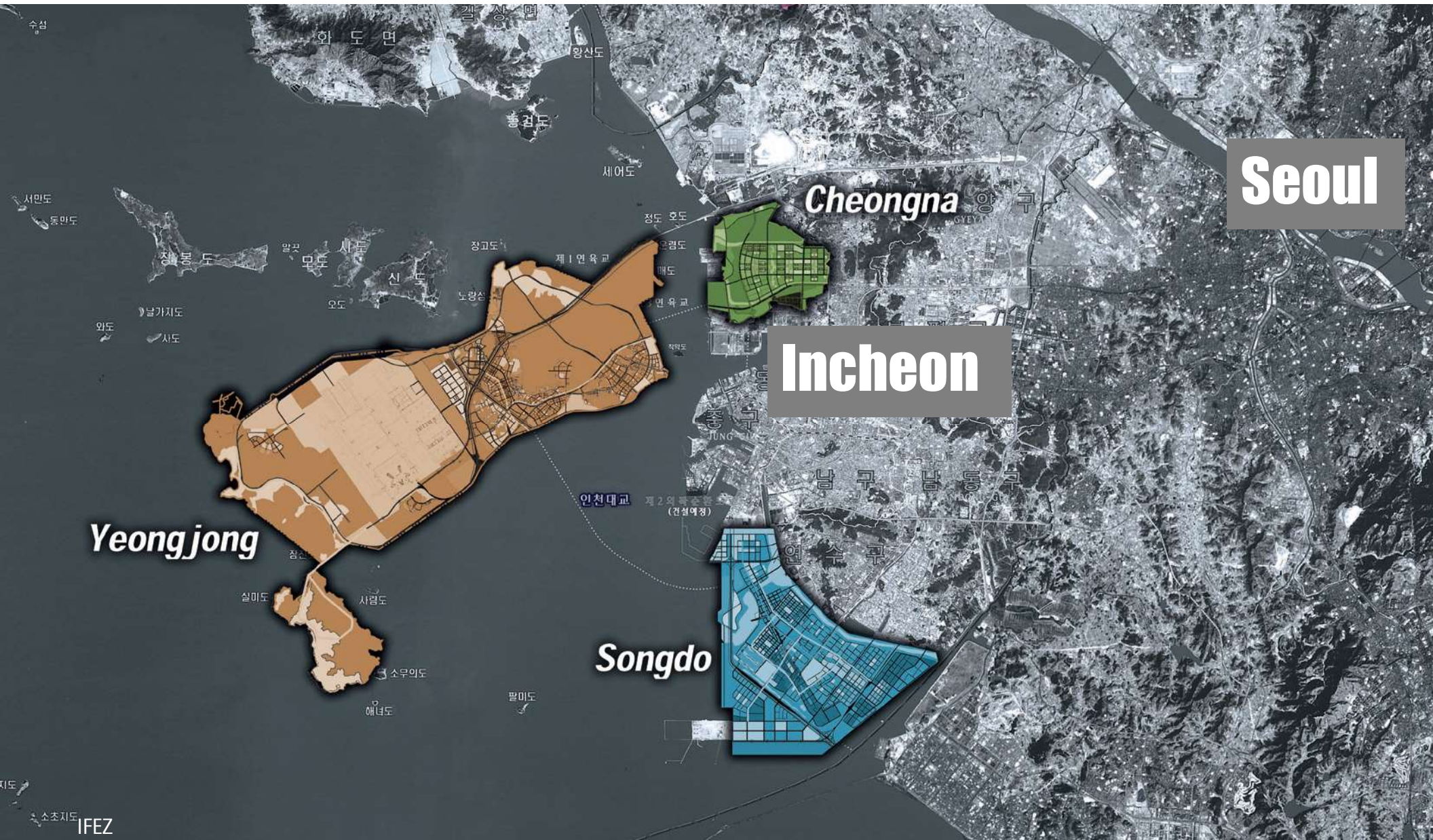
Source: Samsung Biologics

# Songdo, International Business City



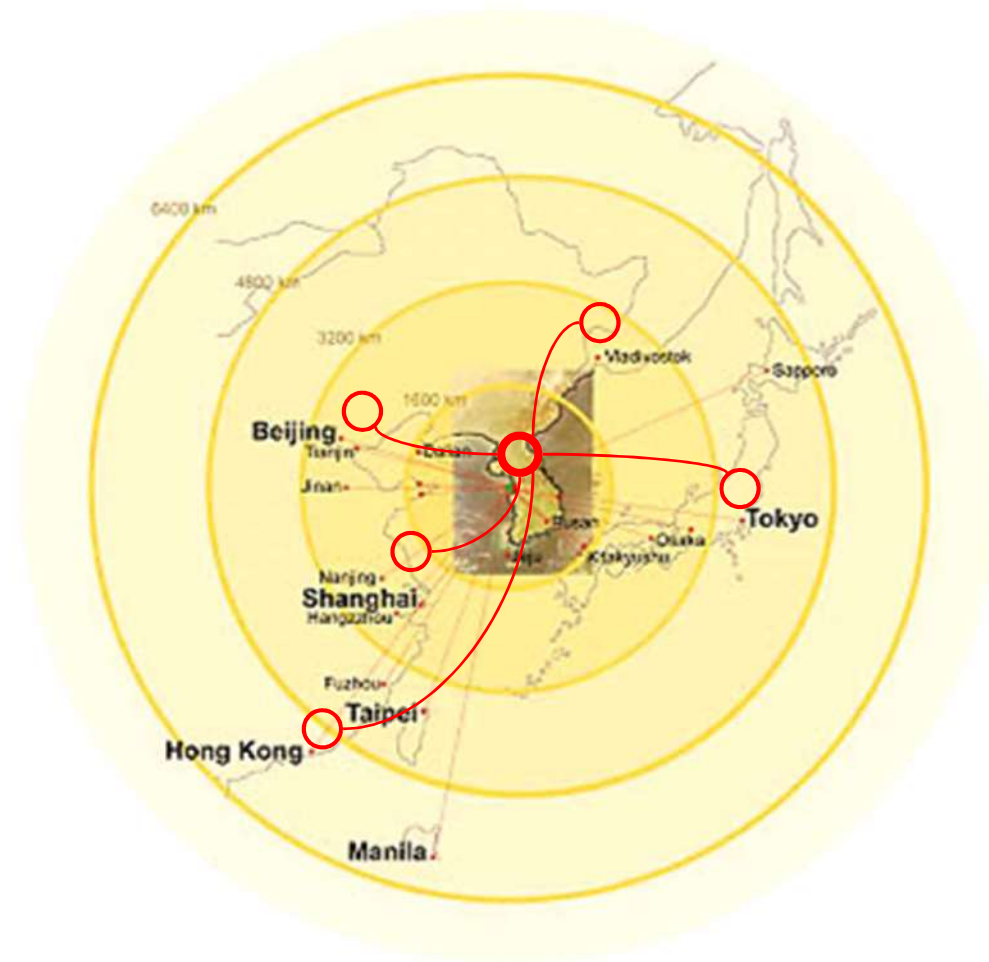
- **Artificial City built on reclaimed sea for High Tech**
- **Total size** 53.4km<sup>2</sup> (1/13 of Singapore)
- **Population** 201,698 (2023)

# Incheon Free Economic Zone (IFEZ)



# Competitiveness of Incheon

Incheon is within a 3.5-hour flight to 51 cities, each with a population of over one million.



Source: IFEZ

# Songdo Bio Cluster MAP



Source: IFEZ





# Sartorius Songdo Investment Plan



24,433 / ~93,000

Land area / Total floor area (m<sup>2</sup>)



\$ ~300M

Total Investment



3 Years

Construction Period



## Products and service portfolio

- Cell Culture Media
- Single-use products
- Membrane filters
- Process development Validation CDO/CRO
- Bioprocess specialized training



# Sartorius Songdo Campus Design



# Promote Industry

## Significant investments in new industries especially in digital healthcare

- Support commercialization of innovative healthcare services
- Develop Convergence Healthcare Devices
- Establish Institutional Foundations

## Fostering bio-health as the Next semiconductor industry

- National Blueprint focused on Global Bio-Health
- Alleviate location difficulties and assist tax measures
- Enable global collaborative research and workforce exchange



Source: Ministry of Trade, Industry and Energy

# Secure Supply Chain

## Enhance manufacturing Competitiveness

- Localization of raw materials; mRNA vaccine, biopharmaceutical raw materials, etc.
- Diversification of supply chain of API(active pharmaceutical ingredient), quarantine supplies, etc.
- Development of a Demand-supplier Cooperation System

## Expand bio-technology To respond to global issues

- Development and expansion of biodegradable plastic technology
- Expand Carbon Neutral Products
- Establishment of infrastructure for prototype and test evaluation



Source: Ministry of Trade, Industry and Energy

# Create Infrastructure

## Grow into a Global Vaccine Hub and create a future business market

- Build and activate manufacturing infrastructure by region
- Strengthening R&D in biopharmaceuticals and infectious diseases response
- Talent Training in various bio fields; manufacturing, IT-BT convergence, etc.

## Strong support for training Professionals in manufacturing

- Establish education center with manufacturing facilities and field-oriented curriculum
- Foster experts in vaccine manufacturing
- Train of professionals tailored to the needs of white bio companies



Source: Ministry of Trade, Industry and Energy



THANK YOU