



Korea National for Bioprocessing Research & Training

K-NIBRT Training Centre 2023 Curriculum Information

The leading training hub for global bio industry



About K-NIBRT

The 'Korean NIBRT Program Operation and Bioprocess Manpower Training Center Construction Project' is a national project to train professionals in Korean bio industry, one of Korea's new growth engines.

Yonsei University and Incheon City have established the government-led biopharmaceutical process development manpower training center through this project. This center is the first of its kind in Asia and the third in the world after BTEC in the US and NIBRT in Ireland.

We plan to construct new training facilities and establish a world-class GMP-based bioprocessing training infrastructure by 2024, followed by the implementation of a full-scale advanced training program aimed at producing 2,000 bioprocessing professionals by 2025.

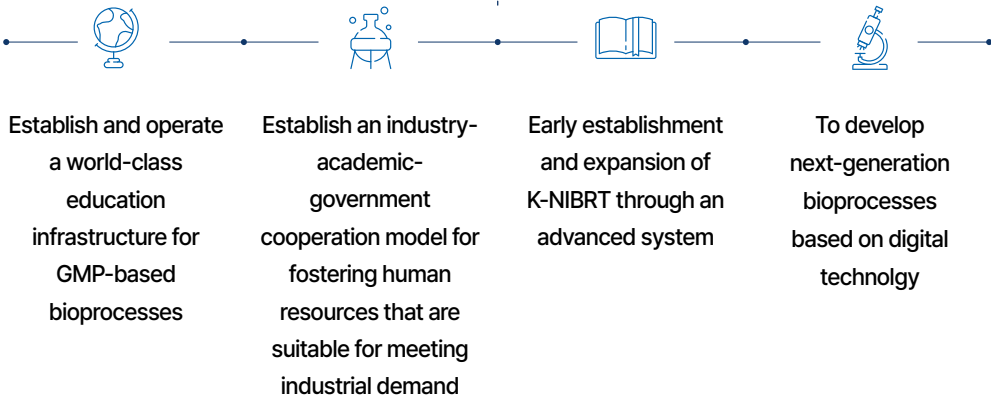
Vision

Achieve a healthy life for mankind
through the development of the bio-industry

Mission

Nurture future talents to lead the bio-industry

Goals



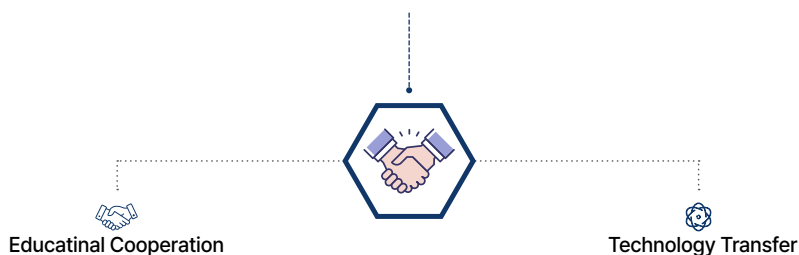
About NIBRT

National Institute for Bioprocessing Research and Training, Ireland: NIBRT is an institute for training pharmaceutical and biotechnological professionals in Ireland, established in 2011 with an investment of 57 million Euros (about KRW 74 billion) by the Irish government.

A global center of excellence for education and research in bioprocessing: NIBRT started as a government-led investment to cultivate talents in biopharmaceuticals. However, it is now recognized as one of the world's leading educational institutions in bioprocessing, conducting on-site education and research in all phases of pharmaceutical and bioprocessing, including drug production, good manufacturing practices of pharmaceuticals (GMP), and quality control (QC).

March 2021: Signed an MOU

June 2021: Signed an Agreement (to conduct educational consulting for seven years)



NIBRT education program: Customised Training, Short Training Courses, NIBRT Online Academy (NOA), Academic Programmes (NIBRT Masters Programmes), Springboard+ (a government-sponsored program)



Established through a memorandum of understanding with NIBRT in Ireland, K-NIBRT is the first bioprocessing training organization in Asia as a global partner of NIBRT. The training offered at K-NIBRT yields similar outcomes as the training offered at NIBRT.



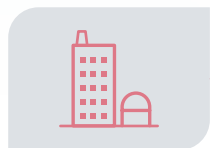
Pilot Training for Bioprocessing

Training program for prospective pharmaceutical and biotechnology employees

Type		Antibody Bioprocess Training	Vaccine Bioprocess Training
Training contents		Practical training in all areas of bioprocessing	Vaccine and process-specific practical training
2023 Training Schedule	Didactic	Sep-Nov 1st~3rd Didactic Training	Feb 1st Didactic Training May 2nd Didactic Training
	Hands-on	Dec 1st Hands-on Training	Mar 1st Hands-on Training Jun 2nd Hands-on Training
Training Method	Didactic	Live online learning	
	Hands-on	Face-to-face training (Location: K-NIBRT Training Centre)	

* For more information, please visit the K-NIBRT website (knibr.com)

Short-term training course for employees



- Short-term open course and company-customized training program
- NIBRT's open course program has been set as a benchmark for operation
- Customized curricula and training methods tailored to the needs of domestic companies
- Scheduled to commence from October to November
- For any inquiries related to the short-term training courses for employees, please contact zyoon@yonsei.ac.kr

Pilot training course for high school students



- A partnership with the Incheon Metropolitan City Office of Education was established with the aim of providing career experience education in the pharmaceutical and biotechnology fields for vocational high school students
- Scheduled to commence in July

Global curriculum with international organizations



- K-NIBRT Global Training Program is supported by the MOHW of the Republic of Korea and Asia Development Bank (ADB)
- The program aims to develop a global vaccine workforce from low- and middle-income countries in the Asia-Pacific region
- Scheduled to commence from August to September
- Plan to expand its operations in the future through collaboration with international organizations and global companies

Curriculum for Didactic Training

Week 1: Biopharmaceutical Basics

Lecture Themes

	Lecture Themes
Day 1	Orientation
	Introduction of Biopharmaceutical Industry
	Regulation of Biopharmaceuticals
Day 2	Cells and Enzymes
	Analysis of Genetic Information 1
	Analysis of Genetic Information 2
Day 3	Production of Recombinant Proteins 1
	Production of Recombinant Proteins 2
Day 4	How Cells Grow
	Core Technologies of Antibody Therapeutics
	Good Manufacturing Practice of Biopharmaceuticals
Day 5	Quality Assurance and Quality Control of Biopharmaceuticals
	Analysis and Microbiological Analysis of Biopharmaceuticals



Week 2: Principles for Bioprocessing

Lecture Themes

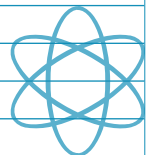
	Lecture Themes
Day 6	Upstream Processing
	Fermentation Issues
Day 7	Bioprocessing Basics including Aseptic Processing
	Purification Process
Day 8	Bioengineering
	Formulation & Fill Finish
Day 9	The Concept of Clean Room
	Upstream Process Development
Day 10	Introduction to Vaccines
	Lyoprocess



Week 3: Vaccine Manufacturing Process

Lecture Themes

	Lecture Themes
Day 11	Vaccine-related International Cooperation System and Application of QbD in CTD format
	Quality Control of Vaccines
Day 12	mRNA-LNP Manufacturing and Analysis
	QbD and Design Space
Day 13	Lifecycle Process Validation
	GMP Facility for Vaccine Manufacturing
Day 14	Vaccine Development and Licensing Strategy
	Aseptic Process Fill Finish



* The curricula and schedules above are subject to change according to the circumstances

Antibody Bioprocess Training

Vaccine Bioprocess Training

Curriculum for Hands-on Training

Fermentation

Lecture Themes				
DAY1	DAY2	DAY3	DAY4	DAY5
Recombinant cell preparation	Preparation of Lab BioReactor	Operation of Lab BioReactor	Understanding Pilot BioReactor	Cell Harvest and Cell disruption

Purification

Lecture Themes				
DAY1	DAY2	DAY3	DAY4	DAY5
Plasmid DNA isolation from bacterial culture and In vitro transcription for RNA synthesis		Chromatography column packing and Qualifying the column packing system	Chromatography and TFF(CFF)	Filter Integrity Test

DP/Fill and Finish

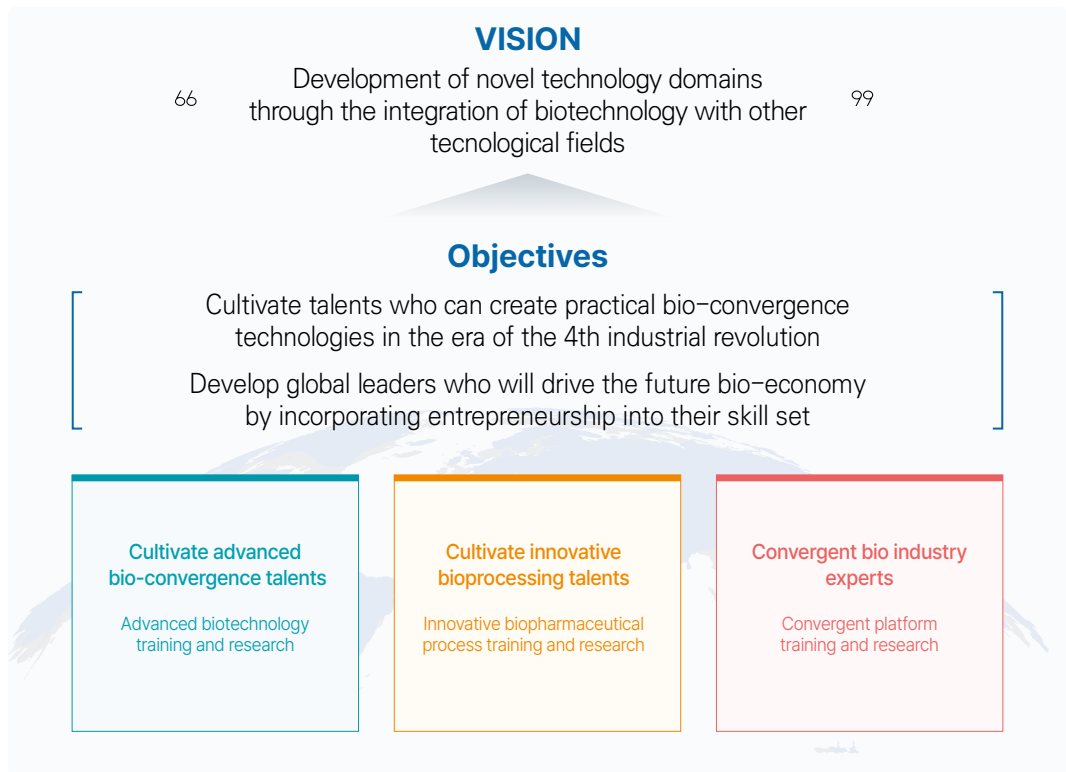
Lecture Themes				
DAY1	DAY2	DAY3	DAY4	DAY5
Basal buffer system Buffer exchange Protein concentration Stability	Protein purification and concentration Test Planning Method	LNP preparation LNP characterization	Critical temperature Lyo-cycle development Lyophilization	Fill & Finish Team Presentation

Analysis

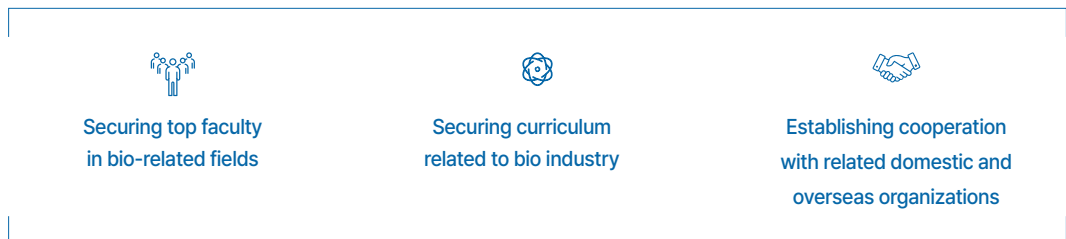
Lecture Themes				
DAY1	DAY2	DAY3	DAY4	DAY5
The test methods in the official compendia, Microbiological test methods	UV/VIS spectrophotometry, High Performance Liquid Chromatography	Capillary Electrophoresis, Endotoxin test	Poymerase Chain Reaction (PCR), Gel Electrophoresis (GE), Gel image analysis	Protein Analysis: SDS-PAGE, Image analysis

* The practical course curriculum is reorganized according to the educational purpose and period, such as antibody process education and Culture vaccine process education







Vision and Objectives



Competencies of the Graduate School



Courses courses and conferred degrees

 Name of the department	Biotechnology and Translational Medicine, The Graduate School	 Semesters	2 Semesters per academic year
 Courses	Master, PhD, Master / PhD joint course Master of Science / PhD in Science Master of Engineering / PhD in Engineering	 Eligibility	1. Graduates from a 4-year college (Bachelor's degree) in either a domestic or overseas institution or possesses equivalent qualifications 2. An individual who is capable of excelling as an innovative leader in the pharmaceutical industry by cultivating expertise in biotechnology and paractical skills in the field
 Conferred degree	Engineering / Science (determined by their field of research)		
 Details	For more information regarding the admission, please refer to graduate.yonsei.ac.kr		

Results of Training at K-NIBRT in 2022

Didactic Training

Type	General process training			Vaccine-specialized training		
	1st	2nd(Specialized)	3rd	1st	2nd	3rd
Number of applicants	129	100	75	80	142	79
Number of students	55	91	53	42	79	51
Number of graduates	52	91	50	37	66	44

Hands-on Training of Vaccine Specialized Training

Type	1st				2nd				3rd			
Number of applicants	45								49			
Number of students	16				16				42			
Number of graduates	Fermentation	Purification	DP/Fill and Finish	Analysis	Fermentation	Purification	DP/Fill and Finish	Analysis	Fermentation	Purification	DP/Fill and Finish	Analysis
	13	13	14	15	13	12	10	13	34	35	32	37

Korea-ADB Vaccine Manufacturing Training

Type	1st						2nd					
	Didactic		Hands-on				Didactic		Hands-on			
Number of applicants	56											
Number of graduates	33		33				26		26			

Digital Bioprocessing Complex



Bioprocessing Technology Training Center
(Scheduled to be completed by October 2024)



Bio & Pharmaceutical Commercialization Center
(Scheduled to be completed by December 2024)

Address

- (K-NIBRT Working Group) #209, Freedom Hall B, 85, Songdogwahak-ro, Yeonsu-gu, Incheon
- (K-NIBRT Training Centre) #B102, Y-Plaza, 85, Songdogwahak-ro, Yeonsu-gu, Incheon