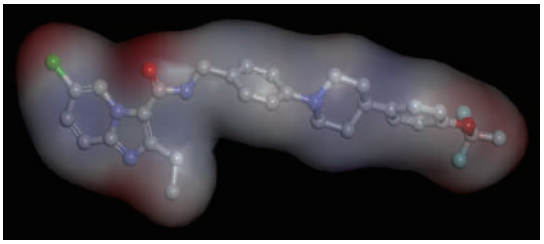
Institut Pasteur Korea

“Science knows no country,
because knowledge belongs to humanity,
and is the torch which illuminates the world.”

Louis Pasteur (1822-1895)

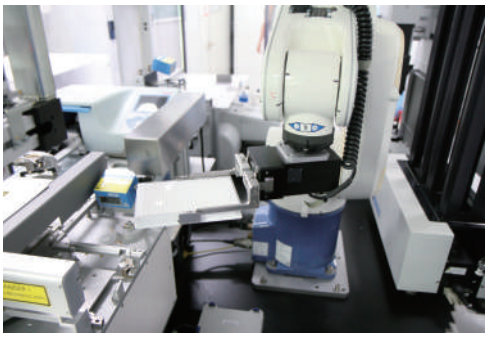
I First-in-Class Tuberculosis Drug Discovery



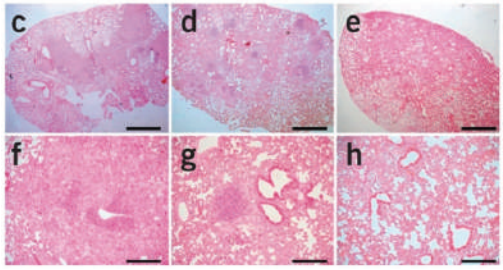
Q203 (Telacebec) is a first-in-class, orally available cytochrome bc1 inhibitor developed for the treatment of tuberculosis and other non-tuberculous mycobacterial (NTM) infections. It has demonstrated efficacy not only against drug-resistant tuberculosis but also against diseases such as Buruli ulcer and leprosy.

Institut Pasteur Korea (IPK) developed Q203, a novel drug candidate that effectively inhibits multidrug-resistant (MDR) and extensively drug-resistant (XDR) tuberculosis, by screening approximately 200,000 compounds using its image-based high-throughput phenomic screening platform.

Nature Medicine, September 2013. doi: 10.1038/nm.3262.

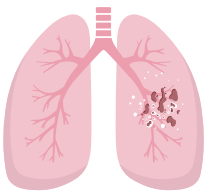


◀ Phenomic Screen™



◀ IPK found strong potency of Q203 in the mouse model. The lungs (c, d, e) 28 days after treatment with the control groups (f, g) and the Q203 (h) (Source: Pethe, K., Bifani, P., Jang, J. et al. Discovery of Q203, a potent clinical candidate for the treatment of tuberculosis. Nat Med 19, 1157-1160 (2013)).

Status of Technology Transfer & Clinical Trials



Technology transfer

Phase 2A clinical trial completed

Q203 was licensed out to Qurient Co.,Ltd.,completed a Phase 2A clinical trial, and was licensed out to TB Alliance in 2023 for further development.

Q203 completed a Phase 2A clinical trial in 2018 as a treatment for multidrug-resistant tuberculosis, and in February 2025, it completed a Phase 2A trial in Australia as a treatment for Buruli ulcer.

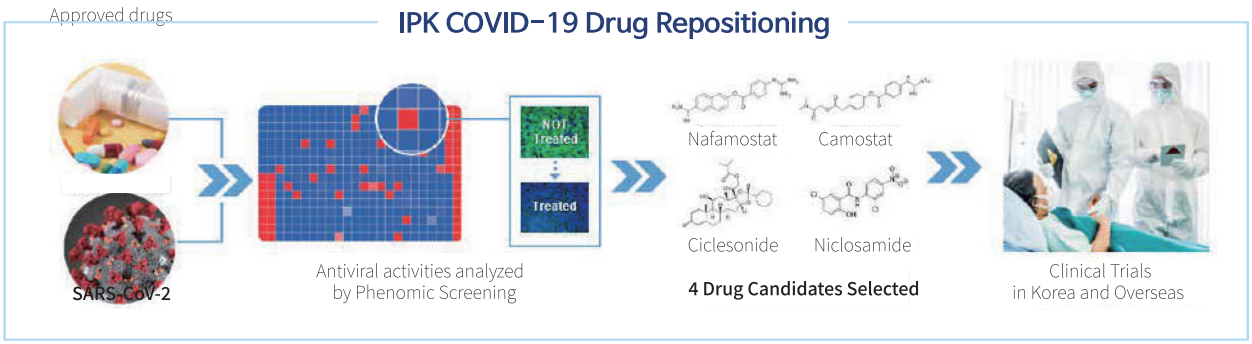
Key Achievements of IPK

Ⅱ Discovery of COVID-19 Drug Candidates

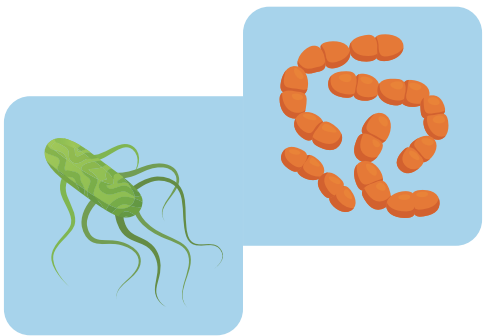
Before the COVID-19 virus was secured, a preliminary study was conducted using the SARS virus (SARS-CoV-1), which was expected to exhibit similar antiviral effects (February 2020).
IPK was obtained in 2018 through research cooperation with the HKU-Pasteur Research Pole, a member of the Pasteur Network. After receiving the COVID-19 virus from the Korea Disease Control and Prevention Agency (KDCA), IPK screened approximately 3,000 drugs within four weeks and identified around 20 candidate drugs. The research results were released within five weeks.
Antimicrobial Agents and Chemotherapy, June 23, 2020. doi: 10.1128/AAC.00819-20.

Through a follow-up screening study, four promising candidates were selected: nafamostat, camostat, ciclesonide, and niclosamide (March 2020 onward).
Journal of Medical Virology, March 2023, doi: 10.1002/jmv.26397.

Efficacy screening was conducted on both existing and developmental COVID-19 therapeutics and candidate compounds to assess their antiviral activity against the Alpha and Beta variants. This evaluation confirmed their effectiveness against these variants.
Microbiology Spectrum, September 2021, doi: 10.1128/Spectrum.00472-21.



Ⅲ Research on Combating Antibiotic Resistance



The Antibiotic Resistance Lab and Screening Discovery Platform at IPK have been collaborating with GARDP since 2018 with the aim of discovering new antibiotics that effectively inhibit Klebsiella pneumoniae and Acinetobacter baumannii.

By evaluating the efficacy of more than 48,000 compounds provided by global pharmaceutical companies, 72 compounds were confirmed with activity against K. pneumoniae and drug-resistant A. baumannii, with two showing activity against extensively drug-resistant (XDR) A. baumannii.

EBioMedicine, April 2024. doi: 10.1016/j.ebiom.2024.105073.

Key Milestone

Institut Pasteur Korea (IPK) is a distinguished research institute specializing in infectious diseases, established through a collaborative scientific exchange between Korea and France.

Since its founding in 2004, IPK has achieved remarkable success in both fundamental and translational research related to infectious diseases. The institute has been at the forefront of establishing and optimizing drug development platforms and infrastructure, solidifying its position as a premier hub for infectious disease Research and Development (R&D) within the Asia-Pacific region.

2003.12	General Agreement on the Establishment and Management of Institut Pasteur Korea (Institute of Science and Technology (KIST) - Institut Pasteur)
2004.04	Establishment of Institut Pasteur Korea (in KIST)
2005.07	Institut Pasteur Korea - Gyeonggi Provincial Government General Agreement
2008.05	The 1st BSL3 facility certified in Korea (in KIST, Certified by Korea Disease Control and Prevention Agency (KDCA)
07	Establishment Spin-off Bio Venture Company, Qurient, Inc. Ltd.
2009.04	The 1st BSL3 facility in a new building certified in Korea (in Pangyo, Certified by KDCA)
2014.05	Designation as a member campus of University of Science Technology (UST)
2016.02	Qurient went public on Korea Securities Dealers Automated Quotation KOSDAQ)
2023.09	"University of Science and Technology (UST) School Certification (Major: Advanced Drug Discovery & Development)
11	Establishment of Research Resource Center (Certification issued by KDCA)

Awards

2009.11	Ranked top in Lab Safety (Ministry of Education and Science Technology
2013.11	Awarded for Outstanding Biosafety Management (Ministry of Health and Welfare
2019.09	Awarded Commendation for Contribution to Biosecurity Management (Minister of Trade, Industry and Energy)
2021.11	Awarded for Excellent Institution for LMO Safety Management (Ministry of Science and ICT)
2025.12	Awarded Commendation for Contribution to Biosecurity Management (Ministry of Trade, Industry and Resources)

Vision & Mission

IPK is committed to contributing to public health by focusing on the development of therapeutics for high-risk infectious diseases, as well as innovative mRNA vaccines. Our research places strong emphasis on identifying novel drug candidates that target a wide range of pathogens, with a focus on advancing precision R&D to develop compounds with high clinical potential.

In addition, IPK is enhancing its vaccine research and development capabilities to establish a cutting-edge mRNA vaccine platform, which will be further strengthened through strategic collaborations with leading research institutions both in Korea and abroad.

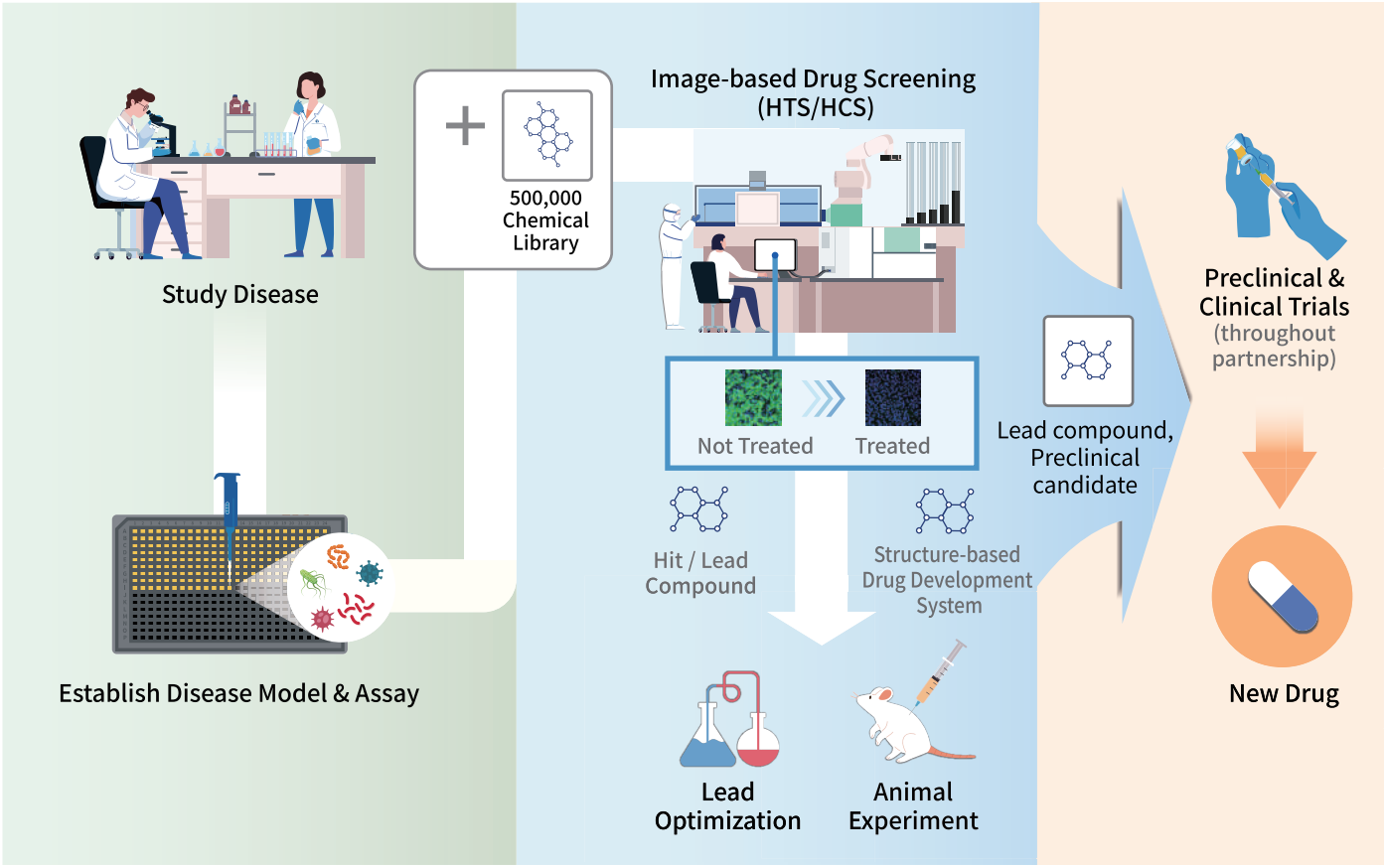
Accelerating Therapeutic Development

Development of drug candidates with high clinical potential

Fortifying Vaccine R&D

Establishment of an mRNA vaccine development platform & securing partnerships with domestic and international institutions

Research & Technology at a Glance



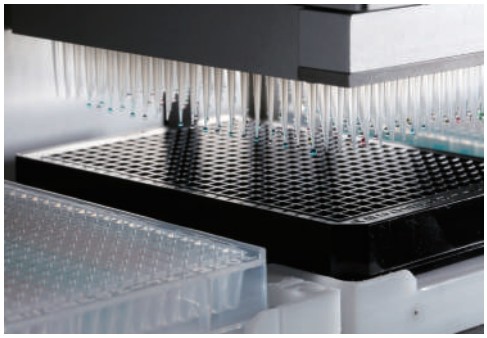
R&D Infrastructure

Biosafety Level 3 (BSL3) Laboratory

- First BSL-3 facility to achieve national certification in Korea
- Designed to handle group 3 pathogens such as coronaviruses (SARS-CoV, SARS-CoV-2, MERS-CoV), Mycobacterium tuberculosis, high-risk influenza, and SFTS virus

Biosafety Level 2 (BSL2) Laboratory

- First BSL-3 facility to achieve national certification in Korea
- Designed to handle group 3 pathogens such as coronaviruses, Mycobacterium tuberculosis, high-risk influenza, and SFTS virus



Screening Platforms

- Employs robotic-based high-throughput / high-content screening platforms to test chemical libraries and RNAi collections
- Fully-automated screening platforms operated within BSL2 and BSL3 laboratories optimized for most biological and infectious pathogen research
- Discover novel drug candidate, biomarkers, probes, and more

- **Chemical Screening**
  Chemical screening can be used to identify molecules with biological activity from our libraries covering 500,000 compounds, including synthetics and natural products. The diverse collection was assembled with the help of internal medicinal chemistry experts and collaboration with established strategic partners.
- **RNAi Screening**
  RNAi technology enables sequence specific knockdown of genes to identify new targets and cell signaling pathways for disease understanding. Our RNAi collections covers both siRNA and shRNA technologies for gene by gene systematic interrogation of our biological models.
- **Automation Management Solution**
  Multimodality instrumentation and automated microscopes are intergrated into our robotic platforms for fast reliable data acquisition. Our detection technologies include fluorescence, bioluminescence, absorbance, and high-content imaging to enable understanding of simple to complex biological interactions.

Animal Laboratory

- Contains Specific Pathogen Free (SPF) laboratory, Animal Biosafety Level 2 & 3 (ABL2, ABL3) laboratories
- Carries out in vivo efficacy/toxicity analyses of novel compound, infection mechanism studies, and maintenance of laboratory animal resources such as transgenic mice

Research Resource Center

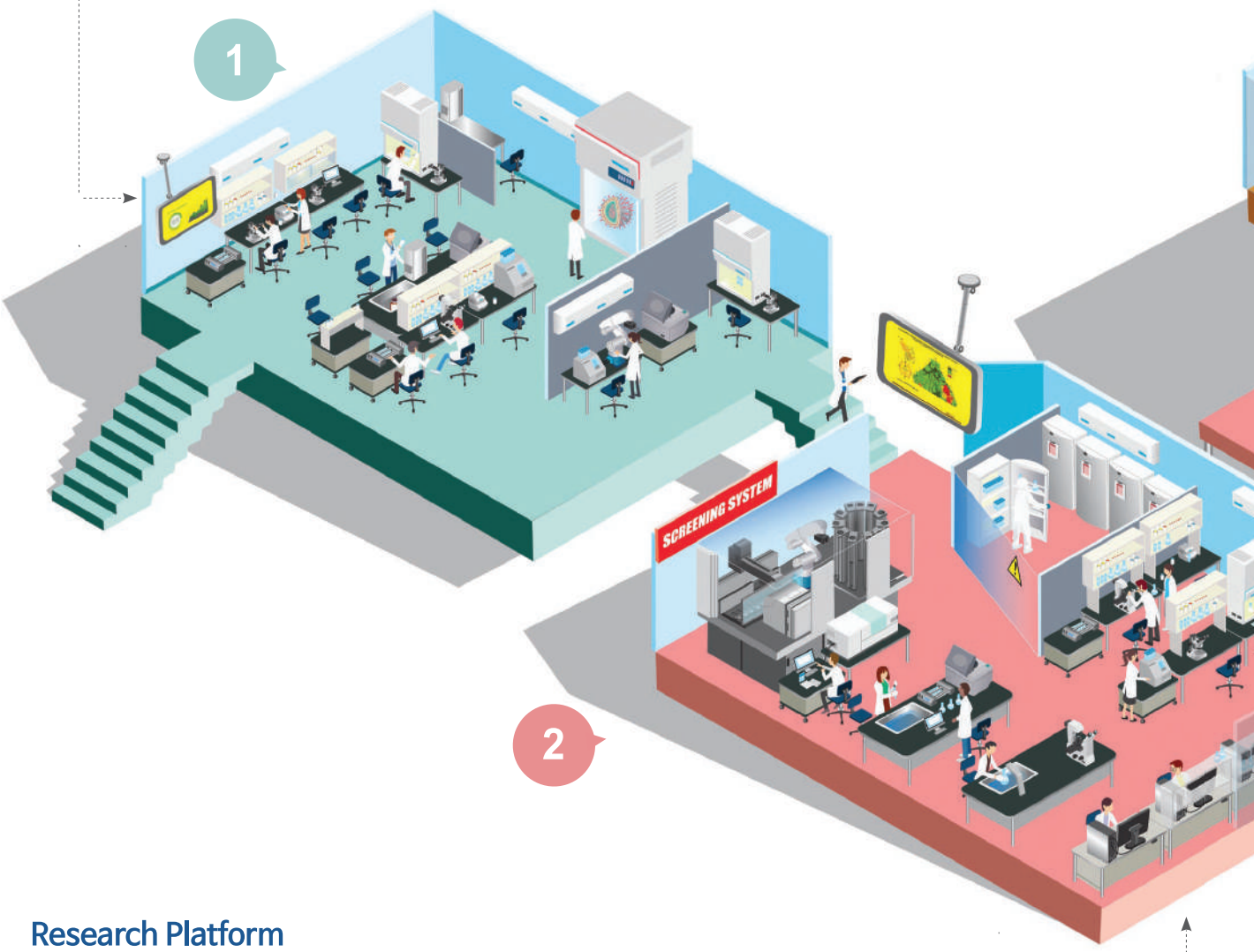
- Allow access to the BL3 and ABL3 facilities for external organizations
- Collect, manage, and utillize infectious disease research resources

IPK'S Drug Discovery Approach

Understanding Pathogens

IPK has been fighting infectious and neglected disease.

· Zoonotic Viruses · Respiratory Viruses · Applied Molecular Virology
· Antibiotic Resistance · Hepatitis Viruses · Tuberculosis · Parasites



Research Platform

IPK utilizes image-based, high-throughput / high-content screening [HTS/HCS]) platform optimized for infectious disease research. They are operated in BSL2 and BSL3 laboratories enabling the effective study of infectious diseases and the establishment of innovative strategies for treatment, prevention, and diagnosis.

· Screening Platform · Applied Molecular Biochemistry
· Chemical & Structural Biology of Pathogen · mRNA Vaccine Platform

Drug Design, Medicinal Chemistry, Animal Research

The hit/lead compounds identified by screening are further developed by experts in medicinal chemistry and animal research to ensure their ex vivo and in vivo efficacy and safety. IPK also operates a Biobank to collect and provide resources for infectious disease research.

· Lead Optimization · ADMET
· AI Structure-based Drug Design · Efficacy Test in Animal Models
· Biobank

Commercialization & Industrial Partnership

Drug candidates developed through basic and translational research are further investigated in follow-up research such as (pre)clinical trials through technology transfer.
IPK is making multifaceted efforts to translate excellent research outcomes into the application to ultimately benefit patients. For this means we work closely with industry, university, and institute partners at home and abroad.

· Invention Disclosure · Intellectual Property · Licensing
· Consulting · R&D Collaboration · Material Transfer Agreement

Screening Services

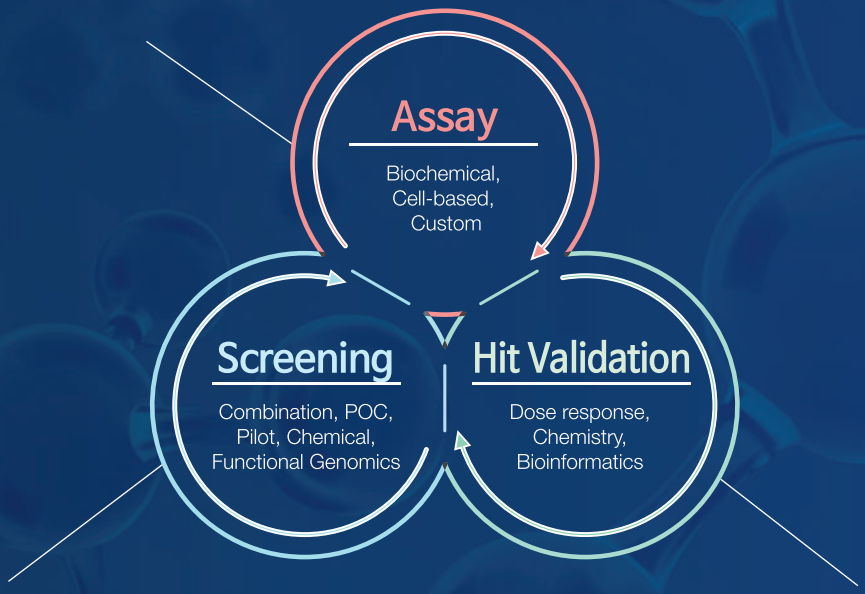
IPK's screening team provides various services through all stages of the screening process. Our professional staff members work closely with each investigator to customize their screening project.

Fee-for-service

1.1 Biochemical assays performed on multi label plate readers include Envision, Victor, Trilux and Spectramax: Radiometric; Fluorescence; Luminescence; HTRF; Absorbance

1.2 Cell-based assays are performed on automated high-content imagers (confocal and epi fluorescent) including Operetta, Opera, Image Express: Cytotoxicity; Translocation; Migration; Reporter; Expression

1.3 Flexibility and expertise to customize assay through all stages of development, validation, optimization



2.1 Combination Screening: 〈100 compounds tested in combinations to assess effects (synergy, additive, antagonist)

2.2 Proof of Concept Screening: 〈100 compounds to validate assay and establish preliminary data

2.3 A) Small Scale Screening: 2,000 to 10,000 compounds tested against FDA approved libraries, bioactives, and investigational drugs. Libraries can be selected from a number of commercially available libraries offering access to anti-cancer, kinase, and clinical candidates.

B) Medium Scale Screening: 10,000 to 50,000 compounds tested against a subset of libraries containing diverse scaffolds.

C) Large Scale Screening: 50,000 to 200,000 compounds tested against the entire library representing numerous and diverse scaffolds

2.4 Screening for Targets: A) Focused Screening: Human Druggable, kinas, and phosphatase library sets available.

B) Genome-wide screening: Libraries covering the entire human genome of ~18,000 genes

3.1 Dose Response studies to assess potency and confirm

3.2 Chemistry such as clustering, SAR, and analysis

3.3 Bioinformatics including database searches for targeting, prioritization

3.4 Molecular modeling of hits with probable target protein

3.5 Receptor-based and ligand based **virtual screening** of chemical libraries

Virus Research Resource Center

Institut Pasteur Korea Virus Research Resource Center (VRRC) serves as critical research infrastructure for basic research on viruses.
VRRC allows external researchers to use the facilities as open labs to further increase national infectious disease R&D capabilities and creat snergy through collaborative research.

IPK VRRC

Institut Pasteur Korea
Virus Research Resource Center

Open Lab facility for industry, academia, and research institute in the Seoul metropolitan area

Allow access to the BL3 and ABL3 facilities, typically challenging to establish within the private sector, for external organizations.

Collect, manage, and utilize infectious disease research resources through the Virus Resource Bank

Strengthen national infectious disease R&D capabilities

Open-access BL3 Lab

State-of-the-art BL3 and ABL3 facilities available for research use

- Includes laboratory, freezer room, breeding room (mouse), preparatory room, and necropsy/ treatment rooms, and more

Pathogens used
IBC-approved Risk Group 3 (or lower) pathogens or Living Modified Organisms (LMOs)

Animals handled
Mouse

- Fee-for-service available

Provision of research resources

Distribution of high-risk pathogens and specimens

- Heat-inactivated monkeypox virus,
- SARS-CoV-2 virus,
- Dengue virus,
- Influenza virus, among 149 cases

*Established in 2023, the Global Infectious Disease Research Resource Bank (GISB) was authorized as a Human Biospecimen Bank and Novel and Variant Pathogens Resource bank (NVPRB), enabling the integrated handling and distribution of both clinical specimens and pathogens.

GISB
Global Infectious Disease Specimen Bank

Main Entrance (ABSL3)


Laboratories (BSL3)


Breeding Room(ABSL3)

Liquid Nitrogen Freezer Room (Biobank)

Facility reservations for BSL3 and ABSL3, as well as bioresource search and distribution, are available through the official website.

- Web: rrc.ip-korea.org
- E-Mail: RRCS_team@ip-korea.org
- Biobank: GISB@ip-korea.org

International Cooperation

Institut Pasteur Korea (IPK) builds on its specialized expertise in infectious disease research and its accumulated scientific capabilities to work closely with leading research institutions and public health partners around the world. Through collaborative research and development efforts in infectious disease therapeutics and vaccines, IPK proactively addresses both existing and emerging infectious diseases, contributing to the advancement of global public health.

In particular, IPK expands its research exchange by focusing on global health challenges such as neglected diseases, infectious diseases associated with environmental and climate change, and antimicrobial resistance. As a responsible member of the global public health research network, IPK remains committed to advancing human health and promoting health equity worldwide.

DNDi

IPK and the Drugs for Neglected Diseases initiative (DNDi) aims to accelerate the discovery of new treatments for neglected tropical diseases (NTDs) such as leishmaniasis and Chagas disease. Additionally, DNDi & IPK are preparing for the next pandemic response by building a vast knowledge database of current therapeutic regimens across viruses with high epidemic potential including Influenza, Dengue, and Zika. Using our high-throughput screening, advanced assay models, and drug discovery expertise, IPK helps identify promising drug candidates, contributing to a strong pipeline of potential therapies for DNDi to advance into clinical development.

GARDP

IPK and the Global Antibiotic Research and Development Partnership (GARDP) are working on the discovery of new antibiotics by screening chemical libraries against bacterial pathogens that are classified as critical-level priorities. By leveraging their combined expertise and resources, GARDP and IPK aim to make significant advancements in the fight against antimicrobial resistance.

MMV Medicines for Malaria Venture

IPK announced on 18 that it has entered a research collaboration with Medicines for Malaria Venture (MMV), a Swiss not-for-profit organization, to support the development of new antimalarial therapeutics. Through this collaboration, the two institutions will initiate early-stage research utilizing IPK's high-content/high-throughput screening platform and plan to expand the partnership to encompass assay development, hit validation, and toxicity assessment across the full discovery cascade for antimalarial candidate molecules.

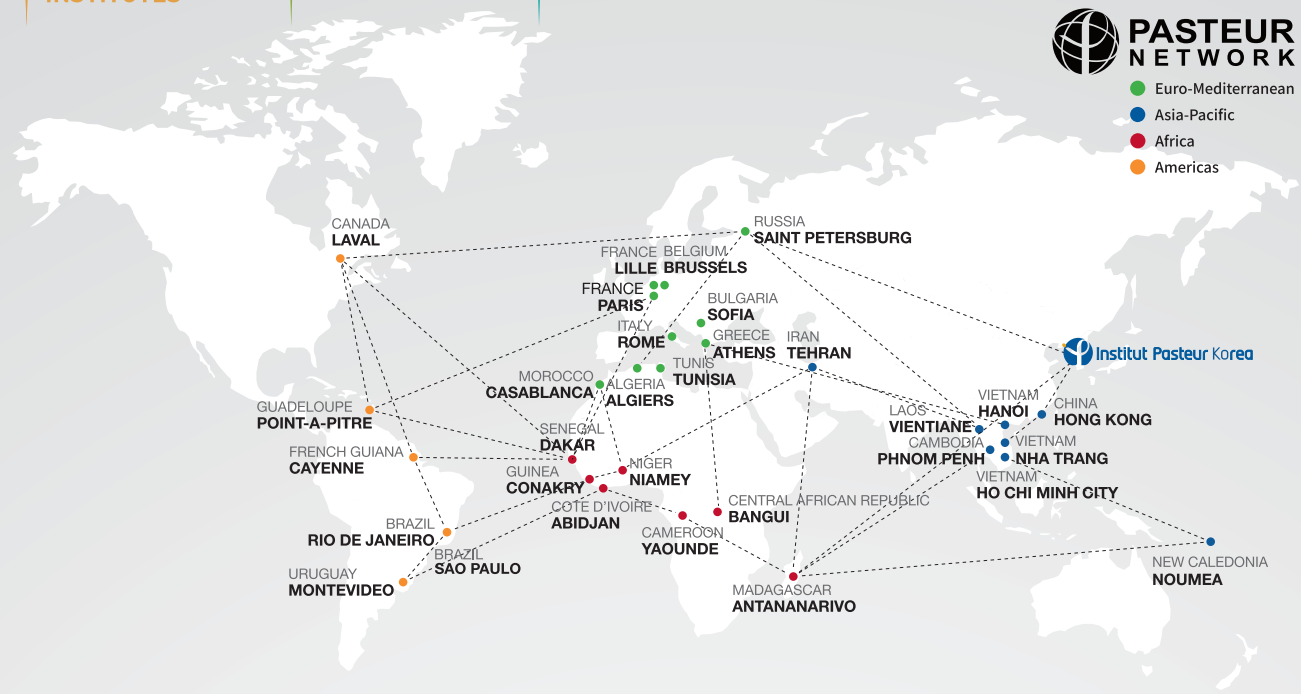
Pasteur Network

The Pasteur Network brings together 32 institutes located in 25 countries across five continents, united by the same missions, the same culture, and the same values. Leveraging vast human and scientific community, the Network is involved in international research projects, public health, teaching and training programs. For the past century, the Network has served as a sentinel for emerging infectious diseases in several endemic regions of the world, leveraging unique multidisciplinary cooperation in the field of human health by fighting against infectious diseases. By means of its diversity and global presence, the Pasteur Network aims to respond, in an innovative way, to international public health priorities.

32 MEMBER INSTITUTES

25 COUNTRIES

23000 PASTEURIANS



AMERICAS

Oswaldo Cruz Foundation (Fiocruz) (Rio de Janeiro)
INRS Armand-Frappier Santé Biotechnologie Research Centre (Laval)
Institut Pasteur de la Guadeloupe (Pointe-à-Pitre)
Institut Pasteur de la Guyane (Cayenne)
Scientific Platform Pasteur-USP (São Paulo)
Institut Pasteur de Montevideo

AFRICA

Pasteur Center in Cameroon (Yaoundé)
Cermes Niger (Niamey)
Institut Pasteur de Bangui
Institut Pasteur de Côte d'Ivoire (Abidjan)
Institut Pasteur de Dakar
Institut Pasteur de Guinée (Conakry)
Institut Pasteur de Madagascar (Antananarivo)

EURO-MEDITERRANEAN

Institut Pasteur in Italy - Cenci Bolognetti Foundation (Rome)
Hellenic Pasteur Institute (Athen)
Institut Pasteur de Lille
Institut Pasteur (Paris)
Saint-Petersburg Pasteur Institute
Sciensano (Brussels)
Stephan Angeloff Institute of Microliology (Sofia)
Institut Pasteur d'Algérie (Algiers)
Institut Pasteur du Maroc (Casablanca)
Institut Pasteur de Tunis

ASIA-PACIFIC

National Institute of Hygiene and Epidemiolgy (Hanoi)
Institut Pasteur du Cambodge (Phnom Penh)
Institut Pasteur Korea (Seoul)
Institut Pasteur in Ho Chi Minh City
Institut Pasteur du Laos (Vientiane)
Institut Pasteur in Nha Trang
Institut Pasteur de Nouvelle-Calédonie (IPNC) (Noumea)
University of Hong Kong -Pasteur Research Pole
Institut Pasteur in Iran (Tehran)

Human Resource Development

University of Science and Technology (UST) - IPK School

IPK School

IPK regularly recruits undergraduate interns in the life sciences, particularly in the field of infectious diseases.

'Advanced Drug Discovery & Development' is a field-oriented program that specializes in training global infectious disease experts, allowing them to acquire basic knowledge and innovative research methods for infectious diseases and cancers caused by new and variant viruses, resistant bacteria, and parasites, and to conduct a series of processes translating to the development of therapeutics using cutting-edge technologies.



High Content Screening (HCS) Training Course

IPK operates the HCS course in collaboration with Institut Pasteur and the Pasteur Network. The course provides a learning platform for those interested or working in chemical biology to interact and learn the best practices in setting up cell-based assays using automated microscopy, leading to the discovery of novel drugs.

This course is open to a broader audience, from newcomers to seasoned research scientists familiar with the technology and those seeking unbiased approaches to HCS and its application, such as small focused up to large scale drug screens.

Institut Pasteur Korea

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