

Research Areas and Assays

Research and Technology Areas

- Cellular assays for infectious disease models (Viruses, Bacteria, Parasites)
- Cellular assays for chronic disease models (Cancer, Neurodegeneration)
- Bioinformatics (OMICS data analysis, Molecular Modelling)
- High content phenotypic screening technology applied for drug and target screening
- Protein-protein interaction screening technology
- Small animal in vivo imaging technology

Phenotypic Assays: Example 2D and 3D Models



Assets

Chemical Libraries: ~ 500,000

► Pilot Screening: Proof of Concept

- Kinase Inhibitors
- Bioactives / NIH Clinical Collection
- FDA Approved drugs (~75% and growing)

► Full Scale Primary Screening: Unique pharmacological entities

- IPK diversity sets of small molecules (~330,000)
- Natural Products (~150,000)
- IPK Proprietary Compounds

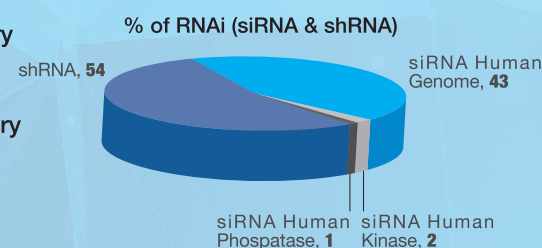
RNAi Libraries: ~ 20,000 genes

► Focused Libraries: Kinase / Phosphatase

► Full Human Genome-wide siRNA Library

► LentiExpress Human Kinases

► Full Human Genome-wide shRNA Library



Institut Pasteur Korea (IPK) was established in April 2004 in collaboration with Institut Pasteur in France and the Korean Ministry of Science and ICT (MSIT). IPK is a private, non-profit foundation with four core missions of public interests: Research, Education, Public Health, and International Collaboration. The member of IPK from over ten countries fulfill the "Pasteurian" mission of contributing to global public health by generating excellent basic research outcomes and translating them into treatment, prevention, and diagnosis strategies.



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Institut Pasteur Korea

Drug and Target Screening Platform

Introduction

Institut Pasteur Korea (IPK) is an international research institute focused on addressing global health issues with a combination of cutting edge approaches in order to understand disease mechanisms and develop new treatments. By promoting multi-disciplinary projects, IPK is at the forefront of drug discovery and contributes to Korea's future scientific resources through research, education and technological innovation.

Drug and Target Discovery Process

1

Discovery Biology

Develop disease models to define the cellular processes required during infection and gain a better understanding of disease mechanisms, in order to produce new therapies based on newly identified targets.

Areas of Research

- (Re)Emerging Viruses (SARS-CoV, SARS-CoV-2, MERS-CoV, Influenza)
- Vector-Borne Viruses (Zika viruses, Dengue)
- Oncogenic Viruses & Cancer (HBV, Liver Cancer)
- Parasites (Leishmaniasis, Malaria)
- Viral Immunology
- Anti-Microbial Resistance (Tuberculosis, Pseudomonas aeruginosa, Staphylococcus aureus, & Streptococcus pneumonias)

2

Core Technologies : Screening Science and Novel Assays

The core technology platforms are the key to our innovative approach of research and drug/target discovery. Cutting-edge phenotypic screening technologies are developed and applied to investigate the relationship between cell and pathogen. Our capabilities/assets include:

- Pathogen and Biological Research Conducted in Fully-Automated Screening Robotic Platforms Located in BSL-2+ and BSL-3 Laboratories
- Chemical Library Comprising ~500,000
- Genomic Platforms (siRNA and shRNA technology) to Identify New Targets and Signaling Pathways as well as Uncover Mechanism of Actions
- Technology Development
- Animal Facilities in SPF, ABSL-2+ and ABSL-3

Assay Development and Screening : Chemical and RNAi Screening Platform

IPK's integrated screening pathway employs dynamic robotic systems for high-throughput screening of chemical libraries and RNAi collections. IPK's next-generation drug discovery technology platforms, called 'phenomic technologies', combine advances from the latest bio-imaging techniques with high throughput screening technologies. This approach enables the real-time observation and analysis of cellular disease models in a high throughput mode. Using phenomic technologies, IPK can also identify previously unknown target genes associated with diseases and find new compounds that can serve as leads for innovative drug discovery.

3

Discovery Chemistry

Once promising lead compounds are identified, medicinal chemistry and animal research experts ensure their ex vivo and in vivo efficacy and safety.

Our areas of activity include:

- Lead Optimization
- Animal Test
- Early Safety Profiling
- Biobank
- Probe Molecules Development for Target ID
- Biomarker Probe Development

4

Industrial Partnerships

Institut Pasteur Korea works closely with industry and academia to transform discoveries into future technologies and new medications.

- Invention Disclosure
- Patent
- Consulting
- R&D Collaboration
- Intellectual Property
- Licensing

※ For more information on IPK's successful Industrial Partnerships, go to our website (www.ip-korea.org).

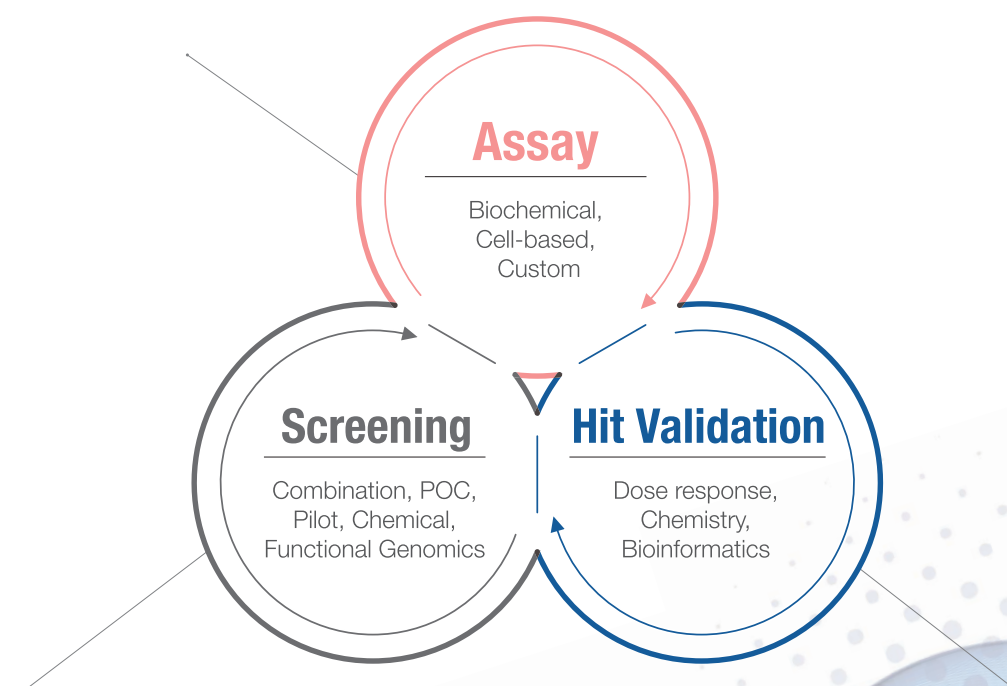
Screening Services

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.

1.1 Biochemical assays performed on multilabel plate readers include the 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, kinase 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