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Fuse Korean technology and Institut Pasteur know-how

Focus on translational research

The result? Faster, cheaper drug discovery

Welcome to
INSTITUT PASTEUR KOREA

*Our
Mission*



TURNING
BASIC
RESEARCH
INTO
PHARMACEUTICALS

A global center for **TRANSLATIONAL RESEARCH**

Genomics, imaging, bioinformatics and robotics are converging in remarkable ways. At the same time, progress in biology means that key features of many diseases can now be recapitulated in cell culture.

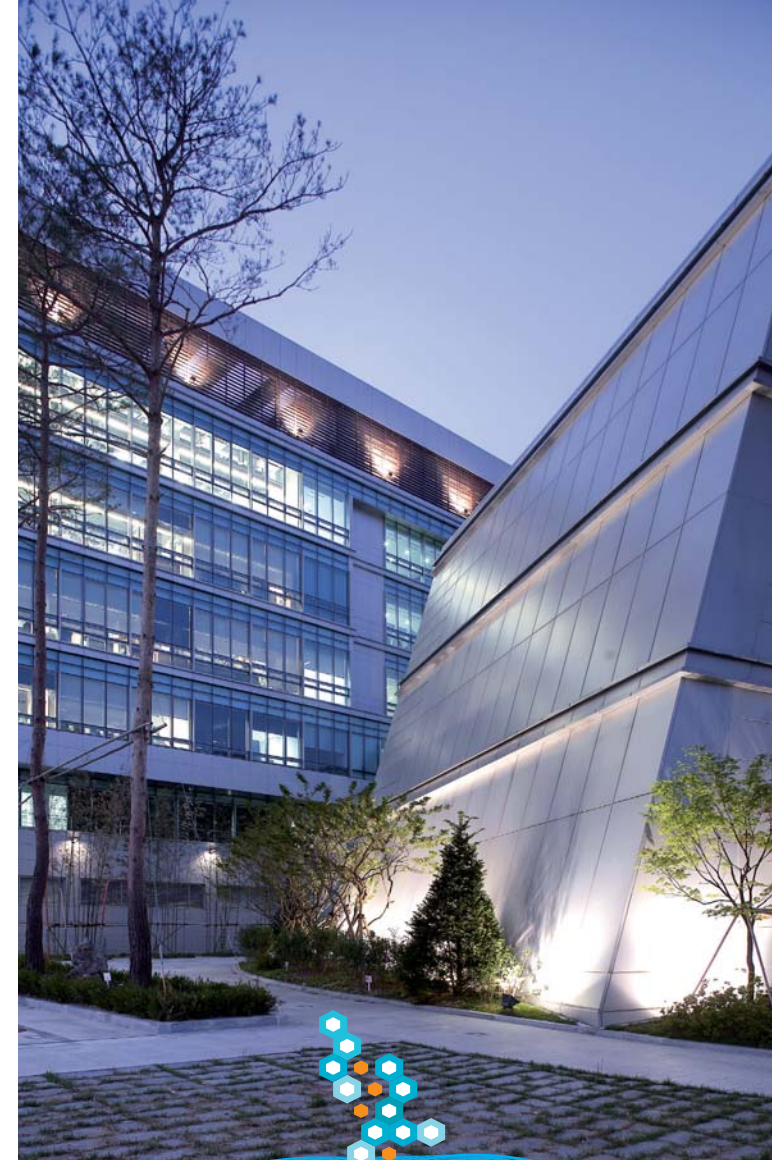


At Institut Pasteur Korea (IP-Korea), we've integrated these developments to create a new model of drug discovery. By screening genes and compounds for their impact on cell-based disease models, we can identify potential new medicines without knowing what their targets are. IP-Korea houses the world's only Evo-screen high throughput imaging system located in a Bio-safety level-3 laboratory, providing a unique research environment for high content screening of human infectious agents in living cells.

Our approach accelerates the drug discovery process, reduces its cost, opens the door to entirely new classes of drugs, and offers new insights into the mechanisms of disease.

Funding comes from the Korean Ministry of Education, Science and Technology (MEST) and the Gyeonggi provincial government. IP-Korea is designated as a translational research institute in the areas of infectious, neglected and chronic diseases.

Our scientific advisory board features leading scientists from around the world and our research and development partners include some of the world's largest pharmaceutical companies, most prominent international agencies, and most prestigious universities and research institutions.



IP-Korea is an international, non-profit research institute. We work in a stunning, purpose-built facility in Pangyo, just south of Seoul. The institute was founded in 2004 and is part of the international Pasteur network of 29 research institutes.

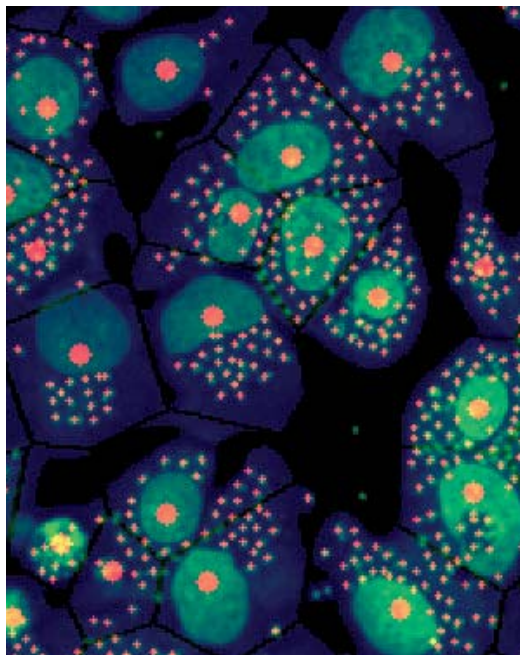


HOW WE WORK

UNIQUE
INTERDISCIPLINARY
APPROACH

IP-Korea unites molecular cell biologists, imaging specialists, medicinal chemists and biophysicists in the pursuit of new drug discovery and development technologies. Among the diseases we are tackling:

- HIV
- Tuberculosis
- Hepatitis C
- Chagas
- Dengue
- Malaria
- Leishmaniasis
- Melanoma
- Thrombosis
- Diabetes
- Alzheimer's



PhenomicScreen™ cellular model for Chagas disease after in house software analysis. In blue, host cell cytoplasm, in green, DNA – the small dots illustrate *Trypanosoma cruzi* DNA and large dots depict host cells' DNA.

Biology

Many diseases can be recapitulated in cell culture. Our program begins with teams of biologists who develop specific cellular disease models and adapt these for high throughput screening. Strong basic research programs in infectious diseases, neglected diseases and chronic diseases underlie this capability.

First steps to new drugs

IP-Korea's proprietary phenotype-based screening technology integrates robotics, image mining, miniaturized screening platforms, genomics and drug discovery. We can rapidly comb through millions of cell images to detect even subtle consequences of pathogenesis. Combining this with robotics creates



Cell Explorer located in Bio-safety level 2 facility

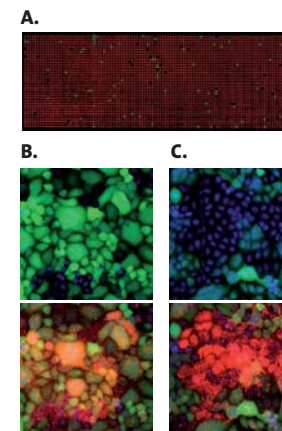
“phenomics” — the fully automated screening of cells for compounds and genes that alter cellular disease. Our PhenomicScreen™ quantifies biological events in living cells, in real time. It uses the cells themselves to identify the most effective drug target from millions of complex molecular interactions. And since the compounds are tested in cells, the targets are likely to be physiologically relevant, and toxic compounds are eliminated.

Hits to Leads

Once we have identified promising “hits”, our chemists turn them into more effective lead candidates. Lead selection and optimization using image-based assays systems is fast – the entire process can be completed in as little as 18 months.

Finding targets

Once we have a drug candidate, PhenomicID™, is used to identify the therapeutic target in the cell. This is done by assessing the impact of turning on or off all genes, one by one. Again we screen with live cell imaging technology - the entire human genome is represented by siRNAs on miniaturized glass slides. An entire, genome-wide, profile can be generated in just 8 hours.



A: A microarray used in genome-wide siRNA screens, each spot corresponding to a human gene. The genes are silenced in cells grown on the microarray, and we are interested in siRNAs that prevent expression of a GFP-tagged marker protein (shown in green). **B:** the green marker protein is expressed in the cells (top) with the RNAi spot shown in red (bottom). **C:** when the marker protein is inhibited, only blue labeled nuclei can be seen (top), with the RNAi spot in red (bottom).

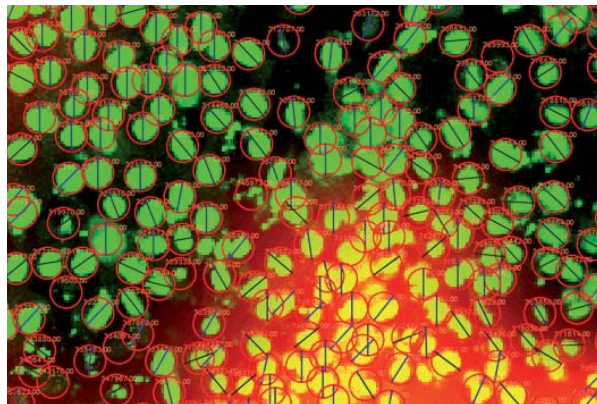
Opportunity Knocks:



TAKING THE FIGHT TO CHRONIC DISEASE, AND GENERATING NEW COLLABORATIONS

THE FUTURE

In 2008, the first patient-specific stem cell lines were announced. Now there are pluripotent human stem cell lines from people with over twenty different diseases.



Heterogeneous complex cell mixture requires specific imaging tools characterizing not only isolated cells phenotype but also the spatial interactions.

In 2010, we launched the Center for Chronic Disease to leverage IP Korea's technologies in chronic diseases such as cancer, cardiovascular diseases, diabetes and neurodegeneration. Using cellular models of pathogenesis, we will identify pathways involved and screen for drugs that halt disease progression. IP-Korea is also at the vanguard of screening technologies for complex mixtures of cells, such as samples from patients. These crucial technologies will be applied in the study of cancer stem cells, patient specific iPS cell models, cellular differentiation, and toxicology. The Centers for Infectious and Neglected Diseases will continue to develop new screens, targeting a wide range of infectious agents, from bacteria to viruses to parasites.

Commercial Potential

To realize the translational mission of IP-Korea, and to bring scientific discoveries closer to medical application, we work closely with Quro Science, a for-profit spin-off which is under shared management with IP-Korea. The tangible results and technologies that we generate are transferred to Quro Science, which drives drug development from preclinical research to clinical Phase II. Quro Science is a source of revenue for IP-Korea, back-financing excellent research in a non-profit setting.



Working with IP-Korea

We are actively seeking partners and collaborators in the following categories:

- Partnerships focusing on new disease areas with validated animal models
- Relationships built on innovative approaches to discover novel targets and/or compounds
- Joint risk-sharing on technology development through equity participation
- Fee-for-service arrangements on established technology
- Out-licensing compounds and/or targets

Teamwork

IP-Korea has alliances with leading academia, non governmental agencies, biotech companies and large pharmaceutical companies.

