

NEWS RELEASE

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Leading U.S. Bioscience Pioneers Enter International Collaboration with Government of Luxembourg to Accelerate Biomedical Research *International Public-Private Initiative to Drive Innovation in the U.S. and Overseas*

New York, June 6, 2008 – Three of the United States' most prominent biomedical science leaders have been tapped by the government of Luxembourg for an unprecedented international collaboration to establish a bioscience center of excellence in the heart of the European Union.

The government of the Grand Duchy of Luxembourg has announced an ambitious plan to increase the pace of innovation based on cutting-edge research in the areas of molecular biology, systems biology and personalized medicine. The initiative will include formation of a centralized biobank/tissue repository, two major projects to further research in the field of molecular biology, which is the cornerstone of personalized medicine, and a project to demonstrate the effectiveness of new diagnostics tests for earlier detection and treatment of lung cancer.

The U.S. organizations involved in the collaboration are: The Partnership for Personalized Medicine (PPM) led by Dr. Leland H. Hartwell, director, Nobel Laureate in Physiology or Medicine in 2001 and president of the Fred Hutchinson Cancer Research Center in Seattle, Washington; The Institute for Systems Biology (ISB), also in Seattle, led by Dr. Leroy Hood, president of ISB and co-founder of U.S.-based Amgen Inc.; and Arizona's Translational Genomics Research Institute (TGen), led by Dr. Jeffrey Trent, president and scientific director of TGen and former scientific director at the National Human Genome Research Institute of the National Institutes of Health.

The announcement was made jointly by three branches of Luxembourg's government, the Ministry of the Economy and Foreign Trade, the Ministry for Culture, Higher Education and Research and the Ministry of Health. The Luxembourg government is investing more than \$200 million in the initiative, with the hope that ultimately it will improve the health of its own people by increasing the ability to administer the right drug to the right patient at the right time and in the right dose. In addition, it seeks to accelerate the global pace and integration of biomedical research, education and commercial development around the world.

The public-private initiative is expected to serve as a model for other international collaborations among partners looking to not only share research and development costs but also to gain access to each other's information, networks and markets. The Luxembourg collaboration was developed and negotiated in consultation with the global professional services organization, PricewaterhouseCoopers, and is built on an integrated approach that links research, education, healthcare and the economy.

The collaboration consists of three interrelated research initiatives that build on each other. They include:

Build the Integrated BioBank of Luxembourg (IBBL)

Led by TGen, Luxembourg will launch the Integrated BioBank of Luxembourg, which has the promise of becoming a premier European hub for advanced biobanking, biotechnology and biomedical informatics.

Biobanks are invaluable in bridging the gap between the pace of scientific and technological advancement and translation to clinical benefit. Most existing European and U.S. biobanks focus on simple collection and redistribution of specimens to scientists and educators. The IBBL will implement uniform standards for collection, storage and redistribution of an anticipated full range of tissue samples (e.g. blood, serum and tumor tissue). However, the added value of this next-generation biobank will be the detailed, centralized, molecular-based characterization of biospecimens, which over time (and

ultimately linked to detailed clinical information) will lead to amassing an extensive database of medically relevant information.

The project will unite and leverage expertise in biology, pathology, informatics and information technology infrastructure, laboratory operations, transportation, legal matters and ethics.

Accessible to European and international colleagues, IBBL will maintain its collection of tissues in a research environment that will seek collaborations broadly within the wider research community. As such, the IBBL will serve as a centralized resource for sharing and comparing research results through a robust, scalable and secure bioinformatics system that supports the collection, processing, storage, annotation and distribution of biospecimens and data.

TGen's principal role working with Luxembourg scientists and physicians will be to jointly develop and implement the next generation of molecular medicine through the development of the information architecture and technology implementation.

Create the Center for Systems Biology Luxembourg (CSBL)

The Institute for Systems Biology will collaborate with the University of Luxembourg to create the Center for Systems Biology Luxembourg. The Center will participate with ISB on two basic research projects designed to provide greater insight into the identification of disease and to enable more effective treatments:

- ISB Research Project 1: The first project will include completion of a personalized human genome sequencing map on a minimum of one hundred subjects and development of new methods for understanding the role of genetic variations in disease, leading to new insights into diagnosis, treatment and prevention.
- ISB Research Project 2: The second project is development of integrated systems proteomics, RNA and cell analysis methodology and tools based on ISB's groundbreaking discovery of protein blood "fingerprints" and single-cell characteristics that can report on the physiological state of the body's 50 major organs. The research promises to lead to powerful early diagnostic approaches to not only treat but also predict disease and the ability to monitor the effects of existing drugs, including both effective responses or adverse reactions.

ISB's role will be to apply its systems biology approaches and tools to study model organisms such as mice to determine how best to interrogate and analyze human genetic data at the DNA sequence level. New computational and mathematical tools will be developed to facilitate these large-scale genome analyses and to integrate these insights with protein blood fingerprints.

Launch the Luxembourg Project Lung Cancer

The goal of Luxembourg Project Lung Cancer is to advance research in personalized medicine by pursuing research projects to develop molecular diagnostics for specific disease. These research projects center on the selection and validation of biomarkers to more effectively diagnose and manage disease from early detection through therapeutic follow-up.

The Luxembourg project will focus specifically on lung cancer for which there are no reliable tools for early detection and for patients with advanced disease with virtually no known cures. The project also will seek to demonstrate that earlier detection and intervention can reduce healthcare costs. The initiative capitalizes on the efforts of the U.S.-based Partnership for Personalized Medicine (PPM), led by Dr. Hartwell, and will develop use of new personalized, protein-based diagnostic tools.

The Partnership will unite the efforts and capabilities of investigators at TGen and the Biodesign Institute at Arizona State University, as well as the Fred Hutchinson Cancer Center in Seattle. Over time this effort is expected to link to a host of other research institutions and initiatives in the U.S. and beyond.

Personalized medicine focuses on improved prevention, targeted screening, early diagnosis and treatment of the causes of illness with drugs based on an individual's genetic and biological make-up, such as drugs targeted and suited to each patient. It is believed that personalized medicine will gradually take the place of conventional medicine. Ultimately, this will result in great improvements in the ability to administer the right drug to the right patient at the right time and in the right dose.

About the Institute for Systems Biology

Founded in 2000, the Institute for Systems Biology (ISB) is an internationally renowned, non-profit research institute headquartered in Seattle and dedicated to the study and application of systems biology. Founded by Leroy Hood, Alan Aderem and Ruedi Aebersold, ISB seeks to use systems methods to unravel the mysteries of human biology and identify strategies for predicting and preventing diseases such as cancer, diabetes and AIDS. ISB's systems approach integrates biology, computation and technological development, enabling scientists to analyze all elements in complex biological systems rather than one gene or protein at a time. For more information about ISB, visit www.systemsbiology.org.

About the Partnership for Personalized Medicine

The Partnership for Personalized Medicine is a major healthcare research initiative that unites contributions from two leading Arizona-based philanthropic organizations: the Virginia G. Piper Charitable Trust and the Flinn Foundation with leadership and research capabilities from Fred Hutchinson Cancer Research Center, the Translational Genomics Research Institute and the Biodesign Institute at Arizona State University.

About Fred Hutchinson Cancer Research Center

At Fred Hutchinson Cancer Research Center, interdisciplinary teams of world-renowned scientists and humanitarians work together to prevent, diagnose and treat cancer, HIV/AIDS and other diseases. Hutchinson Center researchers, including three Nobel Laureates, bring a relentless pursuit and passion for health, knowledge and hope to their work and to the world. For more information, visit www.fhcrc.org.

About the Biodesign Institute at Arizona State University

The Biodesign Institute at ASU integrates diverse fields of science to cure and prevent disease, overcome the limitations of injury, renew the environment and improve national security. By fusing research in biology, engineering, medicine, physics, information technology and cognitive science, the institute accelerates discoveries into uses that can be adopted rapidly by the private sector. For more information, visit www.biodesign.asu.edu.

About TGen

The Translational Genomics Research Institute (TGen) is a non-profit organization dedicated to conducting groundbreaking research with life changing results. Research at TGen is focused on helping patients with diseases such as cancer, neurological disorders and diabetes. TGen is on the cutting edge of translational research where investigators are able to unravel the genetic components of common and complex diseases. Working with collaborators in the scientific and medical communities, TGen believes it can make a substantial contribution to the efficiency and effectiveness of the translational process. For more information about TGen, visit www.tgen.org.

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For additional information, contact:

For US organizations:

Lisa Stearns, The Hubbell Group, Inc., 781-878-8882, lstearns@hubbellgorup.com
Constance Hubbell, The Hubbell Group, Inc. 781-878-8882, Hubbell@hubbellgroup.com

For Luxembourg Government

Judith Meyers, Ministry of Economy and Foreign Trade, + 352 24 78 43 49, judith.meyers@eco.etat.lu