

Personalized medicine initiative targets lung cancer

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A U.S.-based personalized medicine initiative led by scientists from the Biodesign Institute, Translational Genomics Research Institute (TGen) and Seattle's Fred Hutchinson Cancer Research Center has secured its first major international collaboration with the government of Luxembourg.

The Partnership for Personalized Medicine, formed last fall with funding support from the Virginia G. Piper Charitable Trust and Flinn Foundation, will explore the development of novel diagnostics for lung cancer.

The goal of the Luxembourg lung cancer project is to advance research in personalized medicine by pursuing research projects to develop molecular diagnostics for specific diseases. 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 focus on lung cancer came to the forefront of our efforts because it is currently the leading malignancy," says George Poste, director of the Biodesign Institute. "To make the greatest impact, it is imperative that we find diagnostic markers that can more accurately predict the success of treatment regimens for improved patient care and outcomes."

Poste notes that lung cancers are notoriously difficult to treat, with most patients failing to respond to their first therapeutic regimen, resulting in

highly expensive (\$40,000-100,000 each) treatments with an initial success that can be as low as one out of every 10 patients – and, in best-case scenarios, 40 percent.

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 health care costs. The initiative capitalizes on the efforts of the U.S.-based Partnership for Personalized Medicine (PPM), led by Fred Hutchinson Cancer Center director and Nobel laureate Lee Hartwell, and will develop use of new personalized, protein-based diagnostic tools.

“This is a tremendous first step, and it’s exactly the right kind of project,” says ASU President Michael Crow.

Crow says he believes that, if the project succeeds, it is a formula that can be repeated for other diseases, and an important demonstration of the type of “leapfrog strategy” that can help Arizona establish itself in the 21st century economy.

The cornerstone of the partnership is the creation of the Virginia G. Piper Center for Personalized Diagnostics that draws upon the scientific strengths of the state’s leading bioscience entities: the Biodesign Institute and TGen.

Biodesign’s role will primary focus on using state-of-the-art instrumentation such as mass spectrometry and bioinformatics approaches to analyze novel proteins expressed in lung cancer. The emphasis on identifying peptides and proteins that could be detectable in the blood stream will allow for earlier detection of this devastating

disease.

In addition, identification of abnormal peptides may aid other cross-collaborative institutional efforts such as identifying potential immunization antigens for use in Biodesign colleague Stephen Johnston's cancer vaccine project. Last year, Johnston received a \$7 million award from the Department of Defense to develop a prophylactic cancer vaccine in collaboration with Mayo Clinic Arizona.

The lung cancer initiative was part of the government of the Grand Duchy of Luxembourg's ambitious plan to increase the pace of innovation based on cutting-edge research in the areas of molecular biology, systems biology and personalized medicine.

This plan 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 collaboration consists of interrelated research initiatives that build on each other. They include the Partnership for Personalized Medicine (PPM) led by 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 Leroy Hood, president of ISB and co-founder of U.S.-based Amgen Inc.; ASU's Biodesign Institute, led by Poste; and the Translational Genomics Research Institute (TGen), led by 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 public-private initiative is expected to serve as a model for other

international collaborations among partners looking to share research and development costs and 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, health care and the economy.

“We thank the foresight and leadership demonstrated by the Luxembourg government,” Poste says. “This model may serve as a driving force of innovation for the European Union, as well as U.S. health care.”

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.

Source: Arizona State University

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