

University of Pittsburgh Announces the Creation of a Program to Create Therapeutics and Diagnostics for Metastatic Breast Cancer Based on Quantitative Systems Pharmacology (QSP) for Personalized Medicine

Pittsburgh, February 11, 2014. The University of Pittsburgh Drug Discovery Institute (UPDDI) and the Women's Cancer Research Center (WCRC) of the University of Pittsburgh Cancer Institute (UPCI), Magee-Womens Research Institute (MWRI) and the Institute of Personalized Medicine (IPM) announced today the creation of a program to create therapeutics and diagnostics aimed at metastatic breast cancer using the tools of quantitative systems pharmacology (QSP).

Despite tremendous advances in the treatment of early breast cancer, women face an ongoing risk of relapse for an indefinite length of time. While over 90% of breast cancer deaths are related to metastatic disease, studies have largely focused on mechanisms of cancer initiation and progression. A QSP approach that combines computational and experimental methods will be applied in the investigations. An unbiased and comprehensive molecular profiling of paired tumors (primary and metastatic) will help identify what drives breast cancer growth and metastasis, and identify why some breast cancers produce life-threatening metastases. Systems biology and functional genomics will identify drivers and dependencies of breast cancer growth and metastasis, which will be targeted with rationally-designed combinations of novel, as well as known (re-purposed) drugs. Finally, we expect that our studies of primary and metastatic disease will provide novel insight into the challenge of determining why/how breast cancer cells lay dormant for years and then re-emerge (recurrence). The team will initiate the program by taking advantage of data that suggests the involvement of mutations in the estrogen receptor in the metastatic tumors. This "biased approach" of QSP will be pursued while the paired tumor molecular profiling is in progress. The metastatic breast cancer program will involve collaborations between faculty at Pitt, as well as collaborations with other academic leaders, federal agencies and industry.

"The implementation of QSP for personalized medicine is expected to increase the likelihood of discovering novel therapeutics and diagnostic tests for metastatic breast cancer" stated D. Lansing Taylor, Director of the UPDDI.

"I am delighted to see this interdisciplinary collaboration between so many parts of the University begin to take shape. As a medical oncologist specializing in treatment of women with breast cancer, I am pleased to see this new effort to focus on the needs of the 40,000 women who develop and ultimately died from advanced breast cancer each year." said Dr. Nancy E. Davidson, Director of the University of Pittsburgh Cancer Institute and UPMC Cancer Center.

"The foresight and investment in tissue banking by Pitt and UPMC has given us a unique opportunity to find new therapies and diagnostics for this devastating disease" stated Adrian Lee, Director of the WCRC and MWRI. "This work wouldn't be possible without the team effort by investigators from such diverse disciplines".

About the University of Pittsburgh School of Medicine:

As one of the nation's leading academic centers for biomedical research, the University of Pittsburgh School of Medicine integrates advanced technology with basic science across a broad range of

disciplines in a continuous quest to harness the power of new knowledge and improve the human condition. Likewise, the School of Medicine is equally committed to advancing the quality and strength of its medical and graduate education programs, for which it is recognized as an innovative leader, and to training highly skilled, compassionate clinicians and creative scientists well-equipped to engage in world-class research. The School of Medicine is the academic partner of [UPMC](#), which has collaborated with the University to raise the standard of medical excellence in Pittsburgh and to position health care as a driving force behind the region's economy. For more information about the School of Medicine, see www.medschool.pitt.edu.

About the UPDDI:

The University of Pittsburgh Drug Discovery Institute has implemented Quantitative Systems Pharmacology (QSP) as a major theme in developing therapeutics and companion diagnostics for many disease areas, but with a focus on cancer, neurodegenerative diseases and infectious diseases. The UPDDI integrates investigators from many fields in academia and industry including disease biology, computational and systems biology, chemistry and medicinal chemistry to pursue a powerful and cost-effective path to discovery and development, see www.upddi.pitt.edu.

About the WCRC of the UPCI:

The Women's Cancer Research Center (WCRC) is a collaboration between the University of Pittsburgh Cancer Institute (UPCI) and the Magee-Womens Research Institute (MWRI). The mission of the WCRC is to reduce the incidence and death from women's cancer. This mission is achieved through the development and fostering of vibrant basic, translational, and clinical research aimed at translating novel discoveries into improved patient care, see www.upci.upmc.edu/wcrc.

About the IPM:

The Institute of Personalized Medicine (IPM) was founded at the University of Pittsburgh in January 2013. The mission of the IPM is harvest data from modern technologies including but not limited to genomic sequencing to aid in diseases prevention and treatment to the benefits of both individuals and society.