Gordon B.Mills, M.D., Ph.D.
2013 Susan G. Komen®
Brinker Award for Scientific Distinction in Basic Science

Gordon B. Mills, M.D., Ph.D. is being honored for his significant contributions to breast cancer research, which have been essential to advancing our understanding of the key processes that drive breast cancer's initiation, progression and response to therapy. Dr. Mills has championed a cancer systems biology approach to understand the impact of genomic aberrations on complex signaling networks at the proteomic (protein) level, with the goal of individualizing cancer diagnosis and treatment.

Dr. Mills has characterized a number of molecules and signaling pathways that are key to breast cancer cell survival, growth and propensity to metastasize. He has studied lysophospholipids, specifically the membrane-derived lipids, lysophosphatidic acid (LPA) and sphingosine 1 phosphate (S1P), and uncovered their role in controlling breast tumorigenesis, invasion, and metastasis. Dr. Mills and his colleagues have made seminal observations about the effects of aberrations in the phosphatidylinositol 3 kinase (PI3K) pathway on breast cancer, which may help to identify patients who would benefit most from drugs targeting specific nodes in this pathway.

Dr. Mills' team studies the effect of genomic aberrations in cancer cells in the context of interconnected and interacting pathways to identify rational approaches to combinatorial therapy of cancer. In order to determine which genomic aberrations in patient tumors are drivers or passengers and thus therapeutic targets, Dr. Mills has established a high throughput functional genomics program aimed at determining the therapeutic liabilities engendered by specific mutations in cancer genes. Dr. Mills and his collaborators are also implementing -omic technology to follow the evolution of tumor cells when exposed to different therapies in an effort to understand how tumor cells become resistant and to develop rational combination approaches to bypass and prevent the emergence of drug resistance. Together, his work is advancing personalized medicine, in which treatments are tailored based on genomic and epigenetic aberrations that drive each patient's cancer.

With support from Susan G. Komen®, he has extended the utility of Reverse Phase Protein Arrays (RPPA) to characterization of the breast cancer proteome. His team has led the Cancer Genome Atlas' proteomic profiling of breast and other epithelial tumors and identified new subtypes of breast cancer that had not been identified through genomic analyses. He has made the RPPA approach and data available to research community providing a powerful functional proteomics resource.

Dr. Mills received his M.D. and his Ph.D. in biochemistry and completed his training in Obstetrics and Gynecology at the University of Alberta. His post-doctoral training was in immunology at the Hospital for Sick Children in Toronto. After his training, he joined the faculty at the University of Toronto where he served as the director of Oncology Research and rose to the rank of Associate Professor. Dr. Mills was recruited to The University of Texas M. D. Anderson Cancer Center in 1994, where he established and chairs the Department of Systems Biology. He holds the Wiess Distinguished University Chair in Cancer Medicine and is director of the Kleberg Center for

Molecular Markers and co-director of the Sheikh Khalifa bin Zayed Al Nahyan Institute for Personalized Cancer Therapy.

Dr. Mills' dedication to mentorship, collaboration and team science have positively impacted the breast cancer research community. His research efforts and advocacy have made it possible to implement more personalized therapies for breast cancer patients. His innovation, visionary ideas and expertise are invaluable to breast cancer research and his ongoing investigation, technological developments and contributions of his trainees and collaborators will continue to impact the field for years to come.