



# Investigator Hall of Fame



## Robert A. Weinberg, Ph.D.

Massachusetts Institute of Technology

Professor of Biology, Director of the Ludwig Center for Molecular Oncology,  
Founding Member of the Whitehead Institute for Biomedical Research

*"If we understand the root cause of a disease, we will gain great insight into how to treat it."*

-Dr. Weinberg

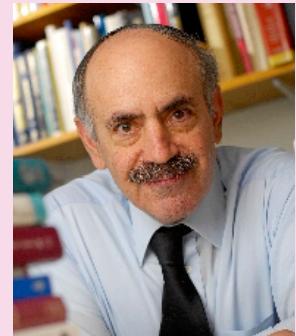
Highly respected for his 'game-changing' discoveries about the biology of cancer, Robert Weinberg, Ph.D. has been changing the way we think about breast cancer since the late 1970s. Dr. Weinberg not only isolated the first human cancer-causing gene, the ras oncogene, but discovered the first tumor suppressor gene as well, the retinoblastoma gene. His lab demonstrated that subtle errors could completely disrupt the delicate balance between normal cell function and cancer. These discoveries revolutionized thinking about the disease and changed the dialogue about cancer's origins -- the result of errors in the genetic machinery of cells. Since these early discoveries, literally hundreds of other oncogenes and tumor suppressor genes have been discovered, paving the way for novel therapies.

Dr. Weinberg remembers when he discovered a new gene that would eventually revolutionize our understanding of breast cancer. "We studied that gene and the protein it made and five years later it was discovered to be over-expressed... and that became the HER2 gene." This basic discovery led others to further study the gene and the development of Herceptin (trastuzumab). The first drug of its kind, Herceptin works by attaching to the HER2 proteins on cancer cells, turning off their growth signals and making the cancer cells more vulnerable to chemotherapy. Most importantly, HER2-targeted therapies have significantly improved survival for women with HER2-positive breast cancer, which accounts for approximately 25% of all new cases.

Today, Dr. Weinberg is seeking to understand the cellular and molecular processes of the 'invasion-metastasis' cascade, the series of steps that allow cancer cells to spread throughout the body and seed new cancers. Dr. Weinberg reveals that the next steps of his research will "focus on cancer stem cells, how they arise and how we can eliminate them... We can see a clear path of experimental advance and I'm anxious to move forward."

Dr. Weinberg is a firm believer in sustaining the field of basic breast cancer research. "Without understanding the basic mechanisms that cause breast cancer," he says, "our ability to develop innovative treatments for the disease in the future will be limited." One important way to do this is by cultivating young, new scientists to continue to search for the cures. Dr. Weinberg spends a significant amount of time mentoring trainees, many of whom have been supported by Komen grants.

Dr. Weinberg's enthusiasm for his work is nearly palpable and he credits Susan G. Komen for the Cure with sharing in his passion saying, "Komen has been very understanding, saying to us in effect 'we want you to work in this general area but if you find something new and exciting, then please go and pursue it in the context of breast cancer research with our blessing'."



### Professional Accolades

- 1982 - Discover Magazine Scientist of the Year
- 1984 - Bristol-Myers Award for Distinguished Achievement in Cancer Research
- 1997 - National Medal of Science
- 2004 - Wolf Prize in Medicine
- 2007 - Otto Warburg Medal
- 2008 - Landon-AACR Prize for Cancer Research

### Komen Funded Research

- 1992 - \$30,000 - Regulation of the Rb-E2F Complex
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- 1995 - \$105,000 - Estrogen Receptor-Mediated Regulation of Mammary Epithelial Cell Cycle
- 2004 - \$250,000 - Origins of Mammary Tumor Stromal Cells
- 2009 - \$180,000 - Influence Of Cancer Stem Cell On Non-stem Cancer Cell: Growth, Metastasis And Stemness