Bankhead-Coley Cancer Research Program

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Medicine
University of Miami

2009 Program
Specialized Programs of Research Excellence
(2-year project)

Project Title: Novel Experimental Therapeutic Approaches to Breast Cancer Therapy

Project Summary: Basic scientists and medical doctors join forces in this grant to find new ways of blocking growth-promoting effects of estrogen, growth factor signaling pathways, and the tumor's blood supply, all of which are key to a breast cancer's survival and growth. We will test new smart bombs that can specifically block pathways activated in cancers and not in normal cells, killing the cancer but leaving normal cells unharmed. Four research groups will tackle molecular causes underlying different forms of breast cancer. Projects 1 and 2 investigate causes of aggressive estrogen receptor (ER) negative breast cancers that often affect young women and test if blocking pathways that degrade the ER might allow ER negative to become ER positive, thus making them susceptible to antiestrogen therapies.
HER2 is a growth promoting receptor that is overexpressed in up to 30 percent of breast cancers and can be targeted by antibodies to block tumor growth. Project 3 will develop and test a new drug that combines antibody blockade of HER2 with a drug that blocks tumor blood vessel growth. This drug may prove to be better than trastuzumab (Herceptin), not only blocking HER2 in cancers that have high HER2 levels but also in cancers that only weakly express HER2 or have become trastuzumab resistant. Finally, Project 4 tests how estrogen causes breast cancer growth by turning on a transcription factor, GREB1, and will find and test new small molecule drugs that could turn off GREB1 and shut off growth of the most common form of breast cancer, namely ER positive cancer. These teams aim to define molecular patterns in the tumor that predict who will respond to treatment so that treatment can be individualized for maximum efficacy.