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Researcher Awarded \$1.6 Million to Investigate Tumor Suppressor's Role in Breast Cancer
Scientist at The Cancer Institute of New Jersey Receives Grant from National Cancer Institute

New Brunswick, N.J., July 17, 2009 – Studies have estimated that five to ten percent of breast cancer cases in the United States are linked to inherited mutations, the most common of which are changes in the *BRCA1* or *BRCA2* genes. Defects in those genes significantly increase a woman's chance of getting breast cancer. Aiming to help unlock the mysteries of that critical genetic pathway is Bing Xia, PhD, a scientist at The Cancer Institute of New Jersey (CINJ), who was just awarded \$1.6 million from the National Cancer Institute (NCI), a division of the National Institutes of Health. CINJ is a Center of Excellence of UMDNJ-Robert Wood Johnson Medical School.

The R01 award will support the work of Dr. Xia, an assistant professor of Radiation Oncology and Pharmacology at UMDNJ-Robert Wood Johnson Medical School, on the functions of *PALB2*, another gene that has a critical function in the same tumor suppression pathway.

BRCA1 and *BRCA2* proteins (which are products of the *BRCA1* and *BRCA2* genes that carry out their functions) are essential to the maintenance and repair of DNA -- the material that makes up one's genes. These proteins also play important roles in controlling cell growth, particularly after DNA damage. These functions are considered critical to preventing normal cells from becoming cancer cells. Therefore defects in *BRCA1* or *BRCA2* proteins result in approximately a ten-fold increase of lifetime breast cancer risk. Cancer cells that have non-functional *BRCA1* and *BRCA2* proteins are unable to repair certain types of DNA damage. Scientists hope to exploit such vulnerability through the use of specifically tailored drugs to kill off such cancer cells.

In recent years, Xia and colleagues have discovered that the novel protein *PALB2* serves as a major partner of the *BRCA2* protein and that it is required in *BRCA2* DNA damage response function. By virtue of this essential role in supporting the function of the *BRCA2* "tumor suppressor," *PALB2* appears to be a tumor suppressor in its own right, according to Xia. He and others have demonstrated that inherited defects in *PALB2* cause heightened risk of breast cancer, just as in the case of *BRCA2*. Xia's team also recently found that *PALB2* also binds the other commonly known breast cancer protein *BRCA1*, and does so in a way that links the two major breast cancer proteins to form a central breast cancer suppression pathway.

In the current project Xia's team will dig deep into the inner working mechanisms by which *PALB2* operates in the cell to support *BRCA2* function and connect the two *BRCA* proteins in DNA repair and cell growth control. They also will generate mouse models of *PALB2*- and *BRCA2*-associated breast cancer to study the path of breast cancer development and the characteristics of the tumors.

Xia says he is grateful to the NCI for its support and hopes that the results of the study could have a wide-ranging impact. "This research has the potential to yield critical insights into the origin and development of familial breast cancer, and may also shed light on the development of breast cancer in general," he said. "The results and tools generated from this study may also contribute to the rational design of new breast cancer drugs and treatment strategies."

The five-year award period runs through June 30, 2014.

About The Cancer Institute of New Jersey

The Cancer Institute of New Jersey (www.cinj.org) is the state's first and only National Cancer Institute-designated Comprehensive Cancer Center, and is dedicated to improving the prevention, detection, treatment and care of patients with cancer. CINJ's physician-scientists engage in translational research, transforming their laboratory discoveries into clinical practice, quite literally bringing research to life. The Cancer Institute of New Jersey is a Center of Excellence of UMDNJ-Robert Wood Johnson Medical School. To support CINJ, please call the Cancer Institute of New Jersey Foundation at 1-888-333-CINJ.

The Cancer Institute of New Jersey Network is comprised of hospitals throughout the state and provides a mechanism to rapidly disseminate important discoveries into the community. Flagship Hospital: Robert Wood Johnson University Hospital. Major Clinical Research Affiliate Hospitals: Carol G. Simon Cancer Center at Morristown Memorial Hospital, Carol G. Simon Cancer Center at Overlook Hospital, and Jersey Shore University Medical Center. Affiliate Hospitals: Bayshore Community Hospital, CentraState Healthcare System, Cooper University Hospital*, JFK Medical Center, Raritan Bay Medical Center, Robert Wood Johnson University Hospital at Hamilton (CINJ at Hamilton), Saint Peter's University Hospital, Somerset Medical Center, Southern Ocean County Hospital, The University Hospital/UMDNJ-New Jersey Medical School*, and University Medical Center at Princeton. *Academic Affiliate

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