



## **Mina Bissell, Ph.D., Receives 2012 AACR Distinguished Lectureship in Breast Cancer Research**

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PHILADELPHIA — The American Association for Cancer Research is pleased to announce that Mina J. Bissell, Ph.D., distinguished scientist at Lawrence Berkeley National Laboratory, is the recipient of the 2012 AACR Distinguished Lectureship in Breast Cancer Research.

The lectureship, which is supported by Bristol-Myers Squibb, was established in 2008 and is given annually to an individual who has undertaken outstanding scientific research that has inspired or has the potential to inspire new perspectives on the etiology, diagnosis, treatment or prevention of breast cancer.

Bissell will deliver her award lecture, titled “Genes and the Microenvironment: The Twosome of Gene Expression and Breast Cancer,” on Friday, Dec. 7, 2012, during the 35th Annual CTRC-AACR San Antonio Breast Cancer Symposium, which will be held at the Henry B. Gonzalez Convention Center in San Antonio, Texas.

“I’m very grateful to receive this award,” said Bissell. “It means a lot to be recognized by my colleagues with these prestigious accolades. For years my research focus was very different from what many others were excited about. I feel my being honored with such high-profile awards shows that my ideas are being accepted, and signals to young researchers that if they are passionate about their work, they should persist, following their intuition and results wherever these may take them, not necessarily where the current thinking dictates.”

Bissell’s innovative breast cancer research has had a profound effect on our understanding of cancer biology, in particular how three-dimensional organ architecture is responsible for normal behavior and how the loss of this crucial information influences the genesis of tumors. Her work ultimately demonstrated the pivotal role of reciprocal signaling between the nucleus and the extracellular matrix that surrounds tissues. She argued that it is the imbalance of this dynamic exchange of information that causes cancer. She was doing this work at a time when most cancer researchers were focusing on single mutated genes as being necessary and sufficient for tumor formation. The data generated by Bissell and her team over several decades indicate that it is not

just what goes wrong inside the nucleus (the genetic mutations) that drives cancer, but also disruption of microenvironmental control.

Bissell has long been interested in understanding how cells know what to do. “The alphabet of genes is the same in every cell in our body, but cells in each tissue do different jobs; how do they know what to do?” she said.

The answer is, their microenvironment tells them. For example, Bissell and colleagues showed cells taken from the skin or the breast and placed in a plastic dish lose their identity, but if they are placed in the right three-dimensional microenvironment they remember where they came from and regain skin or breast cell characteristics.

“I like to say that there is wisdom in each organ, in the skin and in the breast,” she said. “Each tissue knows how to form and what to do. It isn’t that genes are not important, they are essential, but the tissue microenvironment integrates everything to provide genes with directions.”

What is true for normal cells in a tissue is also true for tumor cells of that tissue – cells harboring cancer-driving genetic mutations. The team showed that tissue architecture provides cancer-driving genes with instructions. Furthermore, in three-dimensional cultured cells and in animals, breast cancer cells harboring tumor-driving mutations can be induced to behave normally if their microenvironment is restored to normal. Whether this is true in humans and could be exploited therapeutically is now being explored.

Bissell has authored more than 350 scientific publications, advancing our knowledge of the normal mammary gland and breast cancer. Recently elected a member of the U.S. National Academy of Sciences, she is also a member of the Institute of Medicine (1997) and other honorary societies. She has received numerous awards for original research, including other AACR awards such as the Clowes Memorial (1999) and the Pezcoller/AACR awards, the American Cancer Society Medal of Honor for Basic Research in 2008 and most recently the 2011 Jill Rose Award of the Breast Cancer Research Foundation. She has been and continues to be a member of numerous editorial boards, and serves on many international and national review boards and committees.

Bissell earned a bachelor’s degree from Harvard University and a doctorate in microbiology and molecular genetics from Harvard Medical School, and was director of all life sciences at Lawrence Berkeley National Laboratory for more than 12 years.