Philip Leder Biography

Philip Leder

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Contents

Philip Leder Biography.....1

Contents.....2

Biography.....3

Biography

Philip Leder and his colleagues have contributed to the study of the genetic basis of **cancer** through their use of transgenic mouse models. The purpose of these studies has been to elucidate the genes that can contribute to the development of cancer, with an emphasis on identifying genes that specifically collaborate with one another to bring about cancerous growth.

Transgenic mice, in which the cancer-critical genes known as oncogenes have been introduced, have been considerably helpful in Leder's research. Leder and his colleagues constructed a transgenic mouse that possessed a **gene** implicated as being central in human breast cancer. They showed that, while over-regulation of the gene in older animals caused breast cancer, the gene function was necessary earlier in life. Thus, they surmised that other mutations in other genes were necessary to stimulate the development of a **tumor**. Ongoing research has identified candidate genes.

Leder's research indicates that the cooperative relationships between oncogenes may involve various signaling pathways within tumor cells that might contribute to the development of malignancy. Elucidating the identity of the genes and the pathways would lead to the enhanced development of therapeutic drugs for cancer.

The other main research thrust of Leder and his colleagues has been the molecular genetic approach to the so-called pattern formation in the mouse embryo. Pattern formation refers to the process by which cells of a developing organism arrange themselves in space to form a specific organ. Using insertional mutagenesis, a **mutation**, which altered development of the limbs of the mouse embryo, was obtained. The gene responsible was identified and cloned, and characterization of its gene product has begun.

The work of Leder is significant as it advances the understanding of the genetic underpinnings of cancer, of the genetic interactions involved in tumor development and in identifying candidate targets for drug therapy.

Recognizing the importance of his work, Leder has been the recipient of numerous awards and honors, including the 1989 National Medal of Science, presented to him by United States President George Bush. Leder is currently the chair of the department of **genetics** at Harvard University, and is also a Howard Hughes Medical Institute Investigator.