



CANCER PREVENTION & RESEARCH INSTITUTE OF TEXAS

Award ID:
R1113

Project Title:
Recruitment of Established Investigators

Award Mechanism:
Recruitment of Established Investigators

Principal Investigator:
Jenkins, Nancy

Entity:
The Methodist Hospital Research Institute

Lay Summary:

Dr. Nancy A. Jenkins returned to the United States in September 2011 and became Co-Director of the Cancer Biology Program, along with her husband and long-term collaborator, Neal Copeland, at the newly formed Methodist Hospital Research Institute (TMHRI) in Houston, Texas. For more than 30 years, they have model human diseases affecting many organ systems including disorders of the immune, visual, auditory, skeletal, nervous, pigmentation, and hematopoietic systems, in mouse. They have also had a long-standing interest in modeling human cancer in mice and for the past six years have focused exclusively on providing a better understanding of the genetics of cancer with the hope that new drug targets useful in the targeted treatment of human cancer can be identified.

Dr. Jenkins received her Ph.D. degree in Molecular and Cellular Biology from Indiana University in 1977 and carried out postdoctoral training in the molecular biology of retroviruses at the Dana Farber Cancer Institute, Harvard Medical School. Here, she met Dr. Copeland and they decided to take their first independent positions at The Jackson Laboratory with the intent of using retroviruses as insertional mutagens in mice. In particular, they initiated their studies on the identification of candidate cancer genes in hematopoietic tumors, which is the principal type of cancer induced by retroviruses. They continued this work, as well as many other studies, at the National Cancer Institute-Frederick. In 2005, they reported success in modeling human cancer in mice using the Sleeping Beauty (SB) transposable element system. Using SB, it is now possible to model virtually any type of solid tumor in mice; solid tumors are of course the most common kind of cancer that affects humans. To fully exploit this technology, Dr.'s Jenkins and Copeland moved to the Institute of Molecular and Cell Biology in Singapore, where Dr. Copeland served as the Director, and Dr. Jenkins as Deputy Director, for most of their stay. A massive forward genetic screen for genes involved in the initiation, progression and metastasis of cancer in 16 different models in 11 organ types was performed in their laboratory in Singapore and they returned to the US with a large collection of candidate cancer genes in hand.

At TMHRI, Dr. Jenkins will complete the transposon screens initiated in Singapore and initiate several new screens for which we do not yet have good models (lung and ovary). We will also begin sorting out which genes are important for different stages of cancer development: initiation, progression and metastasis. Importantly, we will oversee the establishment of a publically available database in collaboration with Dr. Stephen Wong

of TMHRI. We will deposit all of the data we have generated in the various screens as well as that of other labs performing transposon mutagenesis, in this database. This information will then be integrated with all of the data from human tumors being generated by the International Cancer Genome Consortium. This comparative genomics approach will help us identify genes that actually drive cancer formation versus those that are simply passengers in tumor outgrowth. Finally, we will take the most promising candidate cancer genes and begin validating them by studying them in human patients samples and by using various high-throughput experimental strategies that we are developing.

Dr. Jenkins has served on numerous scientific advisory and editorial boards and has consulted for several biotechnology companies. She is a member of the National Academy of Sciences, USA and one of the worlds most highly cited biomedical research scientists.