CANCER PREVENTION & RESEARCH INSTITUTE OF TEXAS

Award ID:
R1101

Project Title:
Recruitment of First-Time, Tenure-Track Faculty Members

Award Mechanism:
Recruitment of First-Time, Tenure-Track Faculty Members

Principal Investigator:
O'Donnell, Kathryn

Entity:
The University of Texas Southwestern Medical Center

Lay Summary:

Dr. Kathryn O'Donnell received a Bachelor of Science degree in Biology from Cornell University in 1998, and subsequently completed an Intramural Research Training Award (IRTA) fellowship at the National Institutes of Health. Kathryn then joined the Human Genetics and Molecular Biology Graduate Program at the Johns Hopkins University School of Medicine and was awarded a Ph.D. in 2005. As a graduate student working with Dr. Chi Dang, she focused on the characterization of target genes of the Myc oncogenic transcription factor that are involved in cellular proliferation and growth control. She investigated the mechanisms and importance of regulation of iron metabolism for Myc-mediated phenotypes. Her work established that Transferrin Receptor 1 (TFRC1), a major mediator of iron uptake in mammalian cells, is a critical Myc target gene that is necessary for cell cycle progression and further provided a molecular basis for increased TFRC1 expression in human tumors. She also showed that microRNAs are a novel class of Myc target genes.

Kate then pursued postdoctoral training with Dr. Jef Boeke in the Molecular Biology and Genetics Department at Johns Hopkins. In 2006, she was awarded a postdoctoral fellowship award by the Damon Runyon Cancer Research Foundation. Her postdoctoral research focused on the biology of transposable elements and the use of these sequences in forward genetic screens. At this time, she became interested in utilizing these elements as tools for novel cancer gene discovery. In collaboration with Dr. David Largaespada's laboratory, she performed a mutagenesis screen using an established DNA transposon system to identify genes that accelerate liver tumorigenesis in mice. This approach resulted in the identification of numerous novel genes that contribute to liver tumor development. To characterize the roles of the identified genes in tumor initiation and progression, she performed functional studies using in vitro and in vivo cancer models. In addition, she developed and characterized a novel mouse model based on a LINE-1 retrotransposon which provides a powerful platform for mutagenesis screens.

In 2011, Kate received a "Recruitment of First-Time Tenure-Track" Award from the Cancer Prevention and Research Institute of Texas. She started her position as Assistant Professor in the Department of Molecular Biology at UT Southwestern Medical Center in Dallas on July 1st. She is now utilizing transposon-based systems to perform screens in cell lines and in mice for the purpose of identifying novel tumor suppressors and oncogenes. At UT Southwestern, her long-term goal is to apply unbiased genetic approaches to understand the mechanisms that contribute to tumor cell initiation,

progression, and metastasis. This work will provide important insights into the genetic alterations that drive tumorigenesis and may ultimately lead to the discovery of novel therapeutic targets.