CANCER PREVENTION & RESEARCH INSTITUTE OF TEXAS

Award ID:
R1004

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

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

Principal Investigator:
Ma, Li

Entity:
The University of Texas M.D. Anderson Cancer Center

Lay Summary:

The overarching goal of my laboratory is to understand microRNA-mediated regulation of metastasis, epithelial-mesenchymal transition (EMT), and stem cells. It has become increasingly evident that cancer pathogenesis can involve a superfamily of small non-coding RNAs named microRNAs. While the oncogenic or tumor-suppressing functions of a number of microRNAs have been characterized, the role played by microRNAs in mediating metastasis was addressed only lately by work from myself and several other groups. My recent work provided the first functional evidence that overexpression of a specific microRNA can contribute to the development of metastasis, which can be exploited therapeutically in treating metastases in mouse models. This work serves as a paradigm for my future investigation. In the next five years, I will build on it to investigate metastasis-regulating microRNAs through molecular, genetic, pharmacological and genomic approaches. Such studies will enable more precise evaluation of the roles, mechanisms, and therapeutic utility of these microRNAs in tumor metastasis, and will help illuminate the genetic and molecular basis of metastasis and the possible connections to developmental processes. Development of agents like ‘antagomirs’ is likely to be a significant step forward in the process of developing microRNA-based, anti-metastasis therapeutic strategies. Furthermore, I will explore the role of microRNAs in EMT and stem cells; in particular, I will investigate the possibility of inducing EMT and stem cells with specific microRNAs. This study represents a new paradigm for EMT and stem cell induction, will help elucidate the molecular processes that link EMT, stem cells, and metastasis, and may lead to discovery of new microRNAs that hold implications for diagnosis, prognosis, and treatment of metastatic cancer.