



CANCER PREVENTION & RESEARCH  
INSTITUTE OF TEXAS

Award ID:  
RP100456

Project Title:  
Photonic Probes for Functional Analysis of microRNAs and mRNAs in Living Cells

Award Mechanism:  
Individual Investigator

Principal Investigator:  
Li, Wen-hong

Entity:  
The University of Texas Southwestern Medical Center

Lay Summary:

microRNA has emerged as a key player in human diseases including cancer. Understanding the regulation of microRNA biogenesis, target recognition, and cellular localization not only offers us mechanistic insights on how miRNAs function in cells, but will also aid us to develop more accurate diagnostics and effective therapeutics against cancer. This proposal aims to fill a major technological gap in studying miRNA biology: to visualize and to manipulate endogenous miRNAs in living cells with high spatial and temporal resolution in order to perform functional analysis of microRNA:target mRNA interactions. Initial applications of these reagents will focus on a model organism, the nematode *Caenorhabditis elegans*. The small size, optical transparency and well-characterized microRNA pathways in this organism offer unparalleled advantages for efficient reagent development, validation, and biological application. Once developed, concepts, reagents and methods described here should have broad uses in cellular, neuronal, and developmental biology in diverse biological systems, including mammals.