Award ID:
RP110349

Project Title:
Development of a novel chemogenetic approach to structure/function analysis of human telomerase RNA—a universal anticancer target

Award Mechanism:
High Impact/High Risk

Principal Investigator:
Qiao, Feng

Entity:
Texas A&M University

Lay Summary:

Telomerase, an almost universal marker for human cancer, is up-regulated in 80-95% of actively dividing cancer cells; however, it is either reduced or absent in normal tissues. This contrast makes the inhibition of telomerase an attractive target for cancer therapeutics. Telomerase is an RNA-protein enzyme required for the replication of the ends of chromosomes. Its protein subunit (TERT) contains a reverse transcriptase motif, which copies a template sequence within the intrinsic RNA subunit (TR), thereby adding telomeric DNA repeats to the ends of chromosomes. Understanding the structure-function relationship of telomerase is pivotal to designing highly efficacious anti-telomerase drugs. In order to achieve a complete understanding of mechanistic aspects of telomerase, we propose to develop a new high-throughput chemical biology approach to identify every functional chemical group in the telomerase RNA, and then to elucidate the functional roles they play in telomerase catalysis.