CANCER PREVENTION & RESEARCH INSTITUTE OF TEXAS

Award ID:
RP140842

Project Title:
Determining the Functional Role of microRNAs in Viral Tumorigenesis

Award Mechanism:
Individual Investigator

Principal Investigator:
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Entity:
The University of Texas at Austin

Lay Summary:

It is underappreciated that a share of human cancers are caused by virus infection. These cancers include types of lymphomas, skin cancers, oral tumors and cervical carcinomas. A new class of gene products of both host and viral origin, called microRNAs, plays an important role in helping most of these viruses maintain lifelong infections. Furthermore, mounting evidence suggests that microRNAs of both host and viral origin are directly involved in tumorigenesis. However, the current understanding of how tumor viral microRNAs contribute to cancer lags behind that of host microRNAs. The goal of this application is to determine how tumor viruses utilize microRNAs to promote infection and cause cancer. To accomplish this, we utilize a bold strategy that departs from the rest of the field. In a single experiment format, we will test the functionality of all known human tumor viral miRNAs. We will focus on those functions most relevant to cancer. As this is a renewal application, the achievements from our first grant period (including identification of microRNAs from diverse tumor viruses that converge on evading the same host defenses and promoting aberrant cellular growth) validate the likely success of our approach. With this knowledge, we can prioritize those viral and host genes most relevant to cancer. For successful infection, viruses must overcome some of the same hurdles that tumors face, including preventing cell death and avoiding the immune response. Therefore, by better understanding tumor virus biology, we also increase our understanding of non-viral cancers. The significance of these studies is that they will advance an improved understanding of the mechanisms of tumorigenesis for numerous cancer types. The impact of this work will be a foundation of new biomarkers and therapeutic targets for viral and non-viral-associated cancers.