CANCER PREVENTION & RESEARCH INSTITUTE OF TEXAS

Award ID:
RP140464

Project Title:
Next Generation Sequencing and Transcriptome Profiling of Oral Potentially Malignant Lesions To Identify Markers of Cancer Risk and Targets for Chemoprevention

Award Mechanism:
Individual Investigator

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

Lay Summary:

Many oral cancers arise from non-cancerous sores in the mouth termed oral potentially malignant lesions (OPMLs). While the presence of OPMLs places an individual at increased risk of oral cancer, not all OPMLs develop into cancer. Because OPMLs occur in areas that are easily followed by examination, readily biopsied for pathological evaluation, and are precursors of cancer, they are considered to be an ideal source to study molecular changes that eventually cause malignant tumors. Furthermore, they provide a unique opportunity for chemoprevention studies (i.e., use of drugs to reduce cancer risk), as patients with OPMLs have a higher probability of being diagnosed with oral cancers, but have not yet fully developed a malignancy. To date, little success has been observed with chemopreventive drugs for oral cancers, partially due to our lack of understanding the molecular alterations that drive tumor formation. Molecular changes that both predict a high risk of developing cancer and play a role in malignant transformation are considered to be the most promising targets for chemoprevention. As such, we hypothesize that comprehensive characterization of OPMLs at the DNA/RNA level using modern techniques (e.g. gene sequencing) will allow us to identify novel risk markers and opportunities for chemoprevention. In this project, we will perform molecular profiling of patients with OPMLs that were enrolled in one of the largest oral cancer chemoprevention studies performed to date to identify markers that can accurately predict cancer. Furthermore, we plan to screen and study drugs that can potentially prevent tumor formation in mice harboring pre-malignant cells with these specific genetic alterations. This project will eventually allow us to develop a personalized chemoprevention trial, in which patients with OPMLs would be tested for specific molecular changes to assess their cancer risk, treated with a specific drug, with an ultimate goal of preventing oral cancers.