



CANCER PREVENTION & RESEARCH INSTITUTE OF TEXAS

Award ID:
RP100932

Project Title:
Multi-Modal Optical Imaging Systems for Early Detection of Oral Cancer

Award Mechanism:
Individual Investigator

Principal Investigator:
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Entity:
Rice University

Lay Summary:

Oral cancer is a major global health problem. Most patients present with advanced tumors when treatment is less successful and more expensive than interventions for early disease. To improve outcomes, we must improve detection and diagnosis of precancerous lesions and early cancers. Widefield autofluorescence imaging has emerged as a promising new technology to increase the sensitivity of screening, though recent data suggests this may come at the expense of reduced specificity. Widefield fluorescence imaging devices, such as the VELscope, predominantly collect light originating in the stroma. Neoplasia is associated with loss of stromal fluorescence; however, the presence of inflammation – a stromal phenomenon – can mimic loss of autofluorescence, potentially reducing specificity. Newer high resolution imaging techniques can directly image epithelial cells to monitor features such as increased nuclear-to-cytoplasmic ratio. We hypothesize that multi-modal optical imaging, the combination of widefield autofluorescence and high resolution imaging, may improve the ability to discriminate early neoplasia from benign inflammation, leading to a technique with high sensitivity and specificity. The goal of this proposal is to develop, optimize and validate a Multi-Modal Optical Imaging System (MMIS) which combines the high sensitivity of autofluorescence imaging together with the high specificity of high resolution imaging. Image analysis algorithms will display processed images in real time, providing automated diagnostic criteria for community-based oral screeners.