CANCER PREVENTION & RESEARCH INSTITUTE OF TEXAS

Award ID:
RP180588

Project Title:
Novel Computer Aided Diagnosis System For Early Detection Of Oral Cancer Based On Quantitative Autofluorescence Imaging

Award Mechanism:
Individual Investigator Research Awards for Prevention and Early Detection

Principal Investigator:
Jo, Javier

Entity:
Texas A&M Engineering Experiment Station

Lay Summary:

The American Cancer Society estimates that 48,330 new cases of cancer in the oral cavity and pharynx will be reported this year. When diagnosed at early stages, the 5-year survival rate is 83%. However, when diagnosed at intermediate or advance stages, the 5-year survival rate drops to 62% and 38%, respectively. In addition, while early stage treatment may only require minor surgery to remove the localized tumor, later stage treatment could require surgical removal of parts of the face and neck followed by reconstructive surgery, hence drastically reducing the patient's quality of life. Therefore, early detection of oral cancer holds great promise for improving both the survival rate and the quality of life of oral cancer patients. Unfortunately, benign oral lesions are often difficult to distinguish from dysplasia or early stage cancer even for experienced healthcare professionals. As a result, only 31% of patients are diagnosed at early stages despite the fact that the oral cavity is easily accessible for direct examination. Hence, there is a critical need for new clinical technologies for reliable early diagnosis of oral cancer and dysplasia. This early-detection research grant will develop a clinical tool for noninvasive, fast and automated in situ detection of early stage oral cancer and dysplasia vs. benign conditions. Beyond early detection, this tool could also assist in every stage of the clinical management of oral cancer patients, including surgical guidance and monitoring for recurrence, which occurs in ~30% of oral cancer patients. This tool would thus enable precision medicine to oral epithelial cancer patients. Finally, the demonstrated success of this clinical tool in oral epithelial cancer will herald future success with other cancers of epithelial origin, which accounts for more than 80% of all cancers.