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Fourier Transform And Ultrahigh Resolution Mass Spectrometry Studies Of Stress Biomarkers In Human Saliva: Individualized Metabolomics And Proteomics

Our long-term research goal is to use ***non-invasive*** biological sampling methods for ***early detection of human diseases***. With recent funding from the Defense Advanced Research Project Agency (DARPA) and support from other federal agencies such as the National Science Foundation (NSF), a one-of-a-kind instrument was developed in the PI's research laboratories (at the University of Maine) for characterization of complex biological/chemical mixtures. Development of this technology has merited extensive media coverage such as on the CBS' Osgood Files, ABC 20/20, and the National Geographic Channel in 2011. This state-of-the-art high-end instrument will be available in Baylor for the proposed research.

Our specific goal for the proposed activities is to ***identify potential stress biomarker(s)*** that are present in human saliva. In the proposed interdisciplinary project, Baylor ***chemists will work closely with psychologists, biochemists, and other collaborators in the medical community (e.g., Scott and White Health Care)*** to identify important human saliva biomarkers. Human saliva samples, under an existing Maine IRB, have been collected but mass spectral data collection and analyses are ongoing. An undergraduate student, working closly with senior scientists, will participate in this hypothesis-driven research to acquire the necessary data for submission of a large-scale NIH proposal.

With the available local expertise and accessible instrumentation in Baylor, we are at a critical juncture and uniquely qualified to establish our global leading role in this particular field of biomedical research. Successful funding will have a high impact on research (yielding several publications and vital preliminary data for submission of a R01 NIH proposal(s), and new discoveries on disease related saliva biomarkers) and training of undergraduate students (a successful model for future NSF Research Experiences for Undergraduate (REU) proposal submissions).