Combined Photoacoustic and Fluorescence Imaging as a Dual-Modality

Opportunity and Significance

• The overwhelming need for, and clinical interest in, noninvasive diagnostic procedures

• Single modalities alone can only provide a limited amount of information

• A dual-modality system would allow for enhancements in noninvasive diagnostic procedures for tumor detection

Technical Objectives

• The development of a dual-modality imaging system that combines photoacoustic (PA) microscopy and fluorescence imaging (FI)

• To outline the enhancements to the both qualitative and diagnostic information available in the combined images from this system

Technical Approach, Accomplishments, and Results

• The combined system has been designed and is being optimized for dual image acquisition

• System is designed with external triggering to coordinate acquisition between PA and FI

• Validation of system requires FI image acquisition and PA image reconstruction

Next Steps for Development and Test

• Final validation and optimization of system function to enhance imaging capabilities

• Acquisition of biological samples or specimens to test diagnostic capabilities

• Enhance design for imaging biological systems

Commercialization Plan & Partners

• The research effort were done entirely at Wayne State's Optical & Photoacoustic Imaging Research and Analysis Laboratory (OPIRA)

• We have connect with a physician from the Henry Ford Health System to develop a project for imaging nanoparticles in glioblastoma

• Limitations to research efforts are related to resources available for the laboratory

References


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