

James & Esther King Biomedical Research Program

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*Optics and Photonics
University of Central Florida*

*2008 Program
Small Business Technology Transfer
(1-year project)*

Project Title: Real Time Monitoring of Blood Coaguability for Thrombolytic Therapy

Project Summary: Smoking and chronic obstructive pulmonary disease have been linked to pathologic blood clotting causing acute coronary syndromes, venous thromboembolism, and stroke. Timely restoration of blood flow via thrombolytic therapy in intensive care units (ICU) is effective in salvaging the affected tissue. Similarly, anticoagulants are routinely used to prevent blood clotting during a wide range of procedures. To ensure that patients receive the correct dose of anticoagulant or thrombolytic agent, clinicians must accurately assess their coagulability status before, during, and after the procedure. Current ICU or operating room (OR) blood clotting tests do not allow for real-time blood coagulability monitoring. The grant aims to develop a near-patient instrument for ICU/OR use, capable of real-time, continuous coagulation monitoring without the use of reagents. The instrument is based on a novel optical method, Low-Coherence Dynamic Light Scattering, with proven capabilities of investigating viscoelastic properties of whole blood. The instrument is capable of real-time, in-vivo measurements using an optical fiber probe that could be simply inserted into a peripheral vein or through a cannulated vessel. If introduced in clinical practice, the optical real-time blood coagulability-monitoring instrument could eliminate unnecessary operational delays while facilitating decision-making on initiation and maintenance of thrombolytic or anticoagulant therapies.