

VIABILITY EVALUATION OF PRE-TRANSPLANTATION HUMAN DONOR LUNGS USING POLARIZATION-SENSITIVE OPTICAL COHERENCE TOMOGRAPHY



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ABSTRACT

Lung transplantation remains the last resort for patients with end-stage lung diseases, yet the limited availability of suitable donor lungs poses a major clinical challenge. In this study, we employed polarization-sensitive optical coherence tomography (PS-OCT) to visualize and quantify alveolar and fibrotic tissue in human donor lungs. PS-OCT revealed significant regional variation in alveolar structure and fibrosis across different lung areas. Quantitative analysis demonstrated accurate measurement of alveolar density, size, wall thickness as well as fibrotic content, with findings validated by histology. These results suggest that PS-OCT offers a promising, noninvasive tool for evaluating donor lung quality prior to transplantation.

BIO

Dr. Feng Yan earned his Ph.D. in Biomedical Engineering from the University of Oklahoma and currently serves as a Postdoctoral Research Associate. His research focuses on developing advanced optical imaging technologies to assess organ viability and guide cancer diagnostics. Since joining OU, Dr. Yan has published over 20 peer-reviewed journal articles and presented at more than 40 national and international conferences. He is a co-inventor on multiple technology disclosures and patents related to imaging-based transplant evaluation platforms. His work has been recognized with the Overall Outstanding Graduate Student Award, the Dissertation Excellence Award, and multiple research awards from the Stephenson Cancer Center and OU.