

Broadband Optical Rotary Junction with High Return Loss for Analysis of Plaques

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ABSTRACT

Researchers at the University of California, Davis have developed an intravascular catheter system that integrates Fluorescence Lifetime Imaging (FLIm) with Polarization-Sensitive Optical Coherence Tomography (PS-OCT) for advanced plaque assessment in coronary artery disease.

FULL DESCRIPTION

This intravascular catheter system merges the capabilities of FLIm and PS-OCT to offer a comprehensive multi-scale analysis of plaque structure and biochemical composition. It enables high-resolution morphological imaging, tissue microstructure analysis via polarimetry, and biochemical composition assessment without the need for any molecular contrast agents. The system is designed with a low profile and high-speed imaging capabilities, making it suitable for clinical research and diagnosis in cardiology.

APPLICATIONS

- ▶ Advanced diagnostic tools for coronary artery disease.
- ▶ Research tools in interventional cardiology for evaluating new treatment modalities.
- ▶ Enhanced plaque characterization for the prevention of acute coronary syndromes.

FEATURES/BENEFITS

- ▶ Possesses comprehensive multi-scale assessment of plaque features.
- ▶ Enhances high-resolution imaging combined with biochemical composition analysis.
- ▶ Introduces a low-profile catheter design suitable for percutaneous coronary intervention.
- ▶ Mitigates cardiac motion artifacts with high-speed imaging capability.
- ▶ Enables simultaneous acquisition of co-registered data across multiple spectral bands.
- ▶ Broadens limited assessment capabilities compared to existing intravascular imaging technologies.
- ▶ Enables simultaneously capturing detailed morphological and biochemical plaque features.
- ▶ Does not require molecular contrast agents needed for traditional imaging modalities.
- ▶ Paves the way for new treatment modalities for CAD.

PATENT STATUS

Patent Pending

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

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OTHER INFORMATION

KEYWORDS

atherosclerosis,
cardiovascular, FLIm,
imaging, intravascular
catheter, OCT, plaque
characterization, PS-OCT,
spectroscopy, tissue
microstructure

CATEGORIZED AS

- ▶ **Medical**
- ▶ **Imaging**

RELATED CASES

2024-558-0

- ▶ Fabrication Method for Side Viewing Miniature Optical Elements with Free-Form Surface Geometry
- ▶ Real-Time Fluorescence Lifetime Tracking
- ▶ Motor Drive Unit for Combined Optical Coherence Tomography and Fluorescence Lifetime Imaging of Intraluminal Structures
- ▶ Interferometric Near Infrared Spectroscopy and Fluorescence Lifetime Imaging

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