**LOOKING INTO HIGH-RISK PLAQUE AND DES BIOLOGY: HIGH-SPEED INTEGRATED OCT-NIRF**

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A growing body of evidence has provided key mechanistic insight into atherosclerosis. The major goal of current cardiovascular imaging is to identify the high-risk vulnerable plaques (VP) before rupture, and many of the VP biological characteristics including inflammation, oxidative stress, and intraplaque hemorrhage are a suitable target for molecular imaging. While conventional imaging technologies allow visualization of the cardiovascular structures and assess biophysical properties, most of current imaging technologies are still limited to the evaluation of its anatomical features. To answer these unmet needs, our group has developed the fully integrated catheter system having both imaging properties of OCT and NIRF in a single fiber based on the OCT clinical platform. This highly translatable integrated OCT-NIRF imaging, as combined with a clinically approved NIRF emitting ICG, was able to simultaneously estimate both microanatomy and molecular detail in coronary plaque and DES as well. Moreover, with newly developed NIRF probe targeting specific receptor on plaque macrophages, OCT-NIRF catheter imaging system could have the potential to in vivo image macrophage subsets associated with the exposure to Hb in intraplaque hemorrhages, key feature of vulnerable plaques (VP). This novel imaging strategy could be a promising personalized approach for imaging-guided VP stabilization.