**INTRAVASCULAR OPTICAL IMAGING TECHNOLOGY FOR DETECTION OF HIGH-RISK PLAQUE**

**H. Yoo**

Hanyang University, Seoul, South Korea

Intravascular optical coherence tomography (IV-OCT) is a high-resolution imaging catheter used to visualize three-dimensional microstructure of arterial walls. Unprecedented high-resolution of IV-OCT for cardiovascular imaging enables clinicians to identify key features related to high-risk lesions inside a vessel. While gray-scale IV-OCT images allow clear visualization of the high-risk lesions, quantitative analysis requires time-consuming manual image-processing that hinders large clinical studies. To overcome this limitation, we have developed an automatic algorithm that enables robust and fast detection of lumen contour and stent struts to provide quantitative measurements of stent apposition and neointimal coverage, which are closely related to in-stent thrombosis. Additionally, we were able to measure lipid contents of lipid-rich plaque by analyzing spectral information of IV-OCT images. The algorithms would significantly improve the clinical utility of IV-OCT by providing rapid and accurate measurements regarding stent healing and plaque compositions. On the other hand, we have developed an endoscopic micro-OCT imaging catheter, which has even higher resolution up to 2 micron, to investigate cells and extracellular components associated with atherosclerosis, such as endothelium and microcalcifications. These novel imaging technologies could provide new opportunities for investigating vascular biology and stent pathobiology and for identifying high-risk plaques.