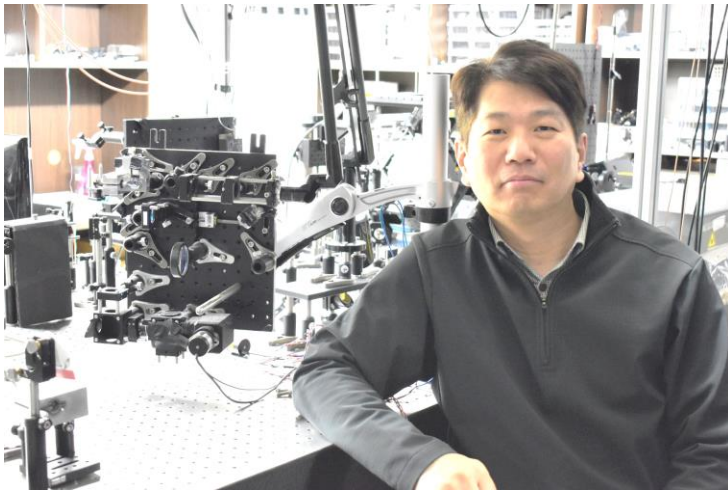


Optical microscopy for medical applications

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This presentation is about the development of optical microscopy techniques for medical applications. Optical microscopy has been developed and used for biological applications by providing high-resolution high-contrast images in the molecular, cellular, and physiological levels. However, optical microscopy is not a popular modality for medical applications even with potentials for sensitive disease detection via cellular examination due to various limitations including small imaging field of view (FOV) of 1mm^2 , limited contrasts, and imaging depths etc.

We developed new optical microscopy techniques with the enhanced imaging speeds and contrasts for non-invasive disease diagnosis and precision cancer surgery guiding. Specifically, we developed enhanced depth-of-field microscopy techniques for non-invasive examination of conjunctival goblet cells and the diagnosis of ocular surface diseases including dry eye disease, and laser scanning and light sheet microscopy techniques for the sensitive detection of brain tumors and skin cancers and the resection margin guiding. Overview of optical microscopy and its applications will be provided, and future perspective will be discussed.



Ki Hean Kim is a professor of Mechanical Engineering and I-Bio at the Pohang University of Science and Technology, Pohang, Korea. He received his Ph.D. in Mechanical Engineering of MIT (with Prof. Peter T. C. So; 2005) and did his postdoctoral training at the Wellman Center for Photomedicine, Massachusetts General Hospital/ Harvard Medical School (with Prof. Johannes F. de Boer; 2007) respectively.

The primary research interest of his group is to develop novel optical microscopy techniques to address challenges in biology and medicine (Biophotonics or Biomedical Optics). He is an author of approximately 110 articles published in the field of Biomedical Optics and Imaging Probes and serves as an editorial board member of the Current Optics and Photonics, the Photonics, and the Translational Biophotonics.