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강연 제목: 의료 적용을 위한 고성능 형광 현미경 개발
High-performance fluorescence microscopy for precision diagnosis and surgery guiding.

Abstract: Optical microscopy is a valuable tool for non-invasive early diagnosis and precise cancer surgery guidance via sensitive detection of cellular changes. Fluorescence microscopy, in particular, provides high-contrast cellular information in a high-throughput manner, assuming labeling agent toxicity is not a concern. Our team has been focused on developing high-performance fluorescence microscopy techniques for medical applications. We have developed a high-speed extended depth-of-field microscopy technique for non-contact examination of conjunctival goblet cells and the diagnosis of associated ocular surface diseases including dry eye disease. To achieve clinically compatible and specific labeling of conjunctival goblet cells, we used Moxifloxacin ophthalmic antibiotic solution. The technique has been verified through examination with human subjects. We have also developed open-top light sheet microscopy techniques for rapid and 3D pathological examination of excised specimens during cancer surgery, guiding surgical margin determination. For high-contrast visualization, various extrinsic nuclear labeling agents were employed. The technique's effectiveness has been demonstrated in several cancer specimens, including the skin, pancreas, and prostate.

Brief Biosketch
서울대학교 기계설계학과 학사/석사, MIT 기계공학과 박사, Harvard Medical School (MGH, Wellman Center for Photomedicine) 박사후 과정, 포항공과대학교 기계공학과 조교수/부교수/교수
의생명 광학, 생체 현미경 (공초점 현미경, 이광자 현미경, 빛 시트 현미경, 확장 초점심도 현미경 등) 연구 개발
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