

LOW-COST, IN VIVO MICROSCOPY

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In vivo microscopy is an optical microscopy approach that can visualize cellular details of human tissues non-invasively. Some of the *in vivo* microscopy technologies such as reflectance confocal microscopy, optical coherence tomography, and two-photon microscopy have become available as medical imaging devices and have been evaluated for a wide range of clinical applications. Since *in vivo* microscopy could reveal cellular changes associated with disease progression without taking biopsies from the patient, it can be used to aid diagnosis of various diseases in low-resource settings, where the facilities, equipment, and trained personnel needed for standard histopathologic diagnosis are scarce. However, widespread implementation of *in vivo* microscopy has not occurred yet, and one of the main reasons for this is the high device cost. We have developed several low-cost, *in vivo* microscopy devices for imaging applications in low-resource settings. In this talk, we will present our research on the portable confocal microscopy for imaging skin and eye diseases, smartphone-compatible confocal endoscopy for imaging cervical precancers, and scattering-based light sheet microscopy for imaging anal precancers.