

Realization of Common Platform Technology, Facilities, and Equipment that creates Innovative Knowledge and Products

Virtual Aperture Microscope: Long depth-of-focus imaging by computational optics

Project Leader : Yoshiaki YASUNO

Professor, Faculty of Clinical Medicine, University of Tsukuba

R&D Team : Yokogawa Electric Corp., SIGMA KOKI, Skye Technology Inc., Tatsuta, Tokyo Medical Univ. Ibaraki Medical Ctr., Dept. Ophthalmology at Univ. of Tsukuba, Optohub.



Summary :

This project aims at establishing a new imaging modality “virtual aperture microscope (VAM).” VAM is based on a hardware technology of optical coherence tomography (OCT) and digital-holographic signal processing. It simultaneously enables three-dimensionally high-resolution imaging and long-depth-range imaging. This property of VAM is particularly useful for investigation of thick cultivated tissues, such as one for regenerative medicine and cell spheroids for drug discovery.

The concept of VAM was first presented in 2006, but its practical realization had to wait for further development of phase-stable OCT technology, fast signal processing technology, and sophisticated theory of virtual aperture. In this project, we are going to tackle there three problems and establish a practical VAM realization.

