

RESILIENCE RESEARCH

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Whole-body/organ imaging with single-cell resolution toward organism-level systems biology

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Johannes Gutenberg Universität, Campus

Professor Hiroki R. Ueda steht gerne für Gespräche zur Verfügung, Kontakt Prof. Luhmann.

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Abstract

State-of-the-art tissue clearing methods provide unprecedented, high-quality optical access to very large biological specimens from individual organs to entire intact animals. When combined with light-sheet microscopy and image informatics, currently available tissue-clearing methods including a hydrophilic tissue clearing method CUBIC, allows us to perform whole-brain and whole-body imaging with sub-cellular resolution. In addition, delipidation of biological specimens by tissue-clearing methods enables whole-organ staining with specific antibodies, which can be applied even to human biology and pathology. When combined with tissue clearing, these labelling methods allow us to systematically extract structural and functional information of complex mammalian organs. In this talk, I discuss how tissue-clearing and its related technologies have been successfully integrated to create new biological insights and provide a perspective for future opportunities in biology and medicine.

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