Holotomography

Supplementary information

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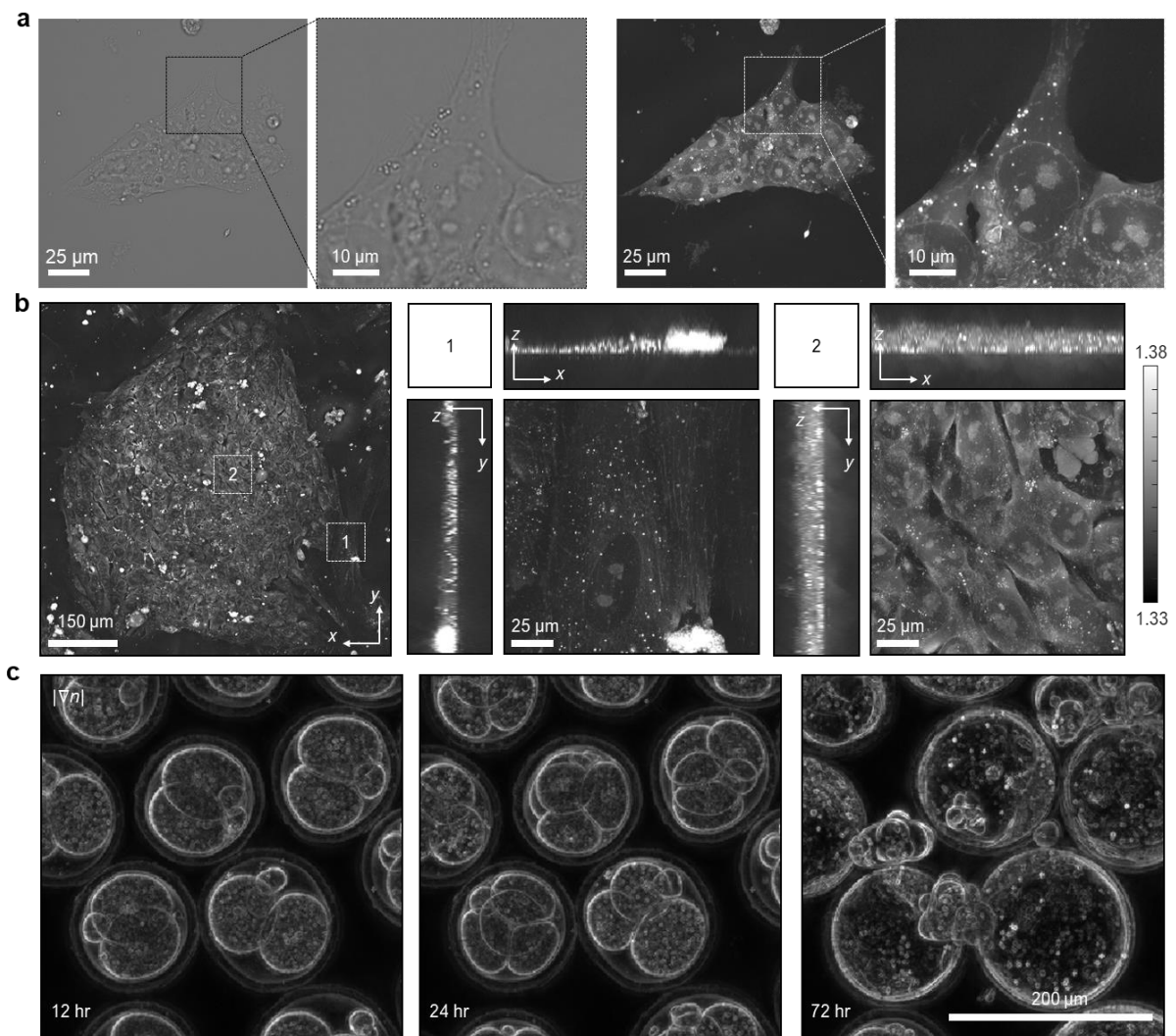
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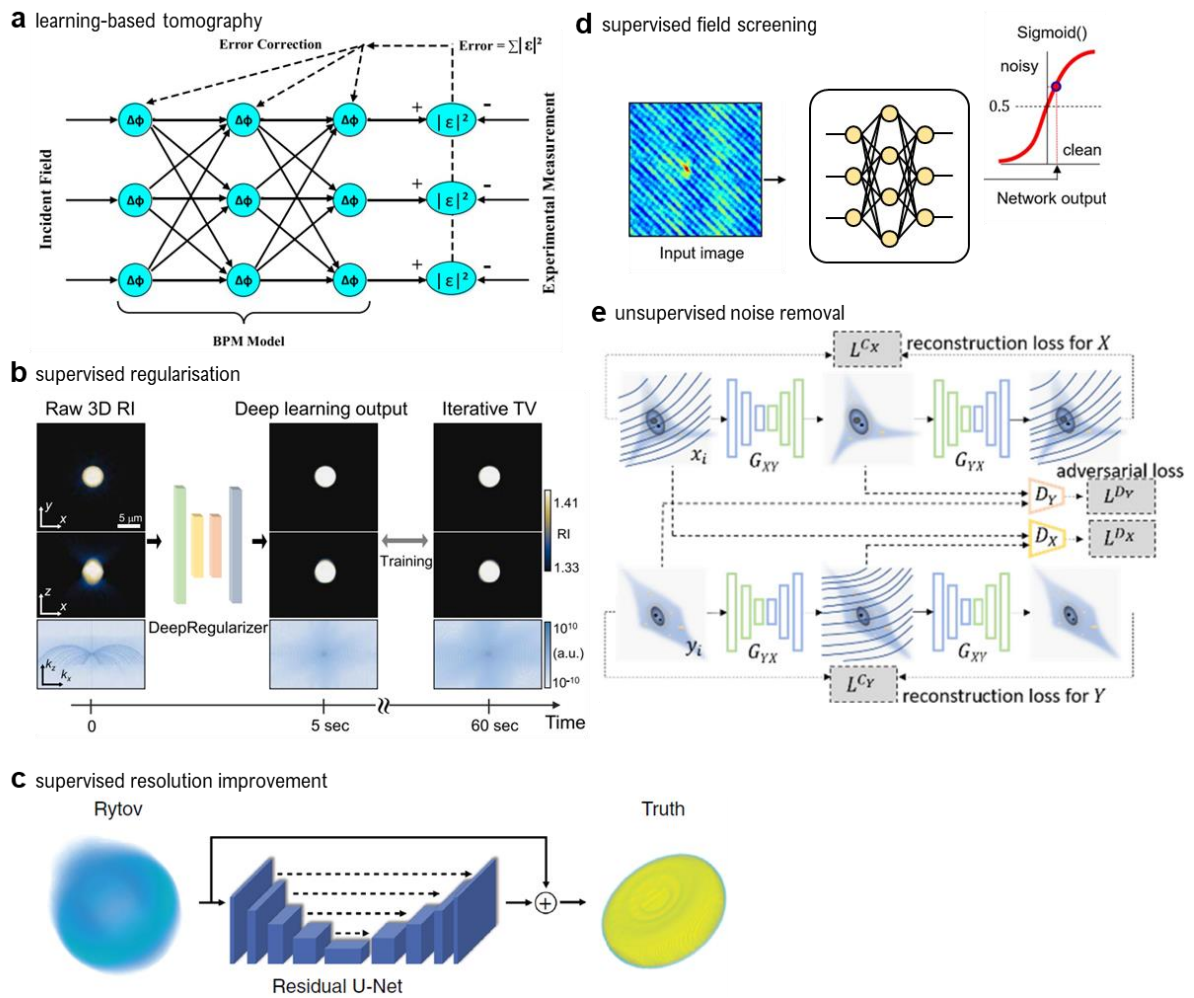[14]Tomocube Inc., Daejeon 34109, Republic of Korea

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Supplementary Figure 1 | Holotomography (HT) images of induced pluripotent stem cells (iPSCs) and mouse embryos. a | High-resolution iPSCs image from HT (Right) compared to bright field microscope (Left). b | Application of HT in identifying fully reprogrammed iPSC among unreprogrammed fibroblasts and partially reprogrammed iPSCs. c | Time-lapse HT images of mouse embryos displaying different developmental stages.

a learning-based tomography

b supervised regularisation

c supervised resolution improvement

d supervised field screening

e unsupervised noise removal

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35 **Supplementary Figure 2 | Machine-learning-based improvements of holotomography (HT). a** | Learning-

36 based inverse scattering for optical tomography[1]. **b** | Deep learning approximator for fast regularisation of HT

37 images[2]. **c** | Deep learning resolution enhancement beyond weak-scattering approximation[3]. **d** | Learning-based

38 optical field selection for improved coherent HT reconstruction[4]. **e** | Generative model for noise removal without

39 paired data[5]. Part a reprinted with permission from ref 1, OPTICA. Part b used with permission of IEEE, from

40 DeepRegularizer: rapid resolution enhancement of tomographic imaging using deep learning, Ryu et al. 40.5

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42 Three-dimensional tomography of red blood cells using deep learning, Lim et al. Advanced Photonics 2.2, (2020);

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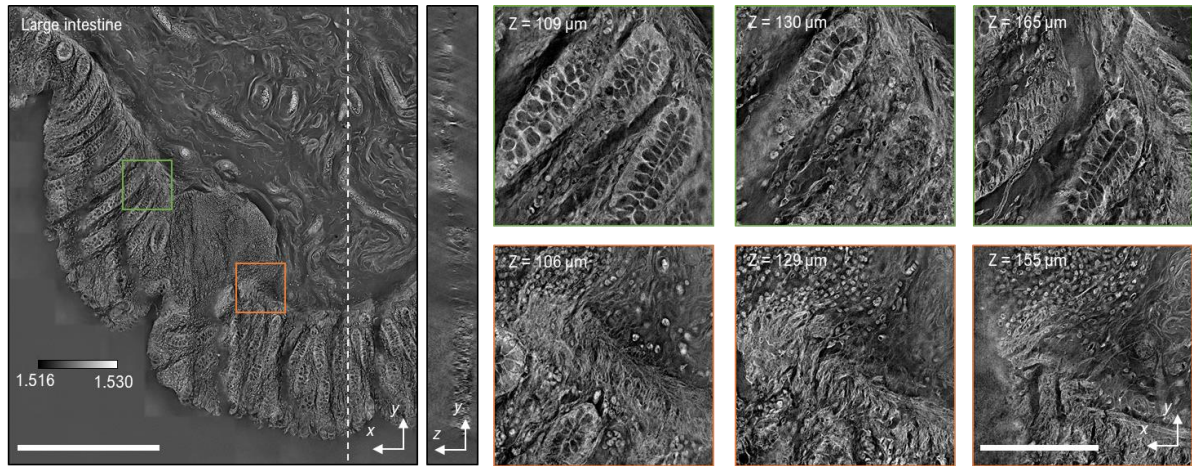
Supplementary Figure 3 | Holotomography (HT) in investigations of 3D thick tissue. (left) A large intestine histopathology tissue slide. (Right) the zoom images of the green and orange boxes at various axial positions[6]. Scale bar = 500 μm. Used with permission of SPIE, from Multiscale label-free volumetric holographic histopathology of thick-tissue slides with subcellular resolution, Hugonnet et al., Advanced Photonics 3.2 (2021); permission conveyed through Copyright Clearance Center, Inc.

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