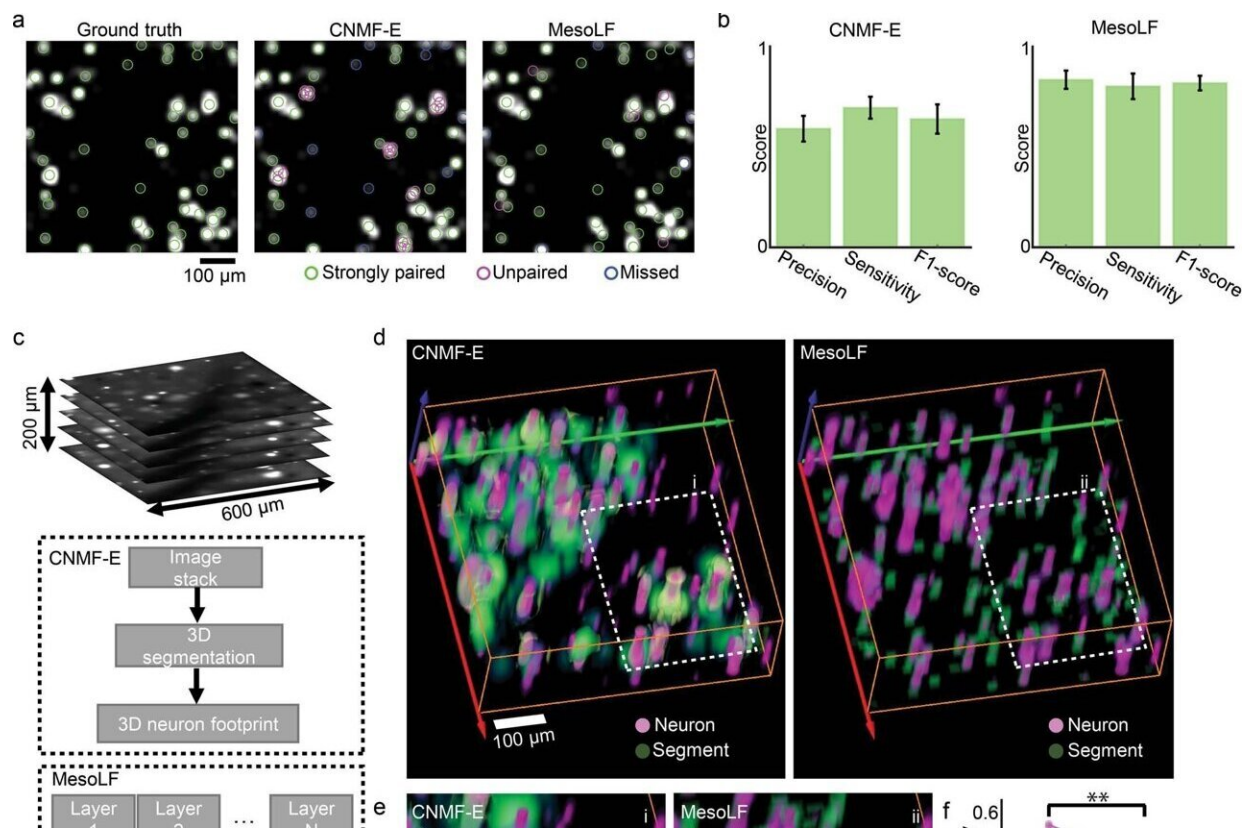


# New technique captures unprecedented view of the active brain

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Neuron segmentation performance. (a) Comparison of segmentation performance of MesoLF versus CNMF-E (template matching and shape-based selection steps) in a 2D slice from a MesoLF recording in mouse cortex, depth 100  $\mu$ m. Green circles: segments that strongly match with the ground truth. Blue circles: segments that only appear in the ground truth. Magenta circles: segments that are not consistent with ground truth. (b) Comparison of precision, sensitivity, and F1-scores for neuron detection performance in CNMF-E (template matching and shape-based selection steps) and MesoLF segmentation.

Same data as in main Fig. 3h, reproduced here for convenience. Height of bars: Mean. Error bars: s.d. Black circles:  $n = 5$  simulation runs. (c) Top panel: Illustration of 3D volume containing neurons and exhibiting scattering, as used for volumetric segmentation comparisons in remainder of figure. Schematic illustration of segmentation pipelines in CNMF-E (middle box) and MesoLF (bottom box). (d) 3D rendering of segmentation results from CNMF-E (left) and MesoLF (right). Magenta: Ground-truth neurons, green: segments. (e) Zooms into areas indicated by dashed rectangles in (d). (f) Comparison of the spatial similarity index of neurons paired between ground truth and output of CNMF-E (template matching and shape-based selection steps) versus MesoLF segmentation.  $p = 2.0e-9$ , paired one-sided Wilcoxon signed rank test.  $n = 63$  neuron pairs. \*\* p

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