

Description of Additional Supplementary Files

File Name: Supplementary Movie 1

Description: Comparing image quality between LM-CT and LLM-CT. Olfactory projection neurons labeled in *MZ19-Gal4* were imaged by LM-CT (top panels) and LLM-CT (bottom panels), respectively, from anterior (antennal lobe) to middle (lateral horn) and posterior (calyx) of the brain. Imaging depth is indicated. Scale bar = 10 μm .

File Name: Supplementary Movie 2

Description: Stochastic blinking raw images and reconstruction process. Left: 3D ortho slice of super-resolved dendritic *MZ19-Gal4* labeled olfactory projection neuron in three antennal lobe glomeruli. Middle: Time series of blinking events of one layer ($z = 24 \mu\text{m}$) projection neuron neurites immunostained with HMSiR. Right: Reconstruction process of localization events.

File Name: Supplementary Movie 3

Description: 3D rendering of neurons imaged with LLM-CT. 3D rendering of neurons located in lateral horn area in *MZ19-Gal4* labeled projection neurons in *D. melanogaster* brain imaged with LLM-CT.

File Name: Supplementary Movie 4

Description: Whole-brain super-resolution image. LLM-CT super-resolved dopaminergic neurons labeled in the *TH-Gal4*. Serial slices show well-resolved neurites throughout the whole brain, even at the optical lobe where fine neurites emit weak fluorescence.

File Name: Supplementary Movie 5

Description: Super-resolved protein distribution in *D. melanogaster* brain. Spatial distribution of VMAT proteins within and outside the DPM neurites in the whole MB.