



Astrocyte Mitochondria

Visualizations in the Layer 2/3 Serial EM volume

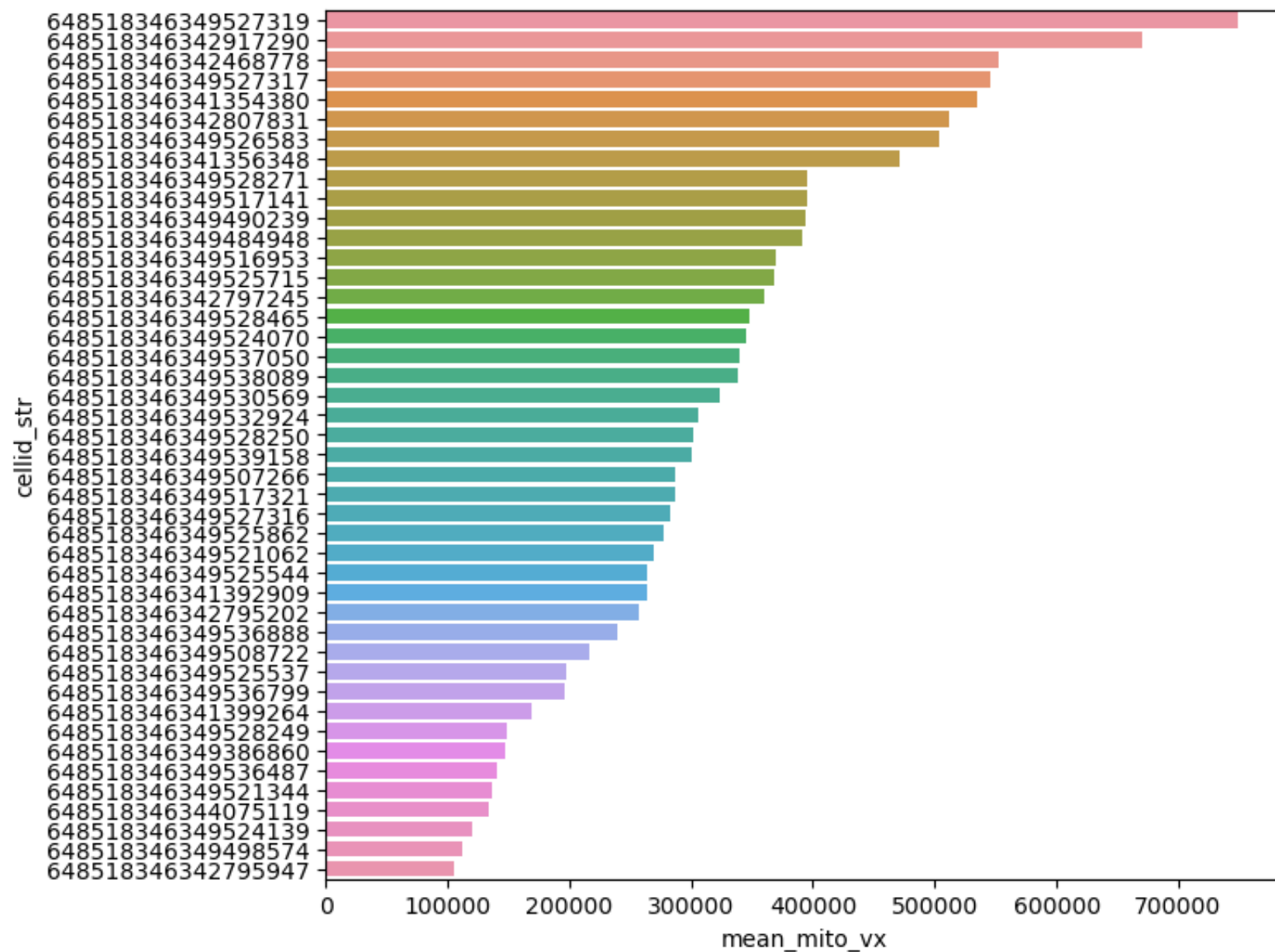
Recent studies reveal novel mitochondria function in astrocytes

Astrocytes have extensive branchlet and leaflet processes, abundant synapse contact that increases distally from the soma, and dense mitochondria networks: [Aten et al, Prog Neurobiol 2022](#)

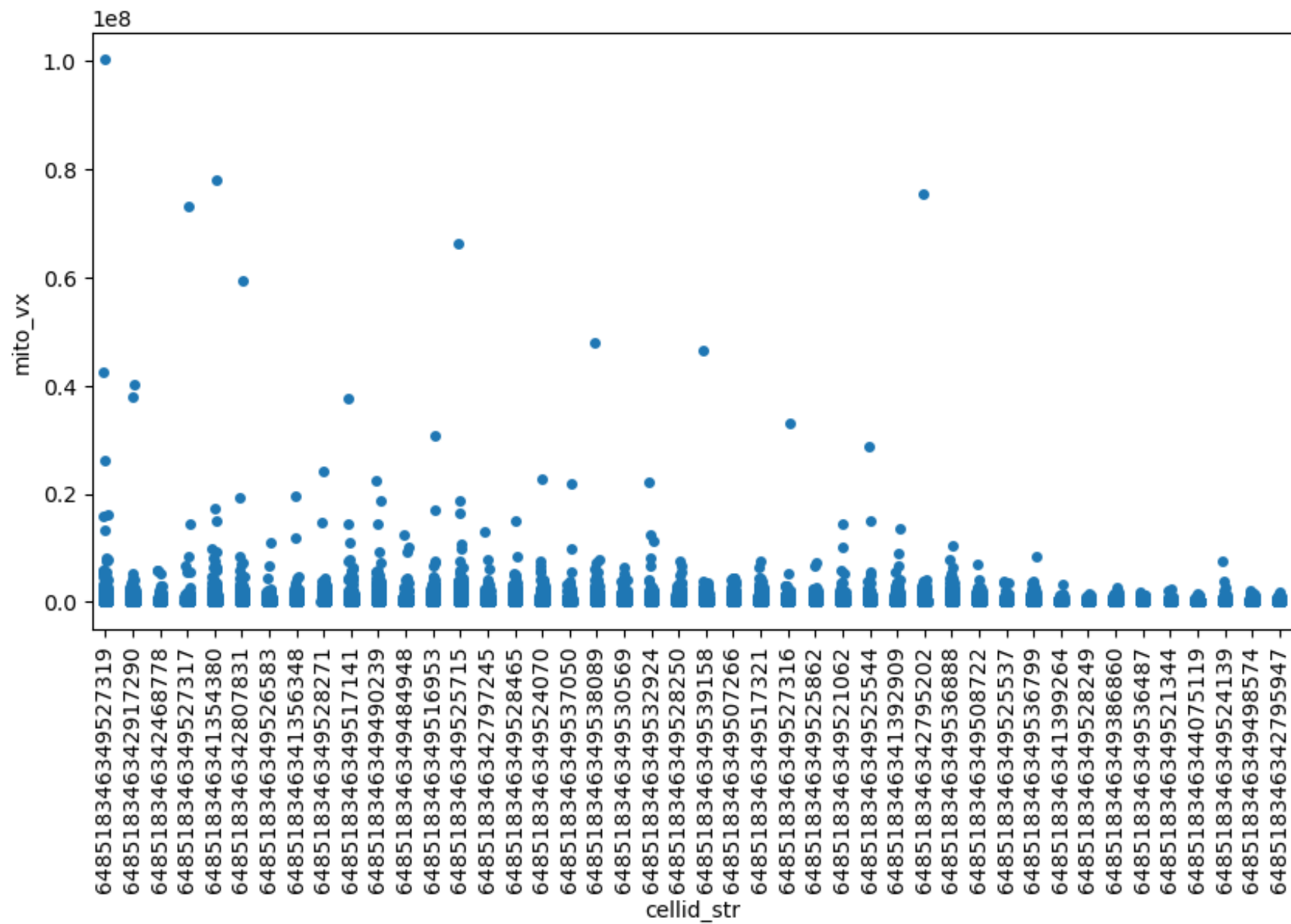
Transfer of healthy mitochondria from astrocytes to neurons has been shown in brain injury and disease: [Hayakawa et al, Nature 2016](#), [Ni et al, Redox Biology 2022](#), [Liu et al, J Nanobiotech 2022](#), and [Fairley et al., Cells 2022](#)

The involvement of astrocyte mitochondria in normal physiological processes (e.g., synaptic signaling, neurovascular metabolism, etc.) remains an area of active investigation

Mean mito
voxels of all
mitochondria
per astrocyte



Strip plot of
mito vx for
all mitos in
an astrocyte



Example: astrocyte 648518346349527319



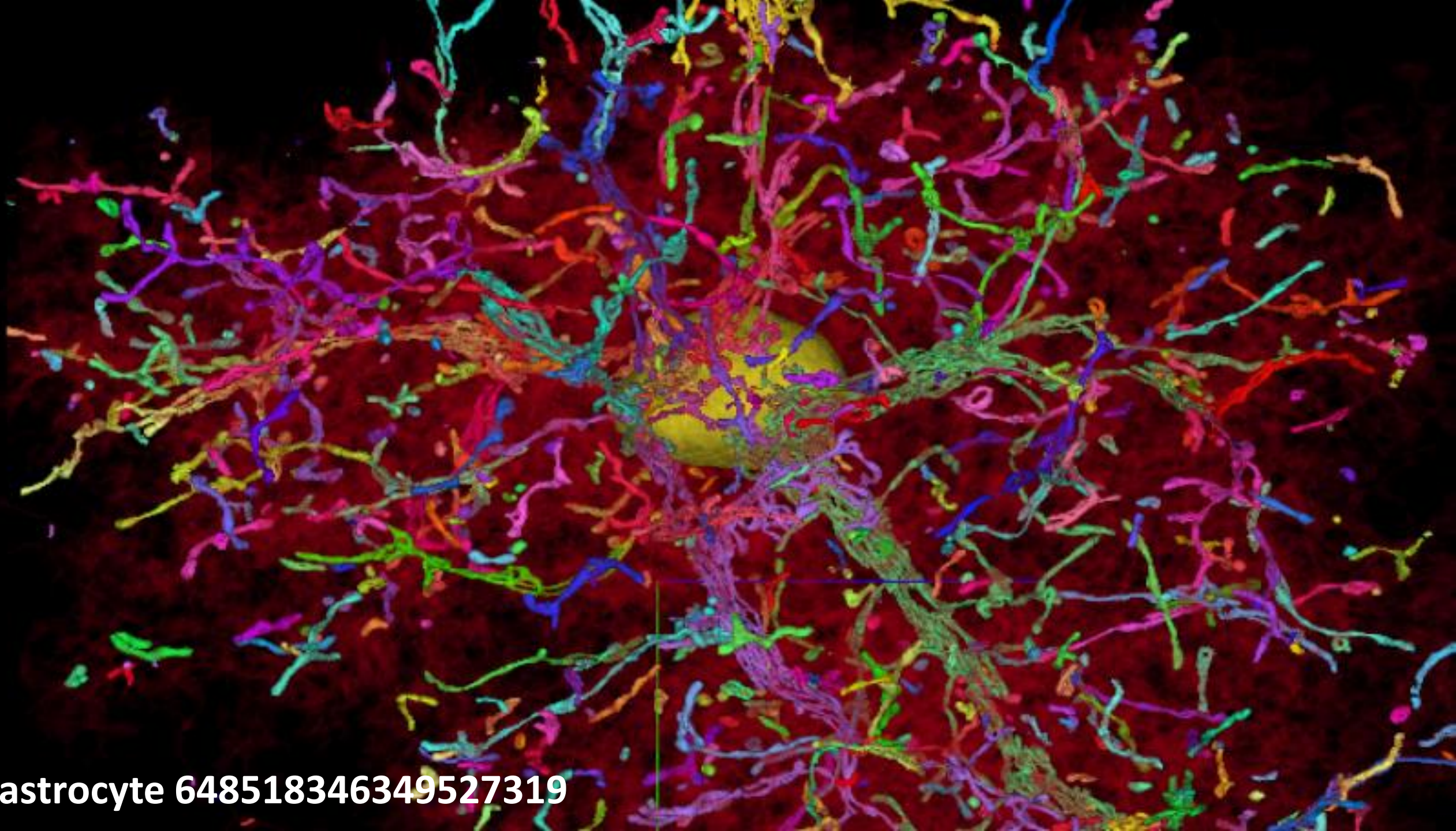
Has the largest continuous mitochondria
in the entire Layer 2/3 volume



Has nine very large continuous mitochondria

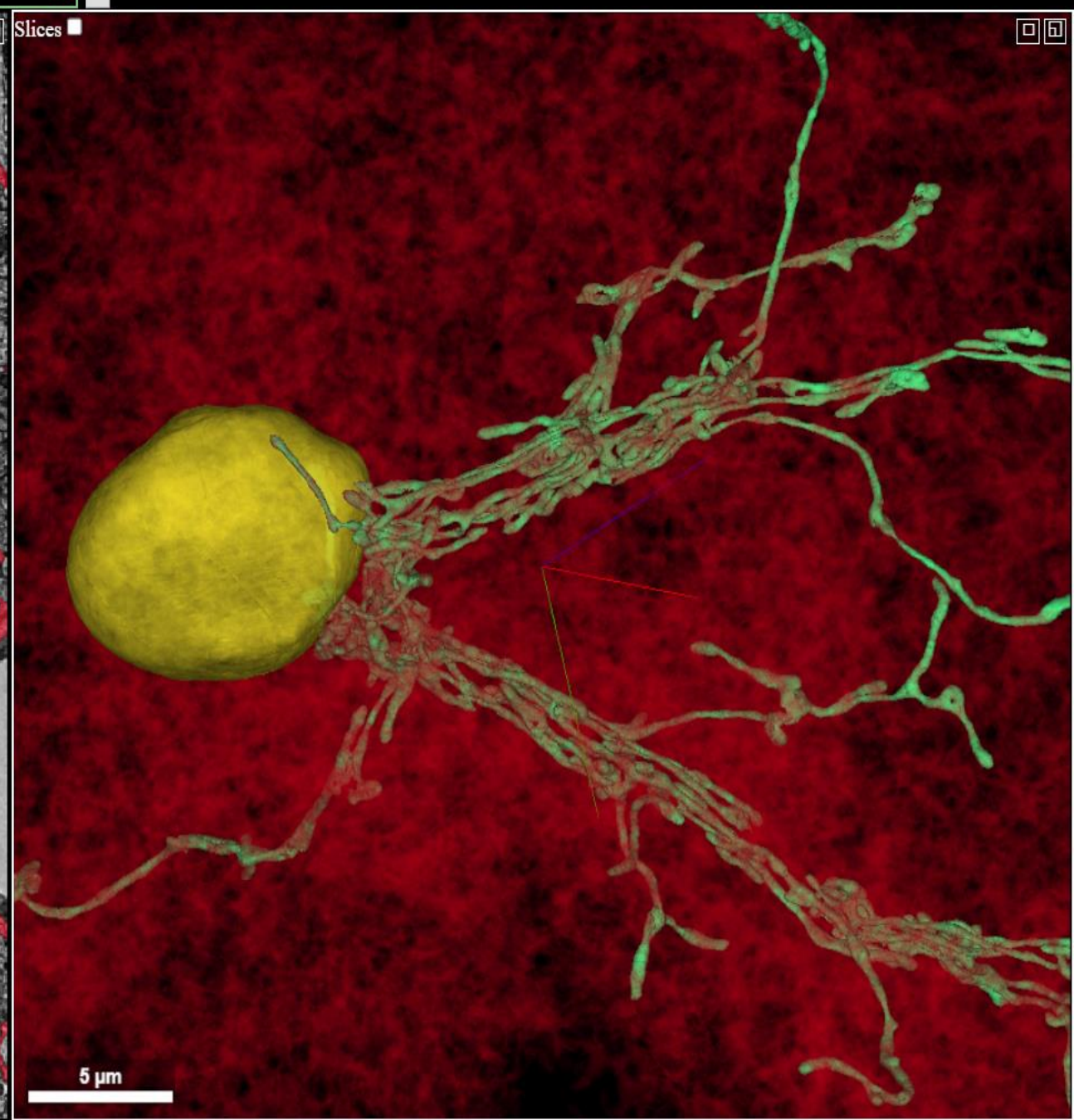
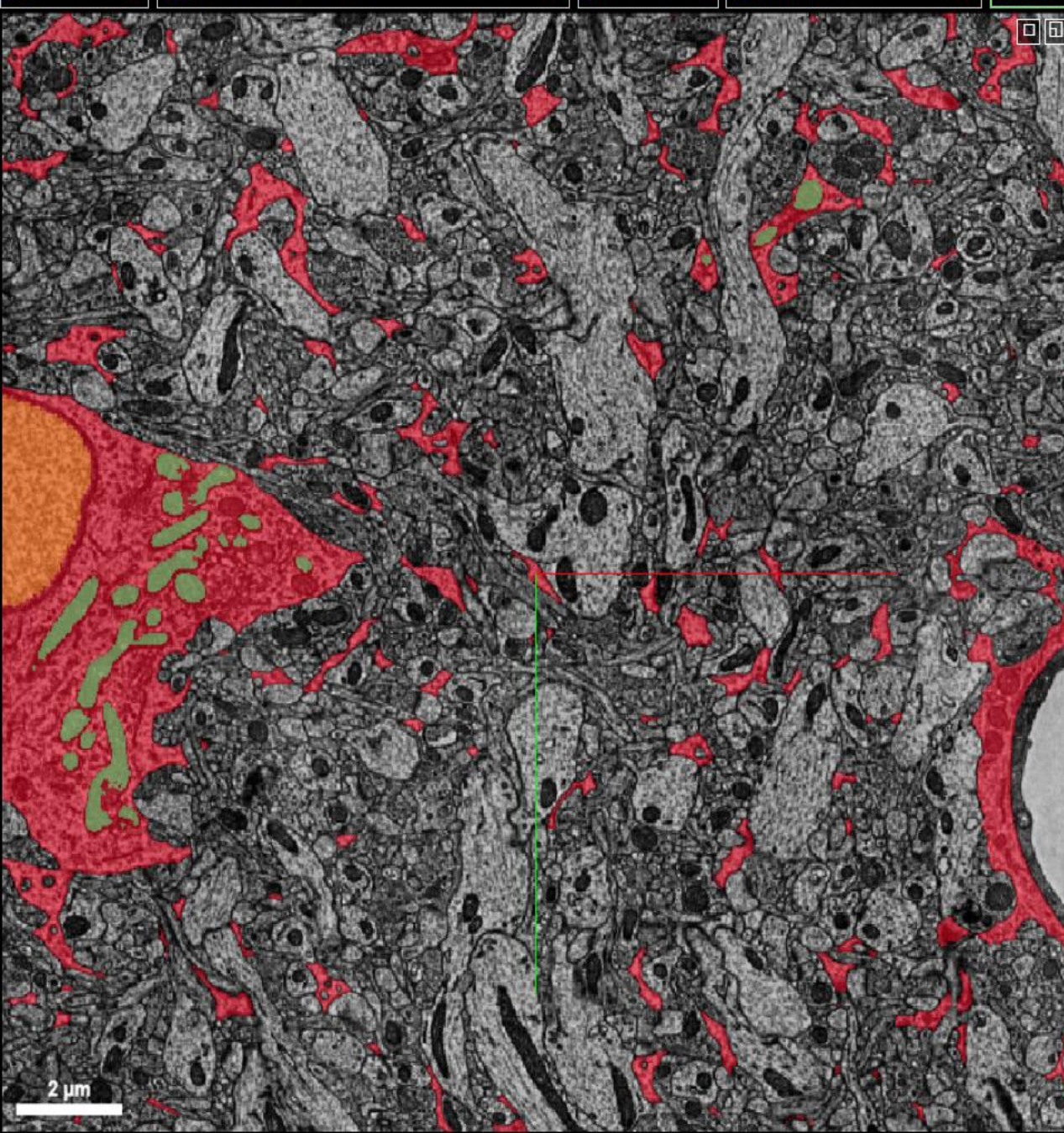


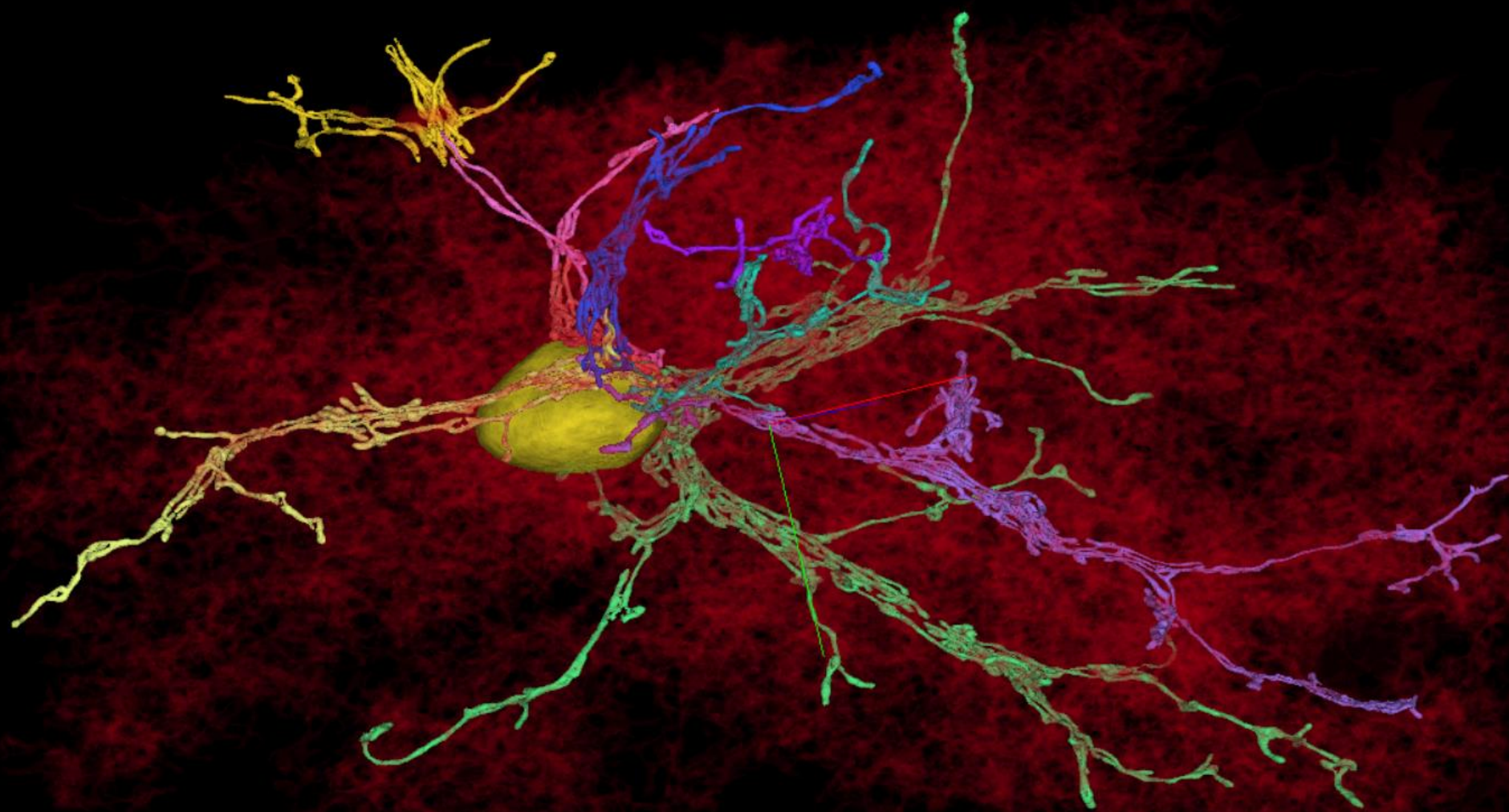
Has 31 mitochondria with voxel size above 2M



astrocyte 648518346349527319

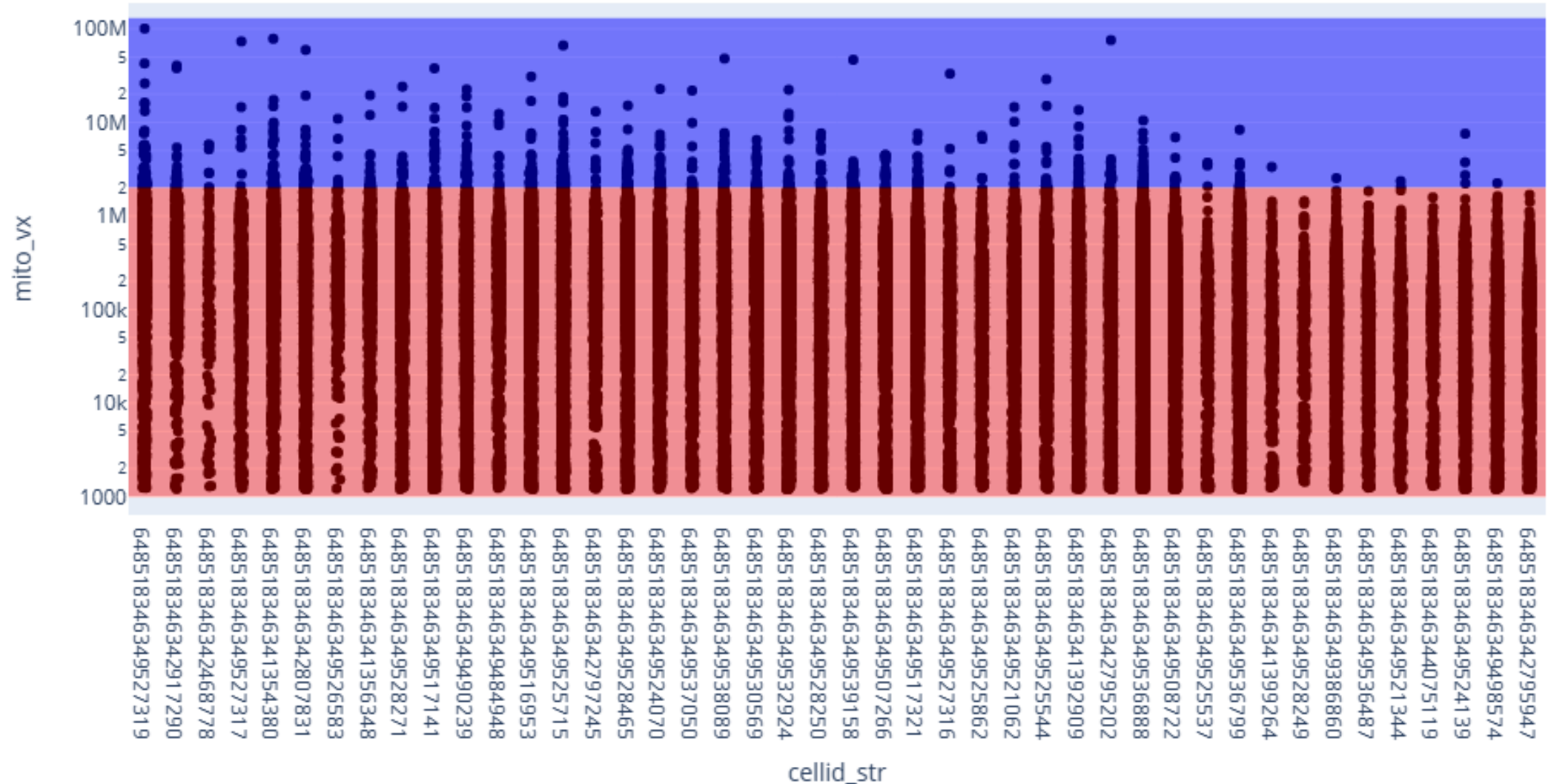
1EM x 2cell_segmentation_v185 x 3synapses x 4mitochondria x 5nuclei +





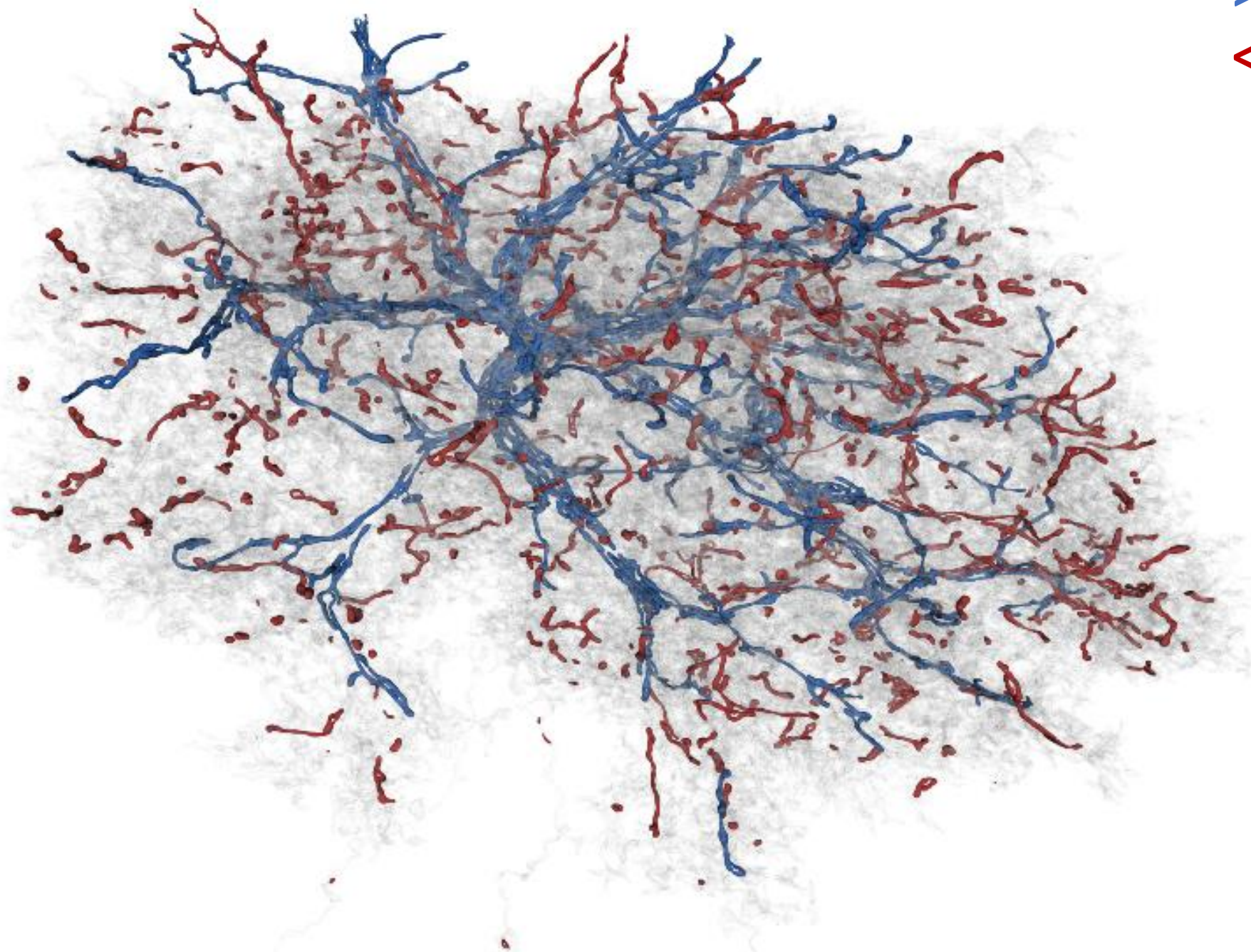
7.5 μm

Color mitochondria by continuous voxel size



>2M voxels

<2M voxels



8 μm

Acknowledgements



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Code Availability

Visit my [GitHub repository](#) to view how the images and data in this presentation were generated