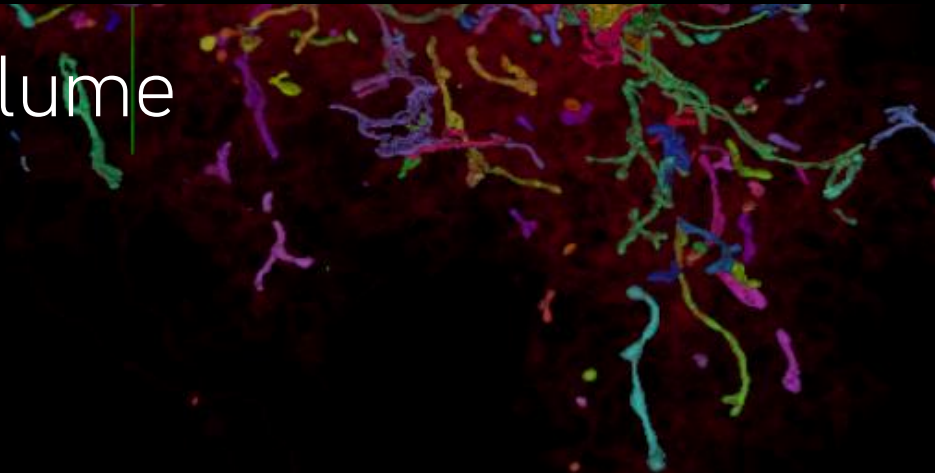


MITOCHONDRIA

Layer 2/3 Serial EM Volume



LARGEST MITOCHONDRION IN VOLUME BY VOXELS



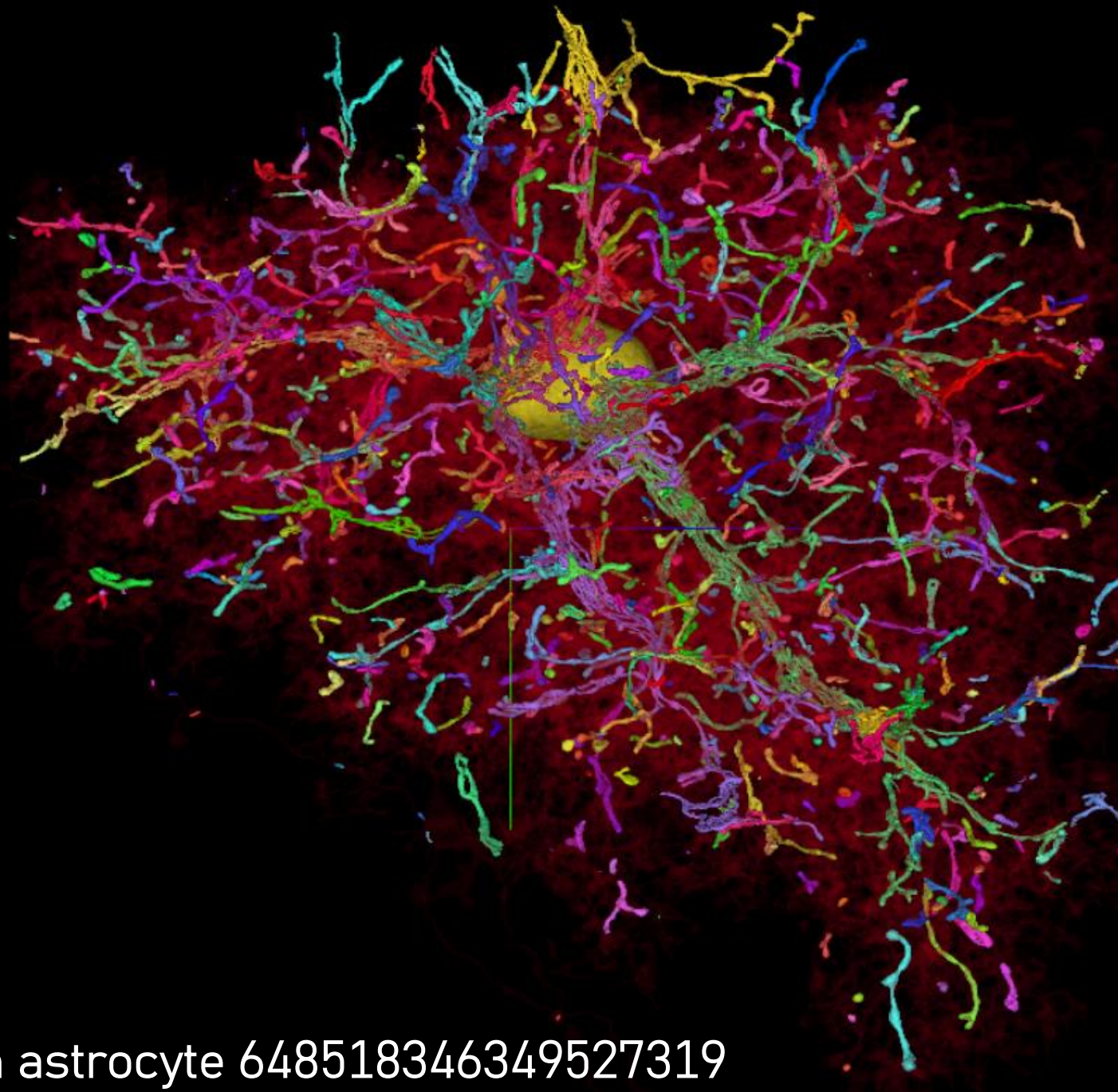
Astrocyte



Cell id 648518346349527319



Mito id 866030



all mitochondria in astrocyte 648518346349527319

ASTROCYTE

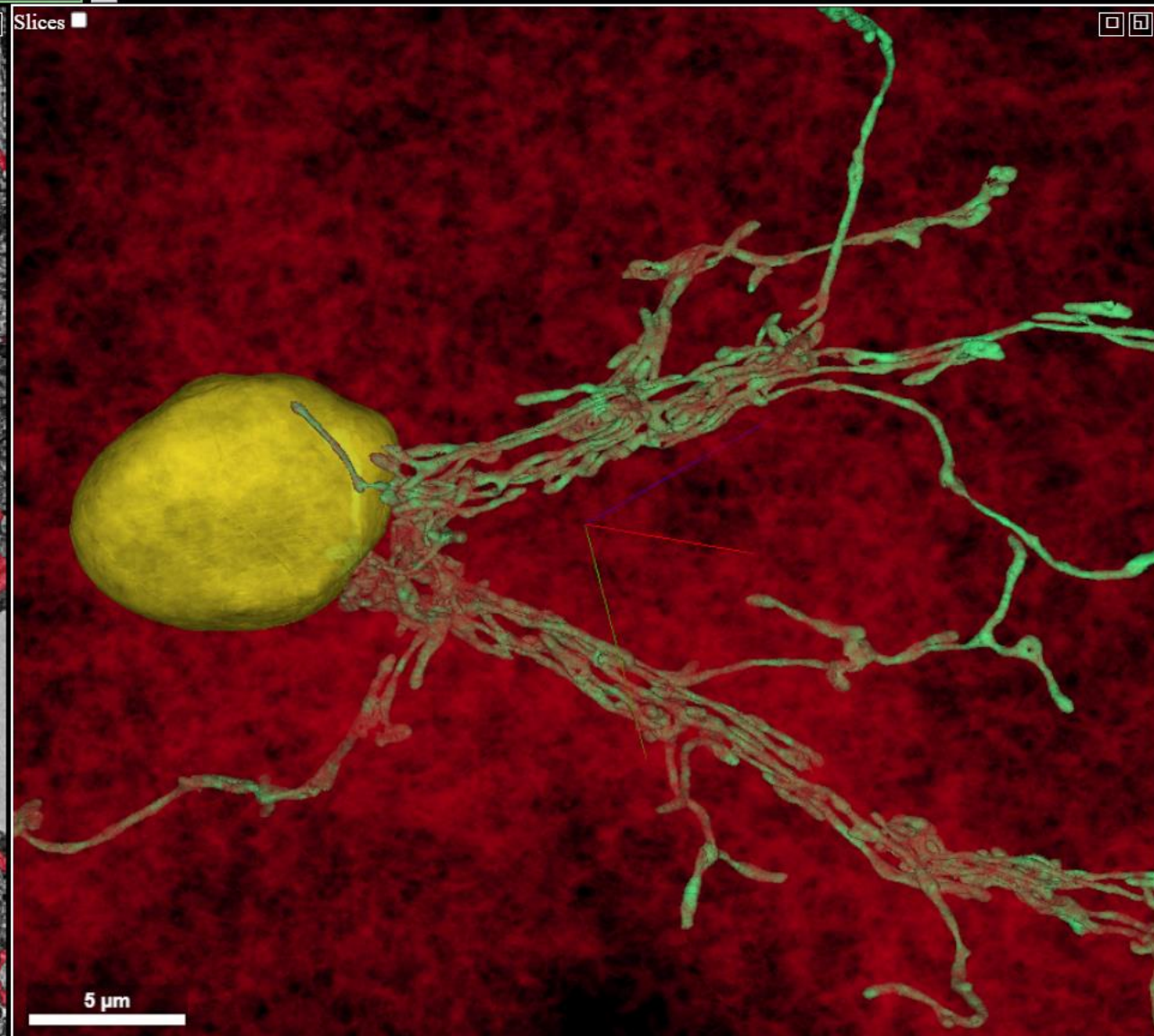
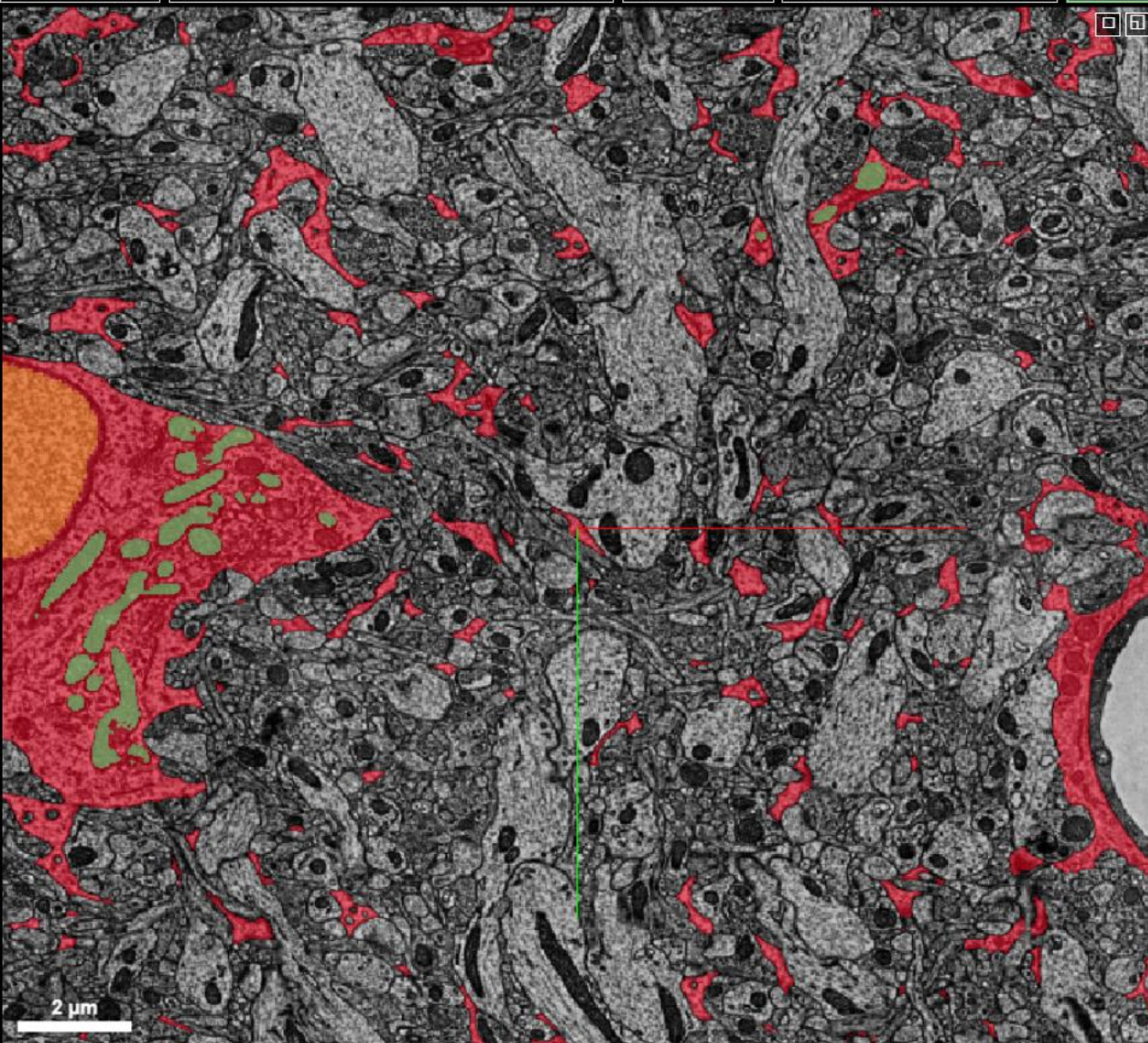
648518346349527319

- Contains the largest contiguous mitochondrion (mito id 866030) in the Layer 2/3 volume

4x4x40 nm³ x 64613, y 40665, z 1446

Share \$ 0 ? !

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

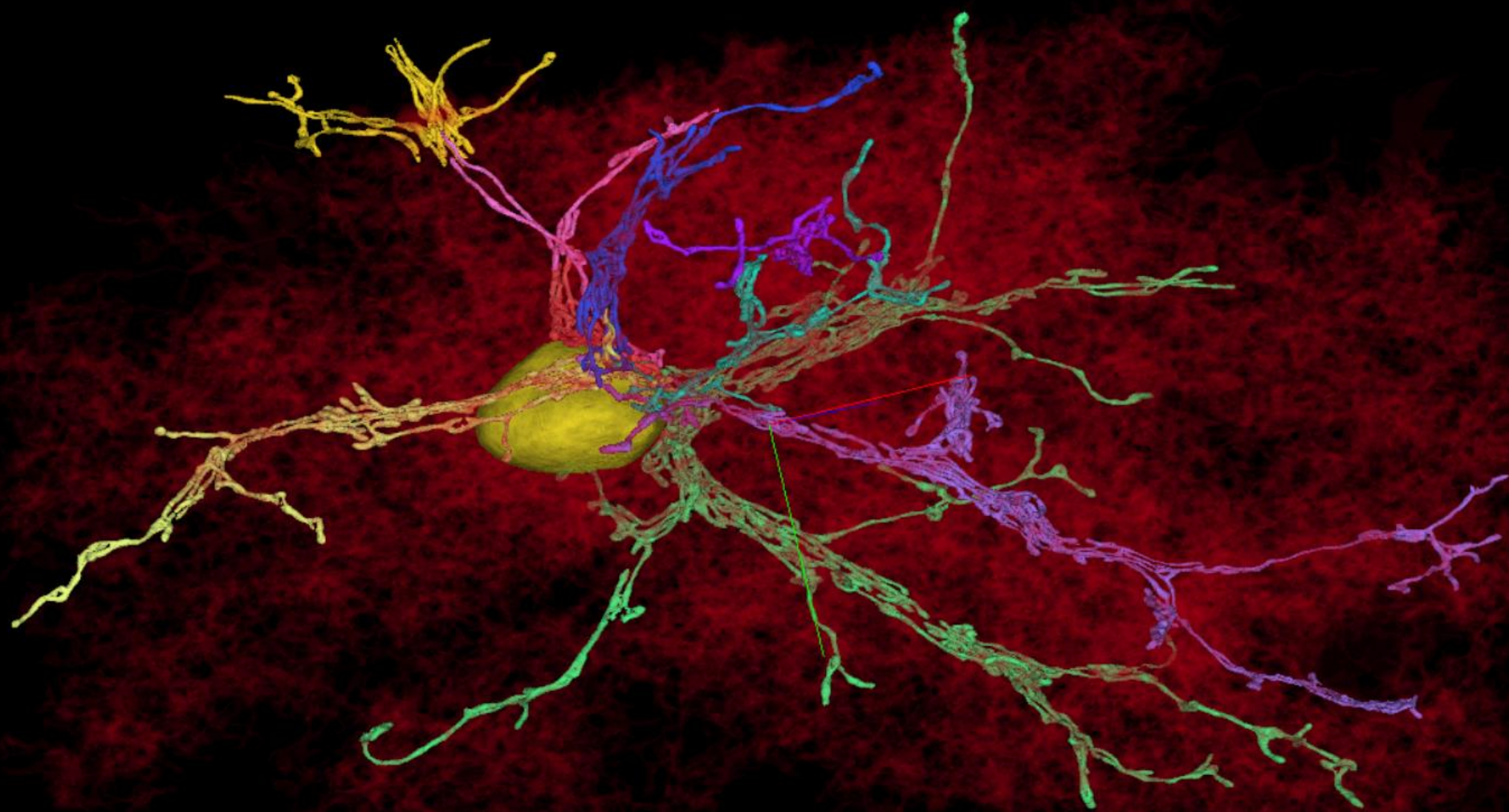


largest contiguous mitochondrion in the entire volume (astrocyte 648518346349527319)

ASTROCYTE

648518346349527319

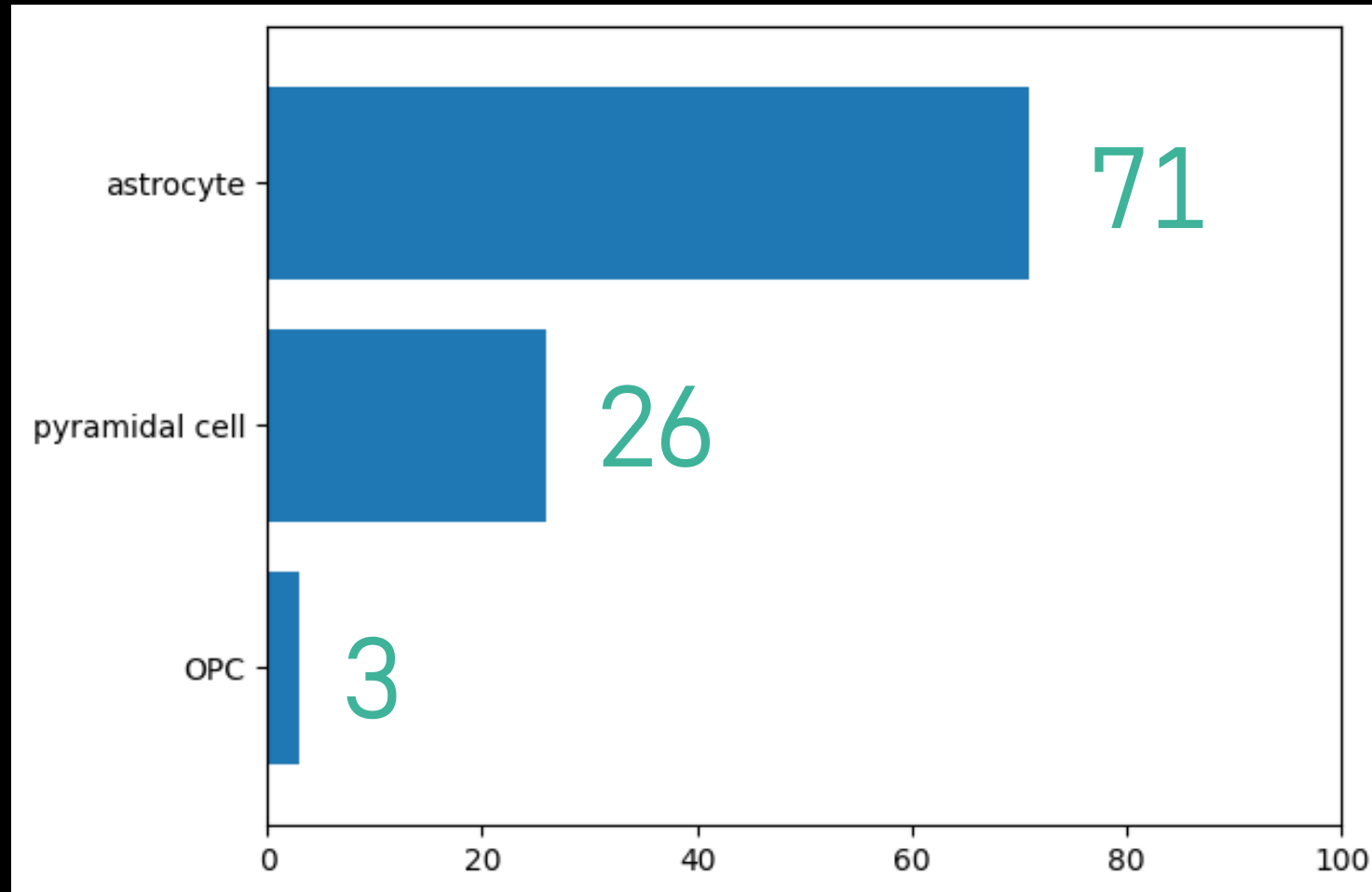
- Also contains 9 highly branched mitochondria
(mito ids 866030, 1083380, 854433, 1083414,
1083667, 739489, 1077732, 961982, 1304222)



7.5 μm

OF THE TOP 100* MITO BY VOXELS MOST ARE IN ASTROCYTES

*for cells identified in the cell subtype table



LARGEST MITOCHONDRIUM IN A NEURON IN THE VOLUME



Excitatory pyramidal neuron

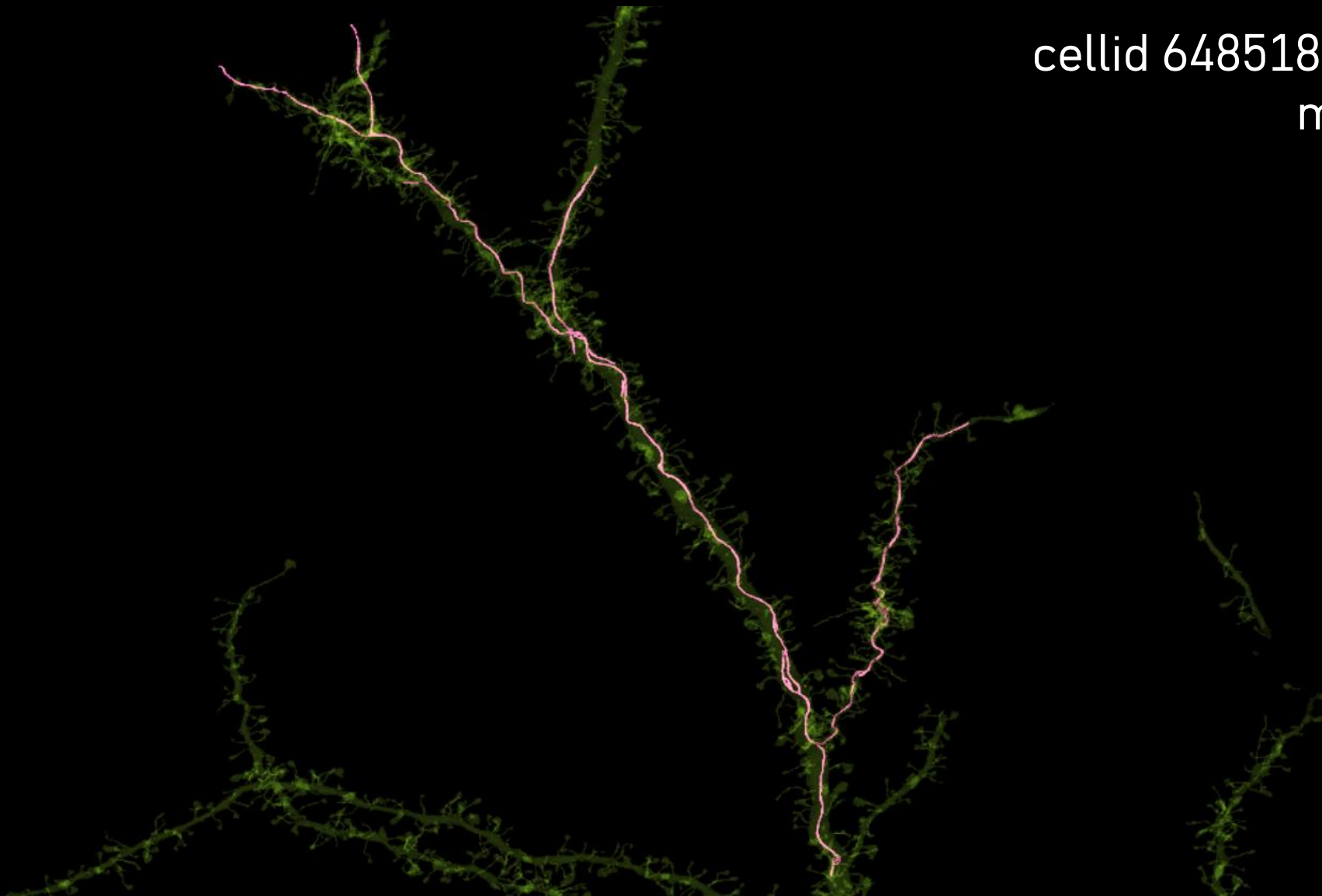


Cell id 648518346349537741



Mito id 2130887

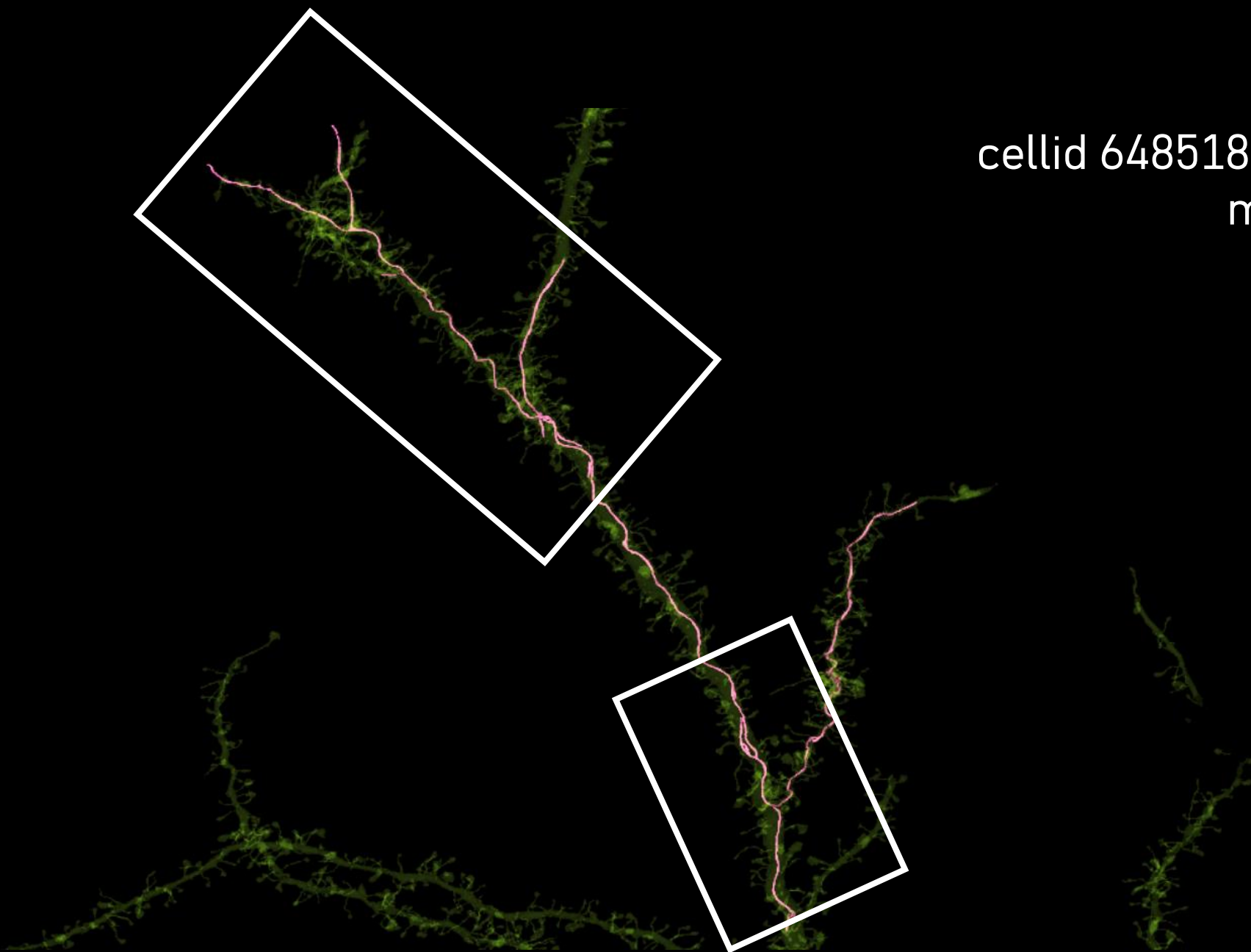
cellid 648518346349537741
mitoid 2130887



10 μm

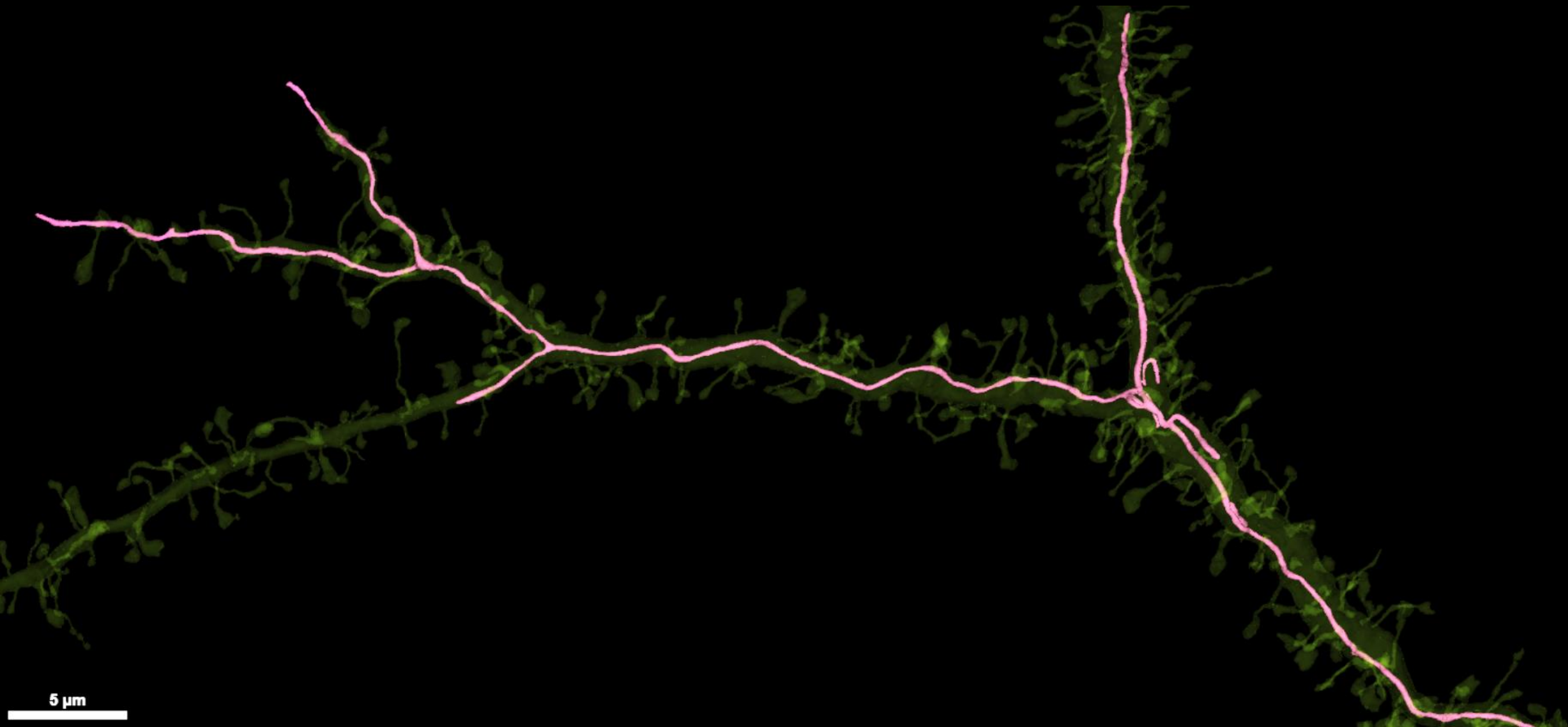
largest contiguous mitochondrion in a neuron

cellid 648518346349537741
mitoid 2130887



10 μ m

largest contiguous mitochondrion in a neuron





5 μm

LARGE DENDRITIC MITOCHONDRION



Excitatory pyramidal apical dendrite

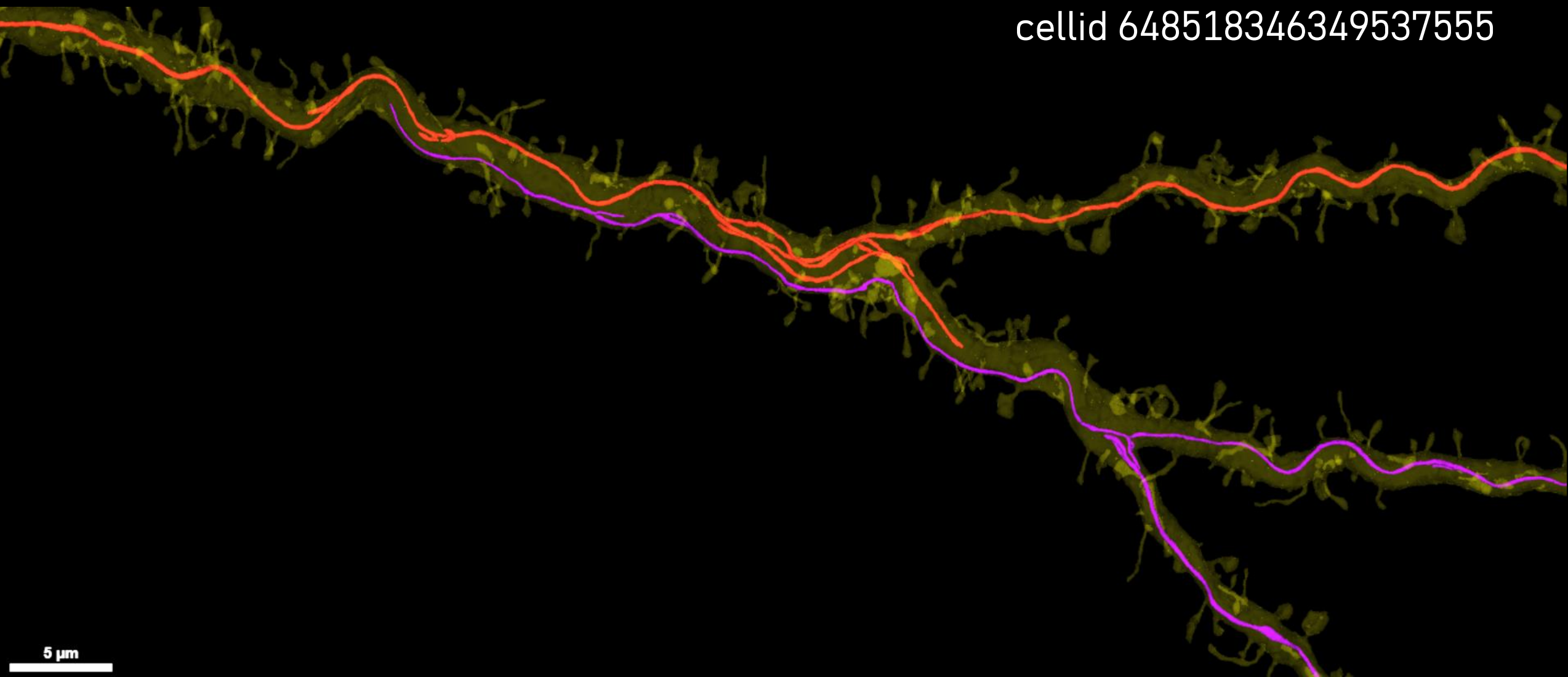


Cell id 648518346349537555



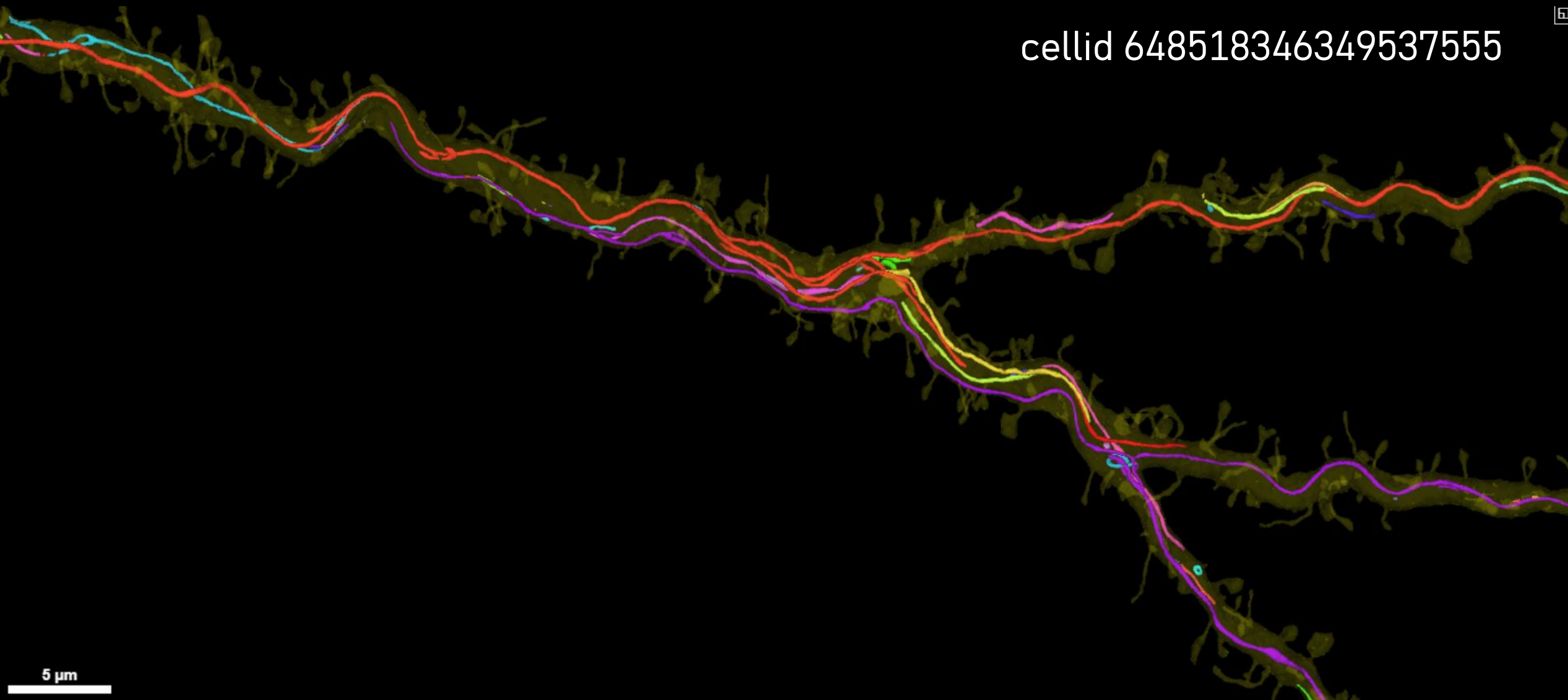
Mito ids 2703814 and 2974242

cellid 648518346349537555



two large mitochondria in a neurite (soma not in volume)

cellid 648518346349537555



all mitochondria in this part of the neurite (soma not in volume)

ANOTHER LARGE DENDRITIC MITOCHONDRIUM



Excitatory pyramidal neuron

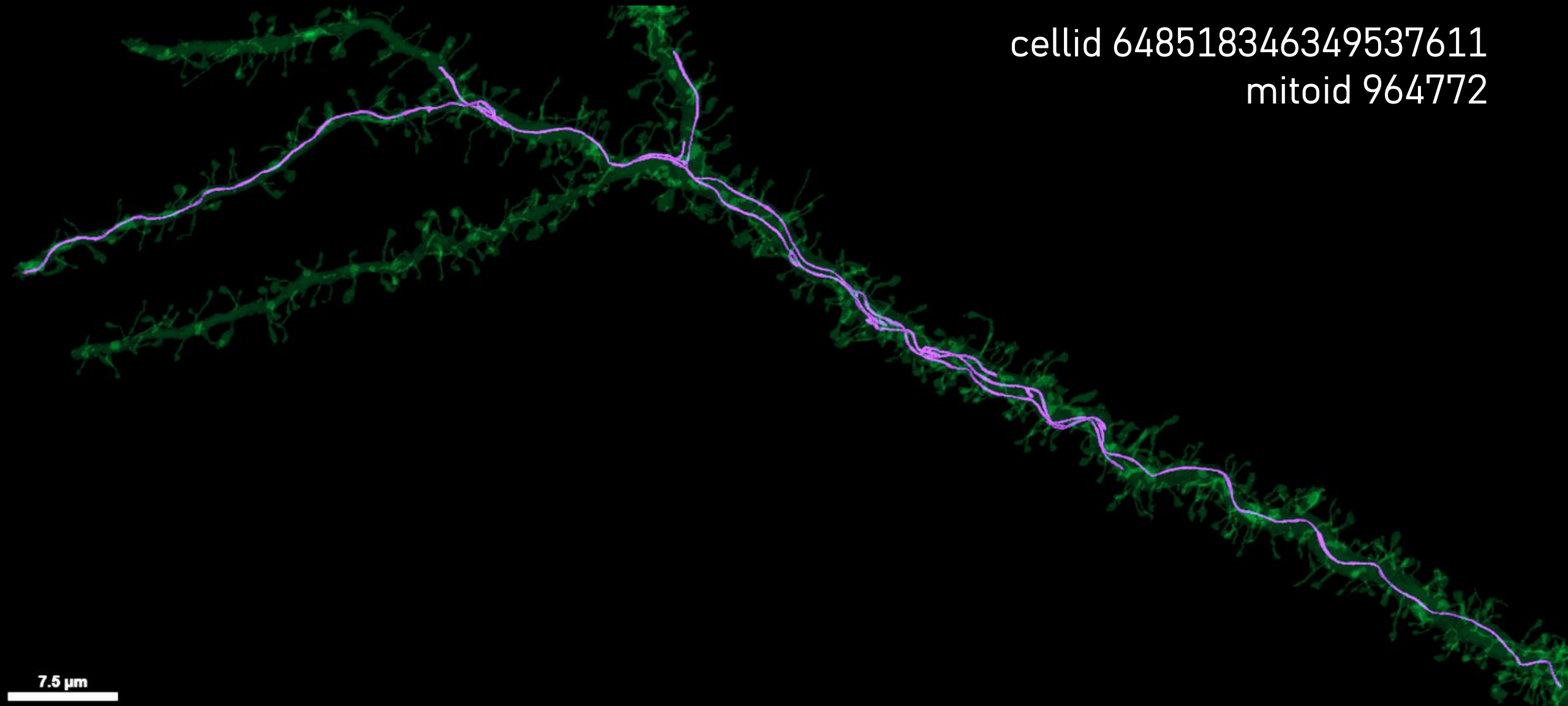


Cell id 648518346349537611



Mito id 964772

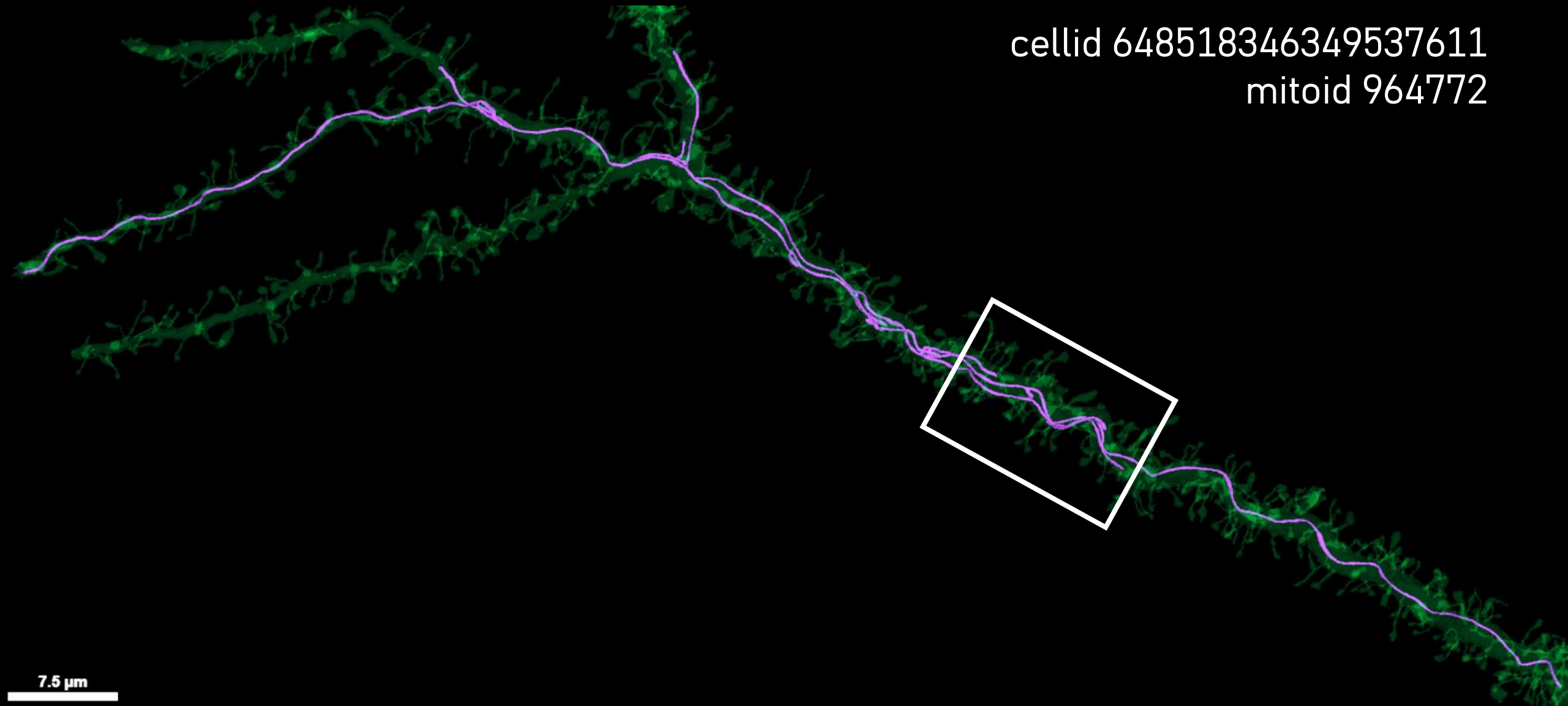
cellid 648518346349537611
mitoid 964772



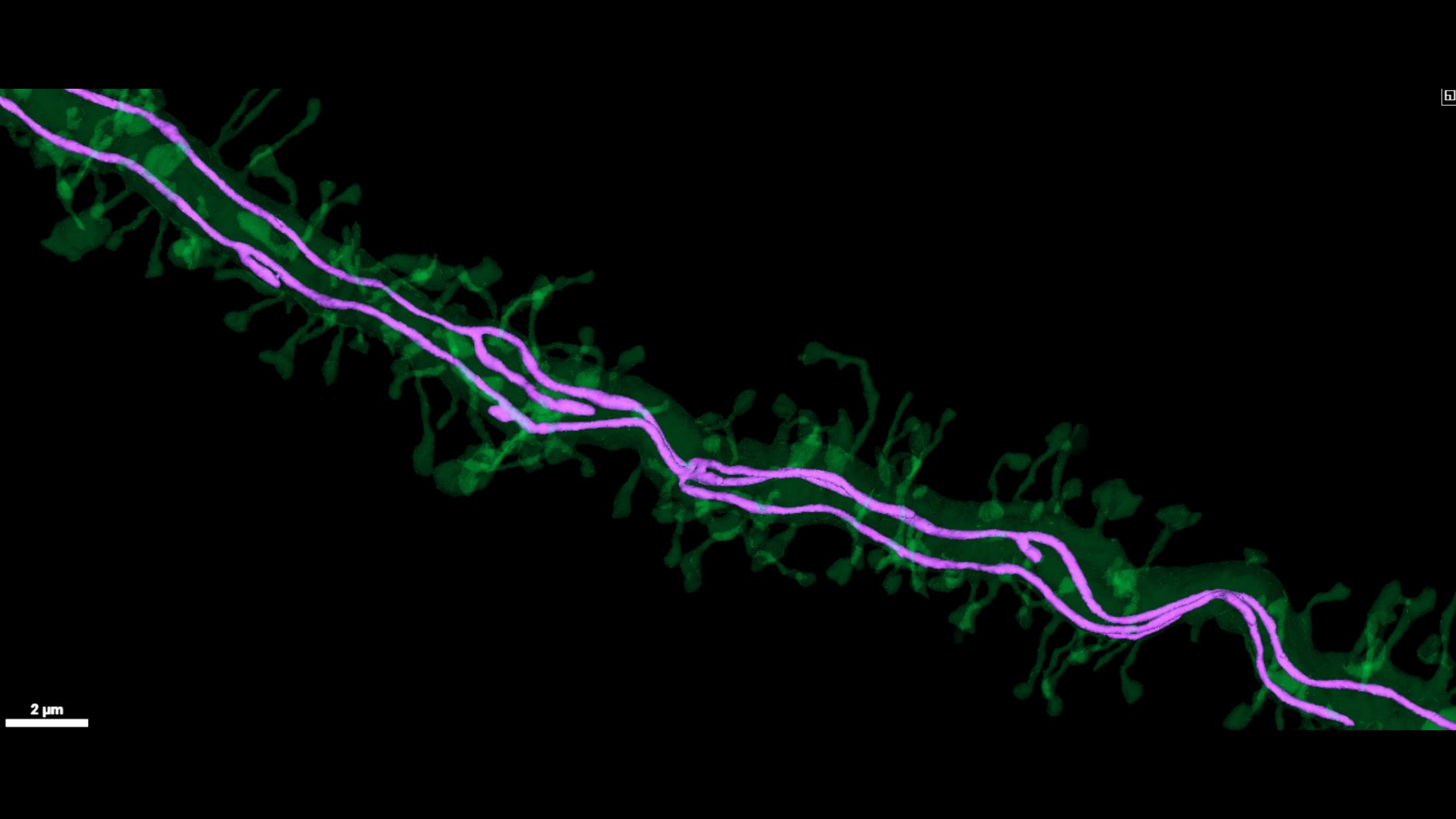
7.5 μm

another large contiguous mitochondrion in a neuron

cellid 648518346349537611
mitoid 964772



another large contiguous mitochondrion in a neuron



2 μm

LARGEST MITOCHONDRION IN AN OPC GLIAL CELL



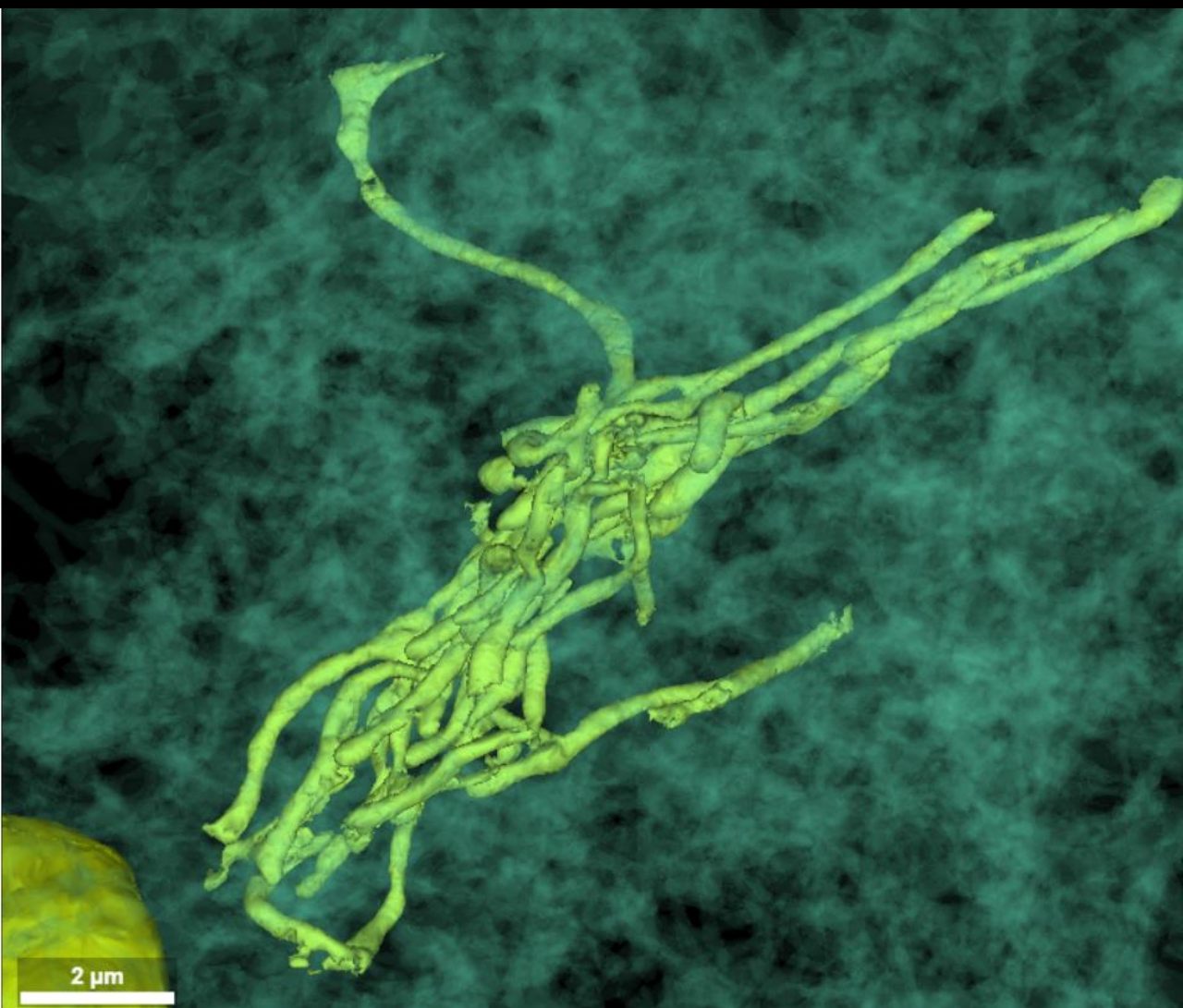
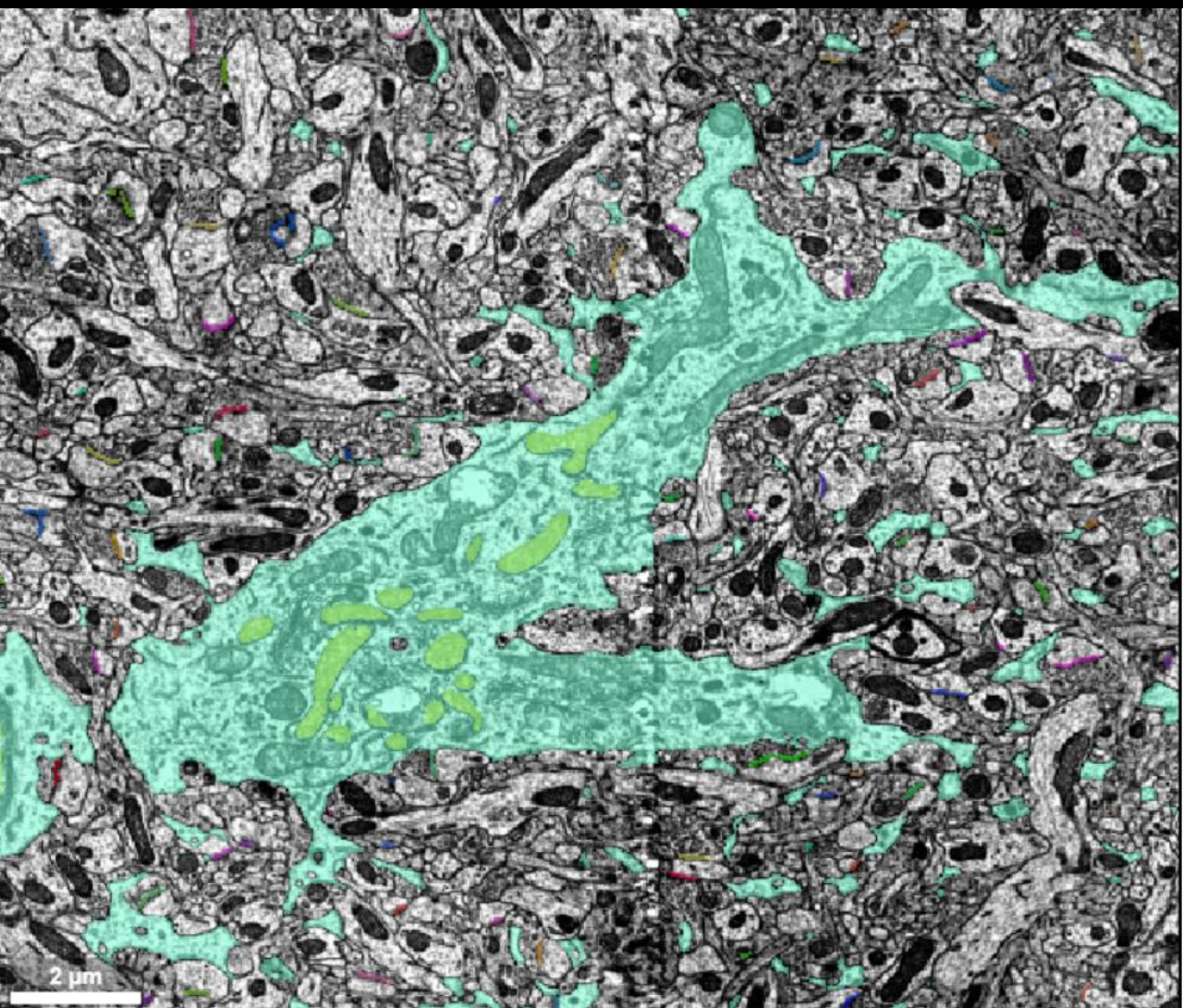
Oligodendrocyte Precursor Cell (OPC)



Cell id 648518346349525545



Mito id 2187341



largest mitochondrion by voxels in an OPC glial cell (648518346349525545)

THE HIGHEST NUMBER OF MITOCHONDRIA IN A CELL



Inhibitory basket neuron



Cell id 648518346349539215



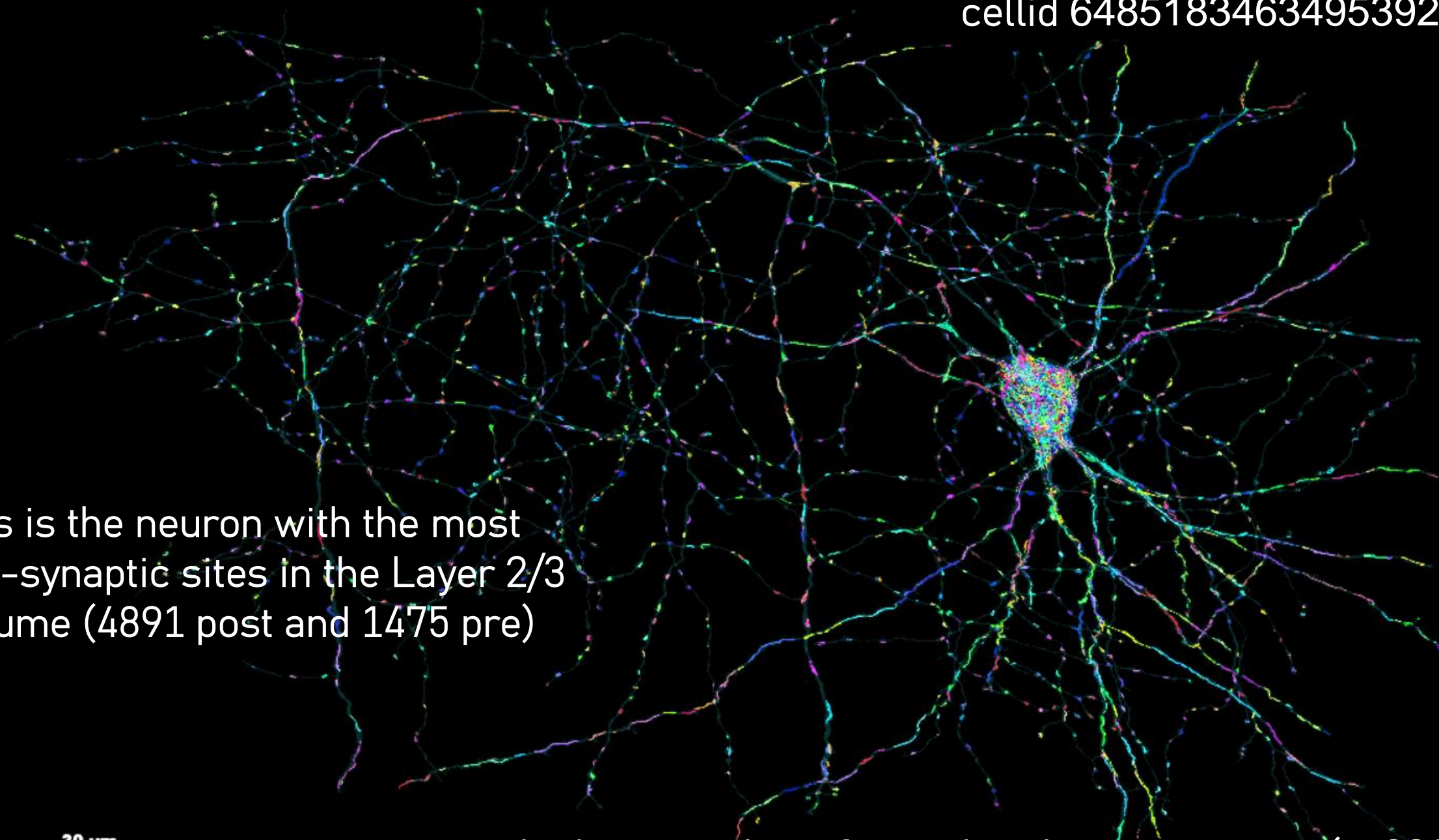
Mitochondria count $n = 3213$

cellid 648518346349539215

This is the neuron with the most
pre-synaptic sites in the Layer 2/3
volume (4891 post and 1475 pre)

30 μ m

highest number of mitochondria in a neuron (n=3213)



longer mito length in dendrites

cellid 648518346349539215

smaller mito size in axons

7.5 μ m

A fluorescence microscopy image of a neuron. The cell body (soma) is centrally located and filled with a dense, multi-colored network of mitochondria. Numerous long, thin processes (dendrites and axons) extend from the soma. These processes contain smaller, more discrete, multi-colored mitochondrial segments. The background is black. A white scale bar in the bottom left corner indicates 7.5 μm. Text annotations are present: 'longer mito length in dendrites' at the top left, 'cellid 648518346349539215' at the top right, and 'smaller mito size in axons' in the middle left.

A HIGH NUMBER OF MITOCHONDRIA IN A CELL



Astrocyte



Cell id 648518346349536888



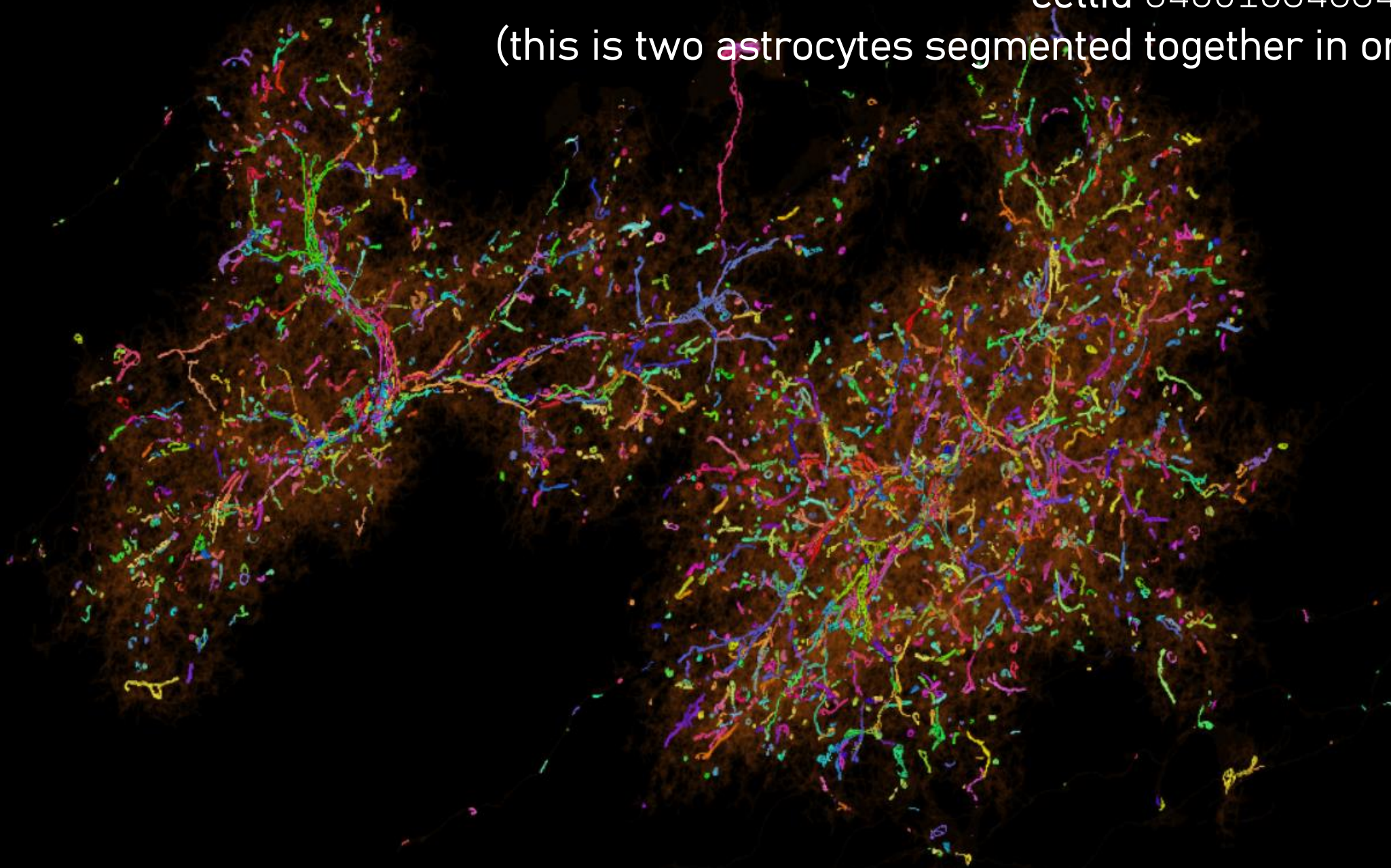
Mitochondria count $n = 3173$

cellid 648518346349536888

(this is two astrocytes segmented together in one cellid)

15 μm

highest number of mitochondria in an astrocyte (n=3173)



A HIGH NUMBER OF MITOCHONDRIA IN A CELL



Inhibitory basket neuron



Cell id 648518346349528994

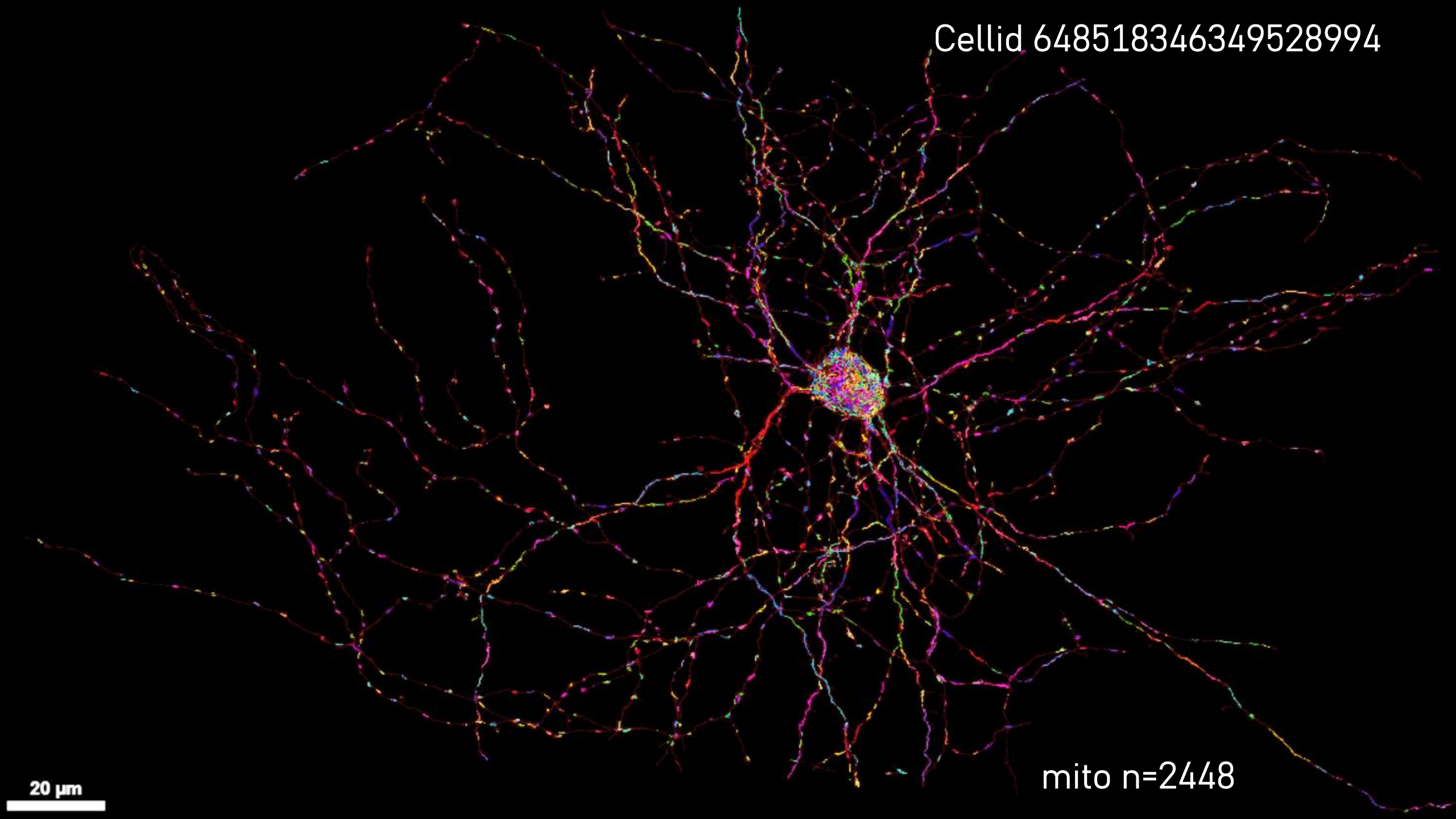


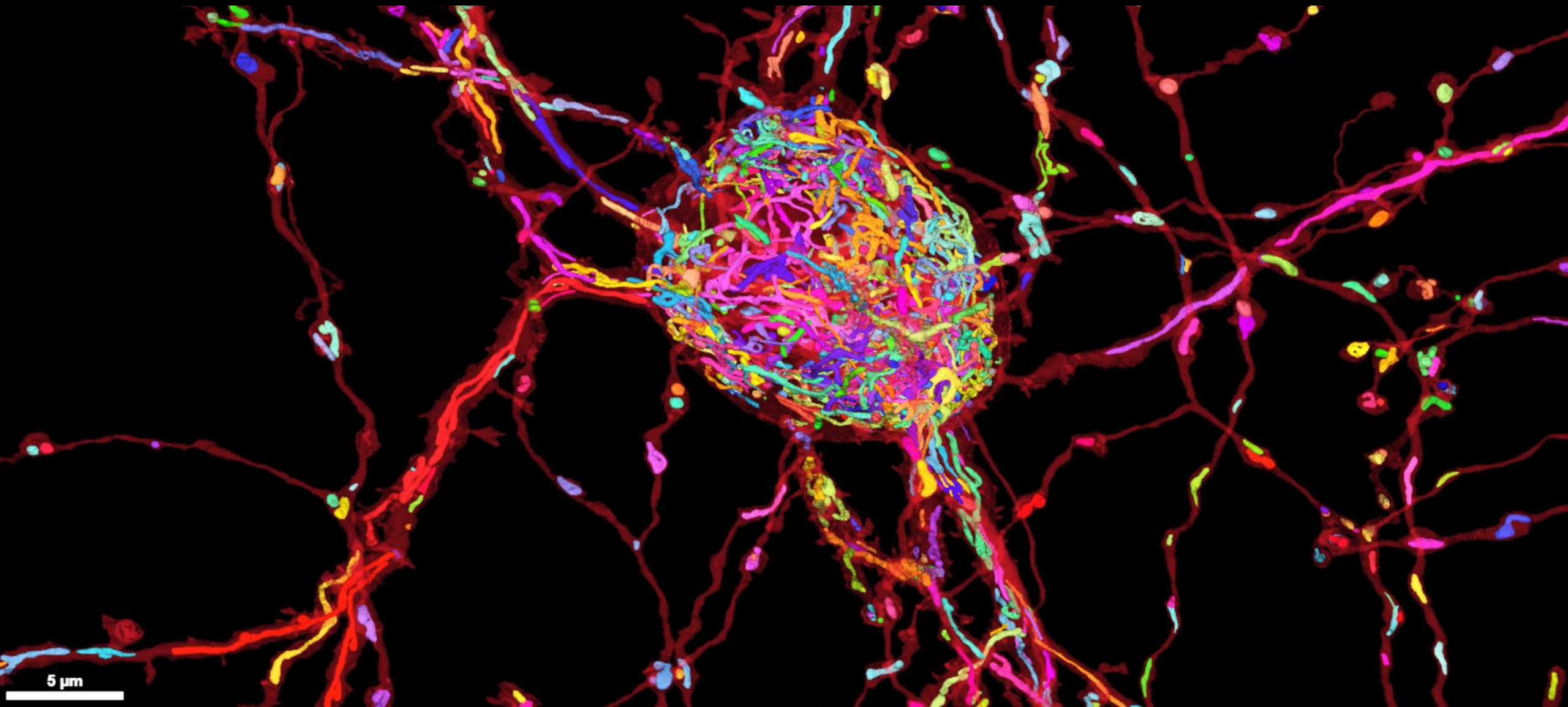
Mitochondria count $n = 2448$

Cellid 648518346349528994

20 μ m

mito n=2448





A HIGH NUMBER OF MITOCHONDRIA IN A CELL



Astrocyte

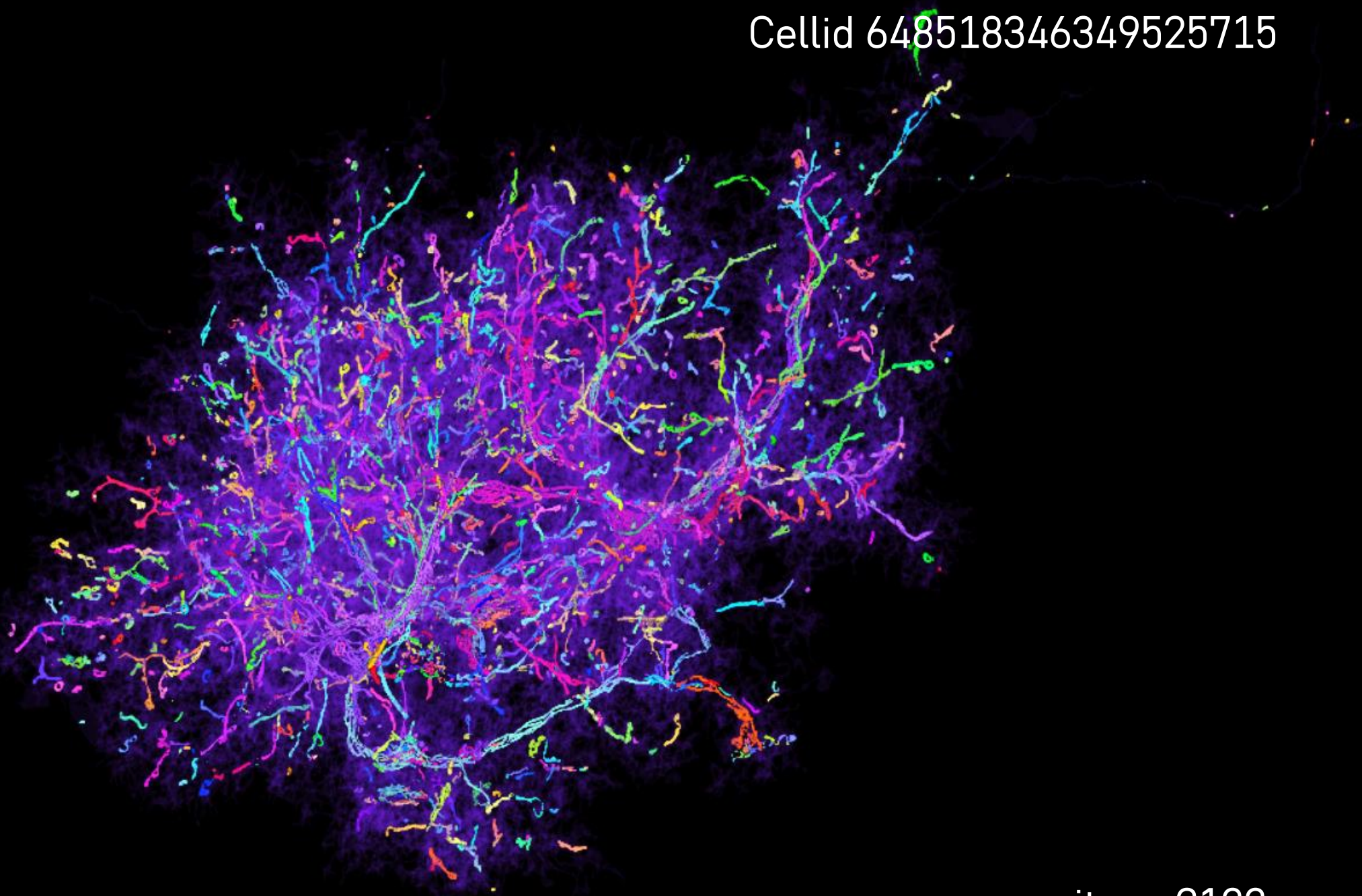


Cell id 648518346349525715



Mitochondria count $n = 2133$

Cellid 648518346349525715



15 μm

mito n=2133

A HIGH NUMBER OF MITOCHONDRIA IN A CELL



Inhibitory basket neuron



Cell id 648518346349538791



Mitochondria count $n = 2114$

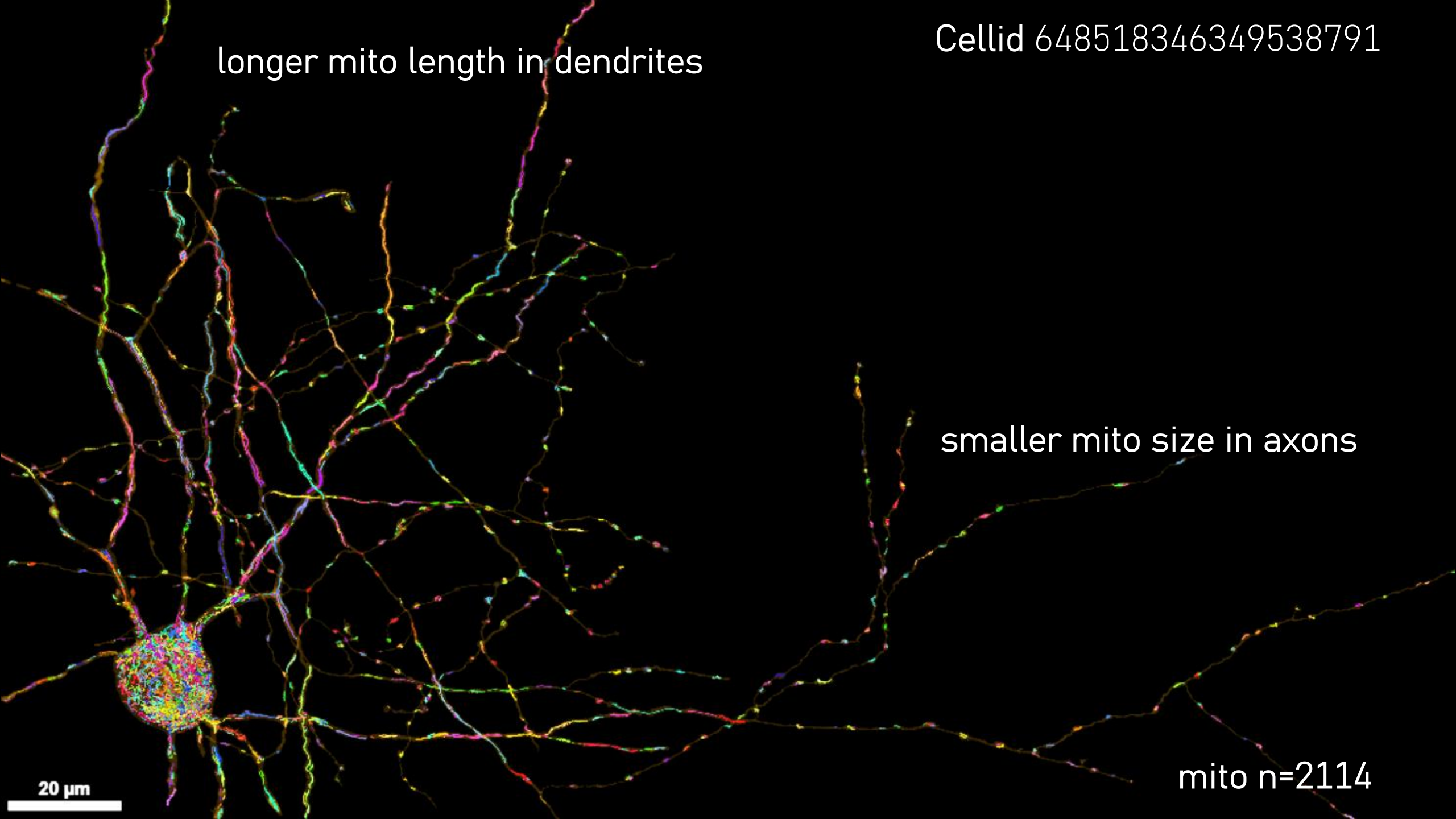
Cellid 648518346349538791

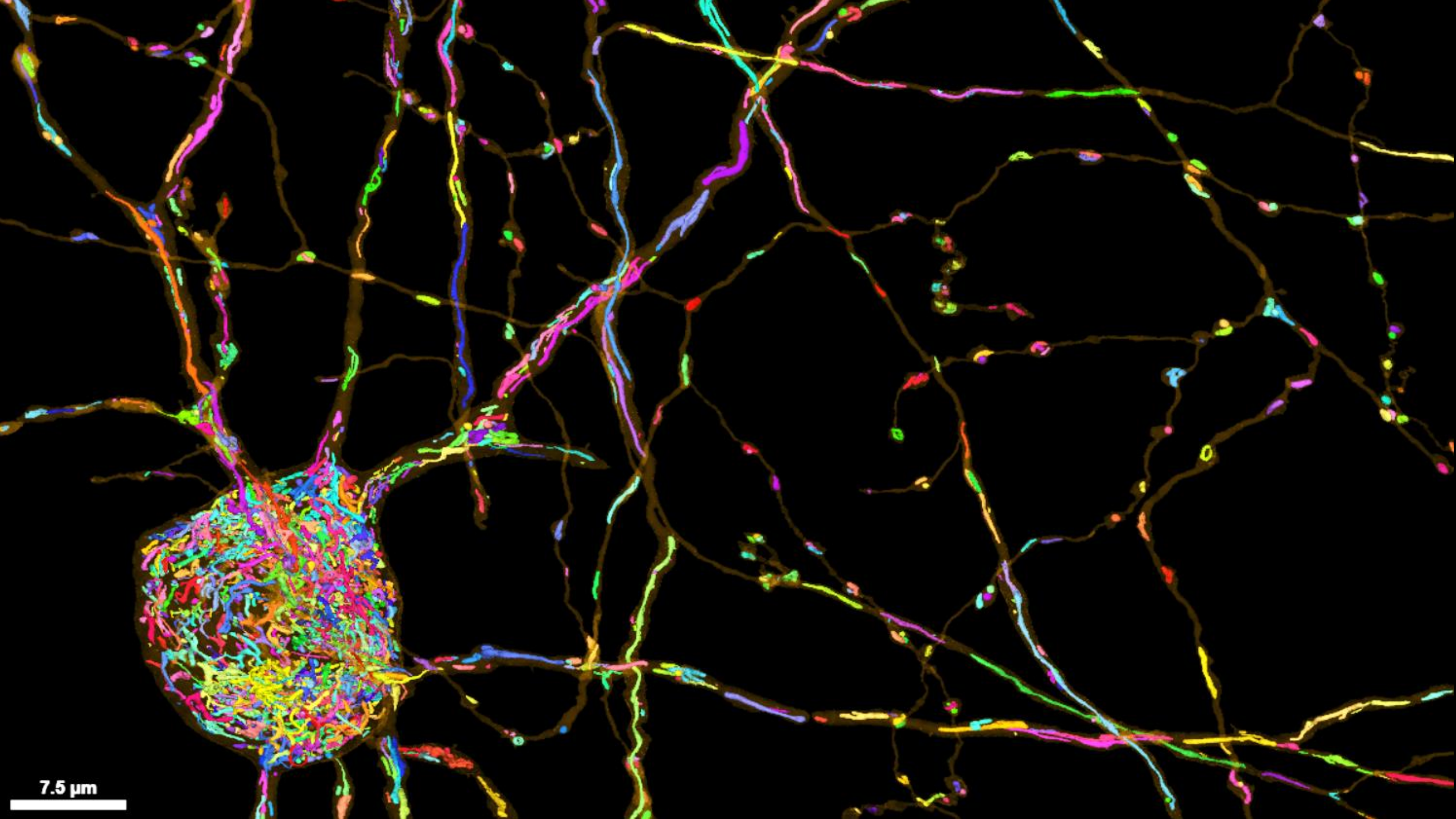
longer mito length in dendrites

smaller mito size in axons

20 μ m

mito n=2114





7.5 μm

A HIGH NUMBER OF MITOCHONDRIA IN A CELL



Inhibitory neuron of unknown type

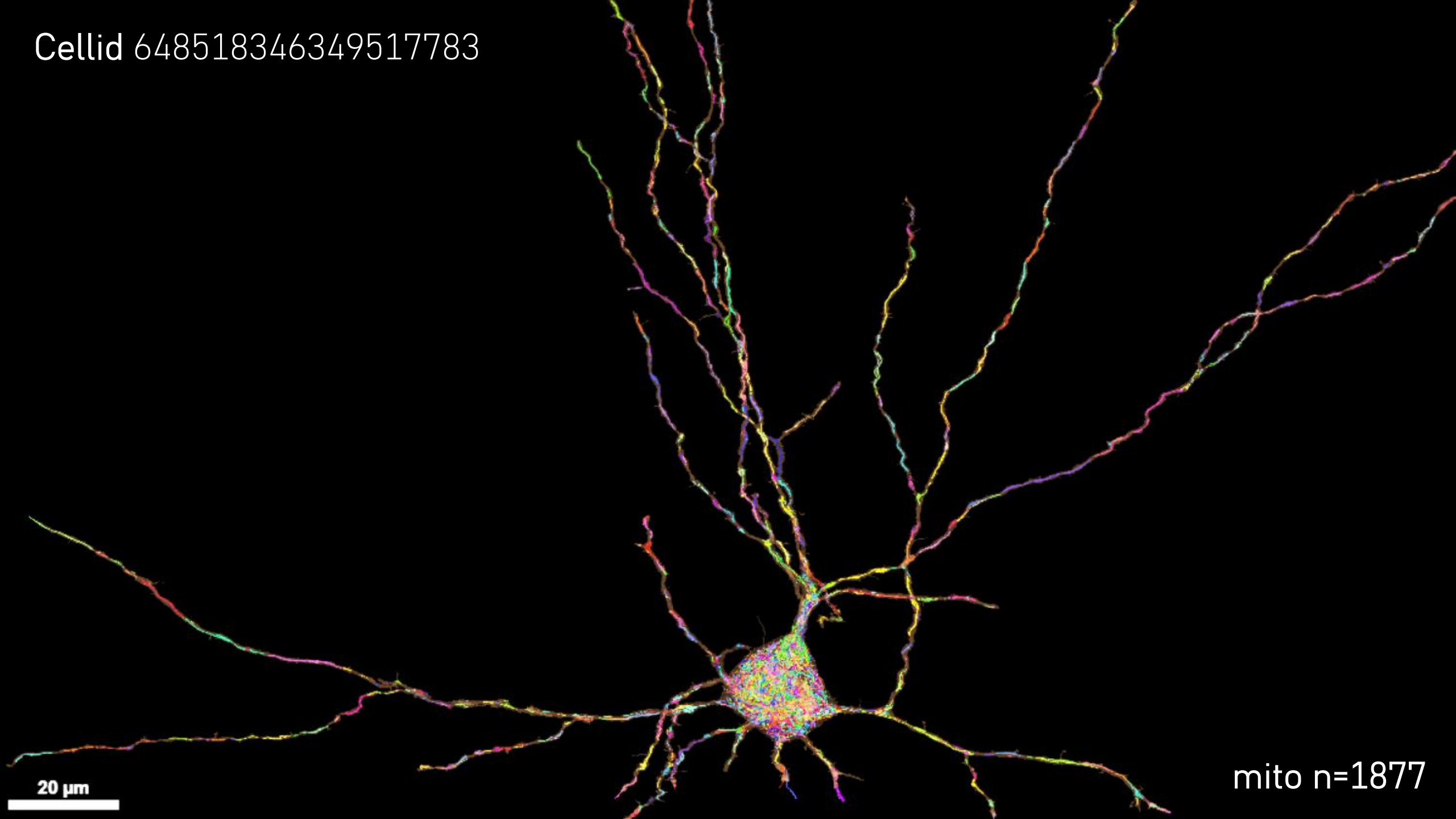


Cell id 648518346349517783



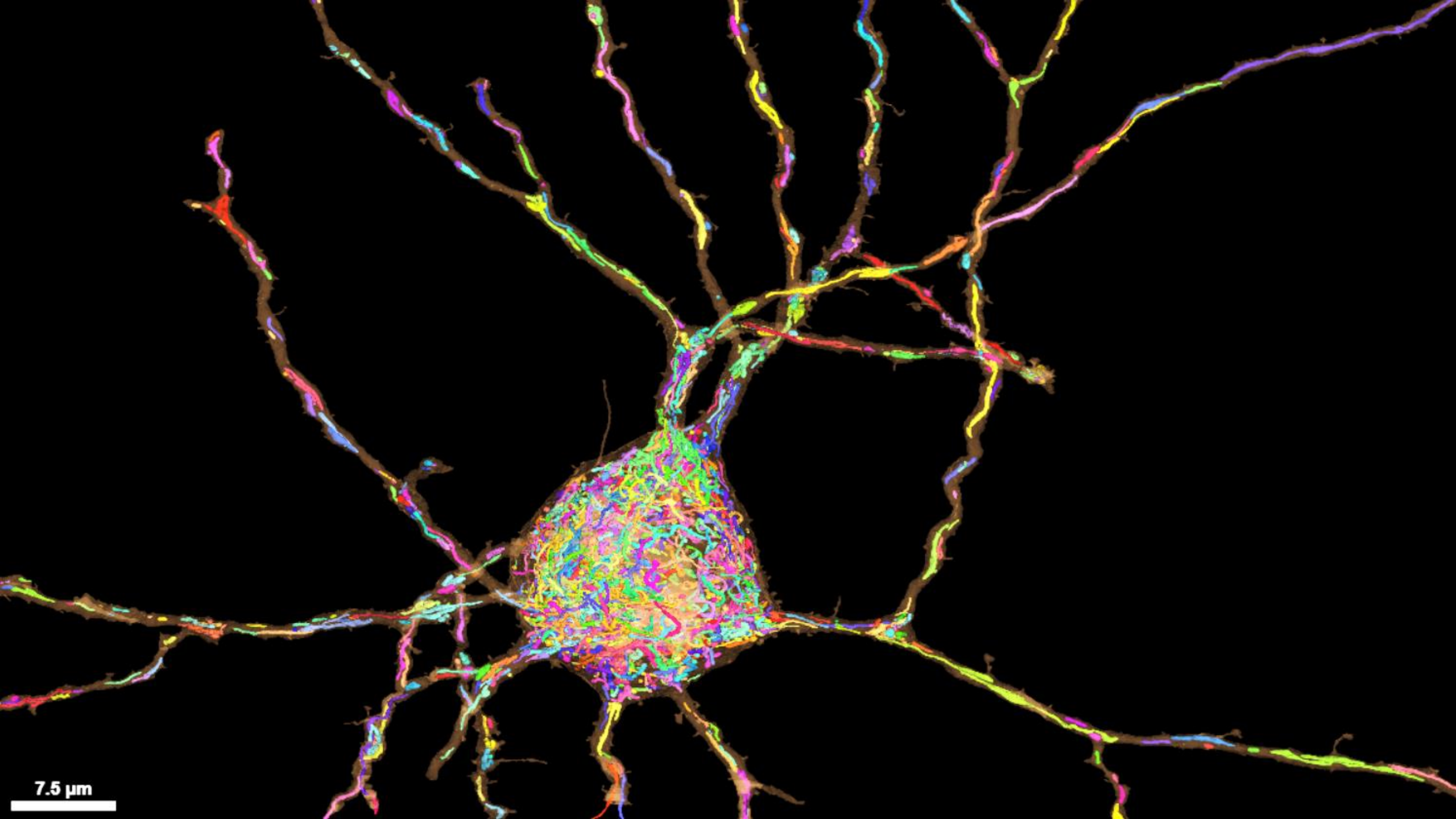
Mitochondria count $n = 1877$

Cellid 648518346349517783



20 μm

mito n=1877



7.5 μm

A HIGH NUMBER OF MITOCHONDRIA IN A CELL



Inhibitory basket neuron

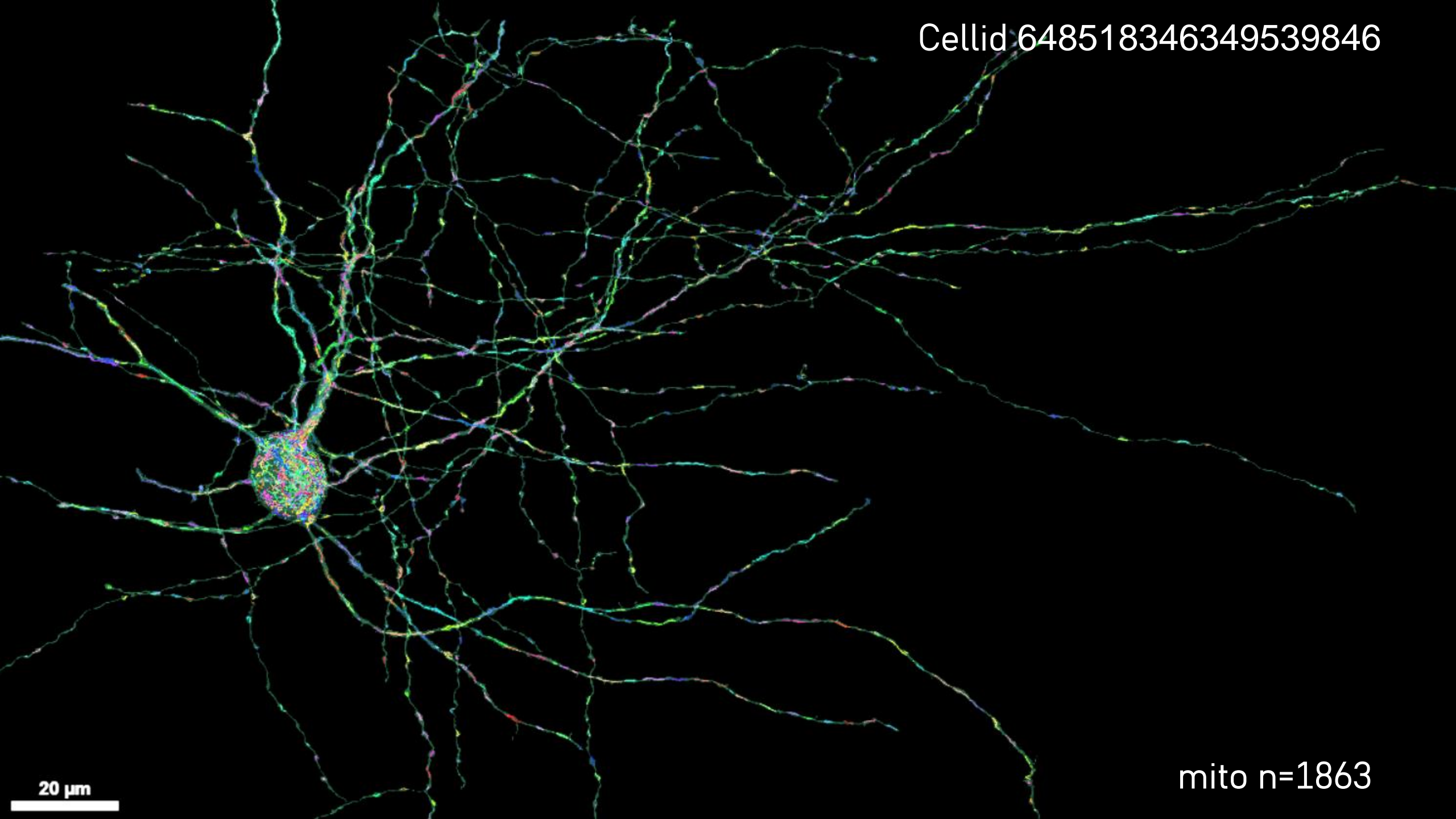


Cell id 648518346349539846



Mitochondria count $n = 1863$

Cellid 648518346349539846



20 μm

mito n=1863

A HIGH NUMBER OF MITOCHONDRIA IN A CELL



Inhibitory neurogliaform interneuron

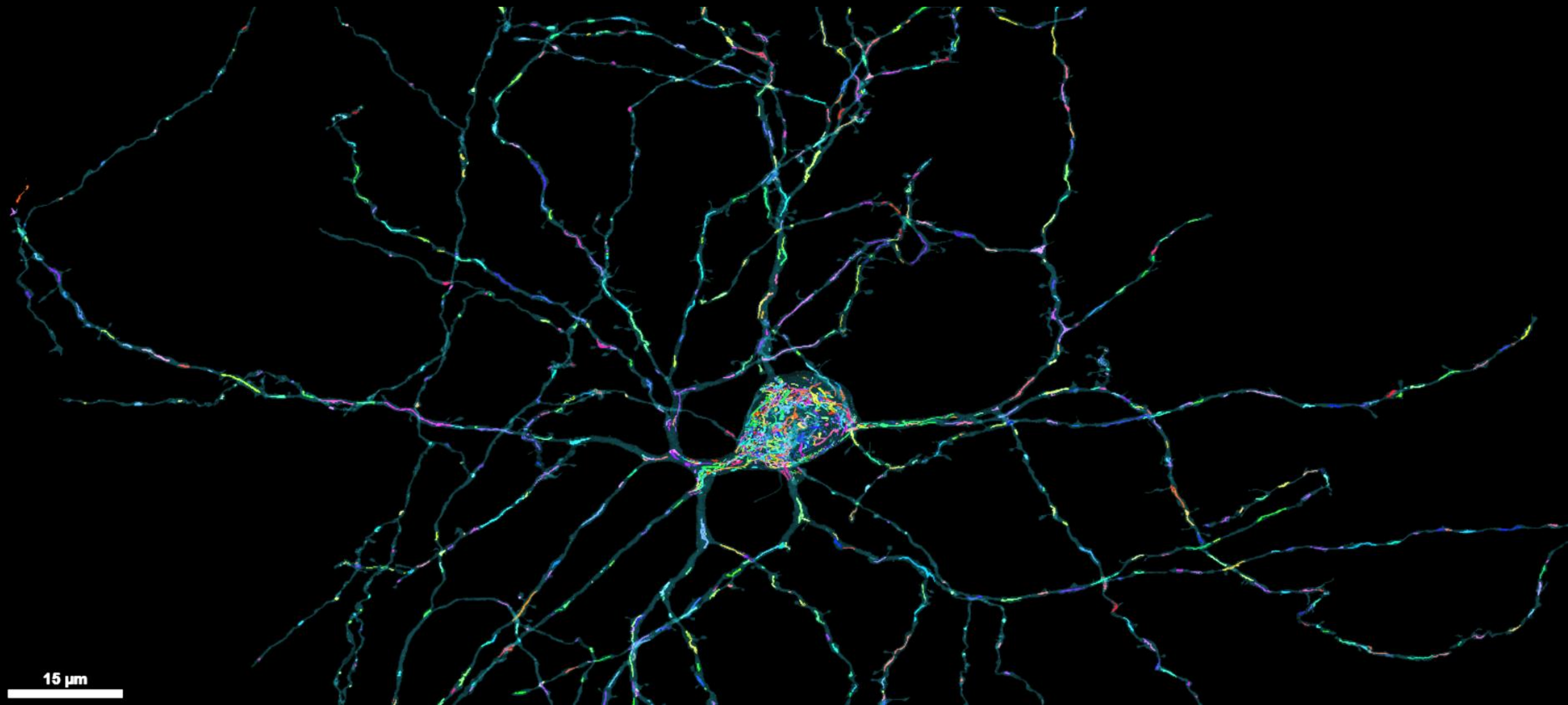


Cell id 648518346349538789



Mitochondria count $n = 1356$

Cellid 648518346349538789



15 μm

mito n=1356

A HIGH NUMBER OF MITOCHONDRIA IN A CELL



Inhibitory neuron of unknown type

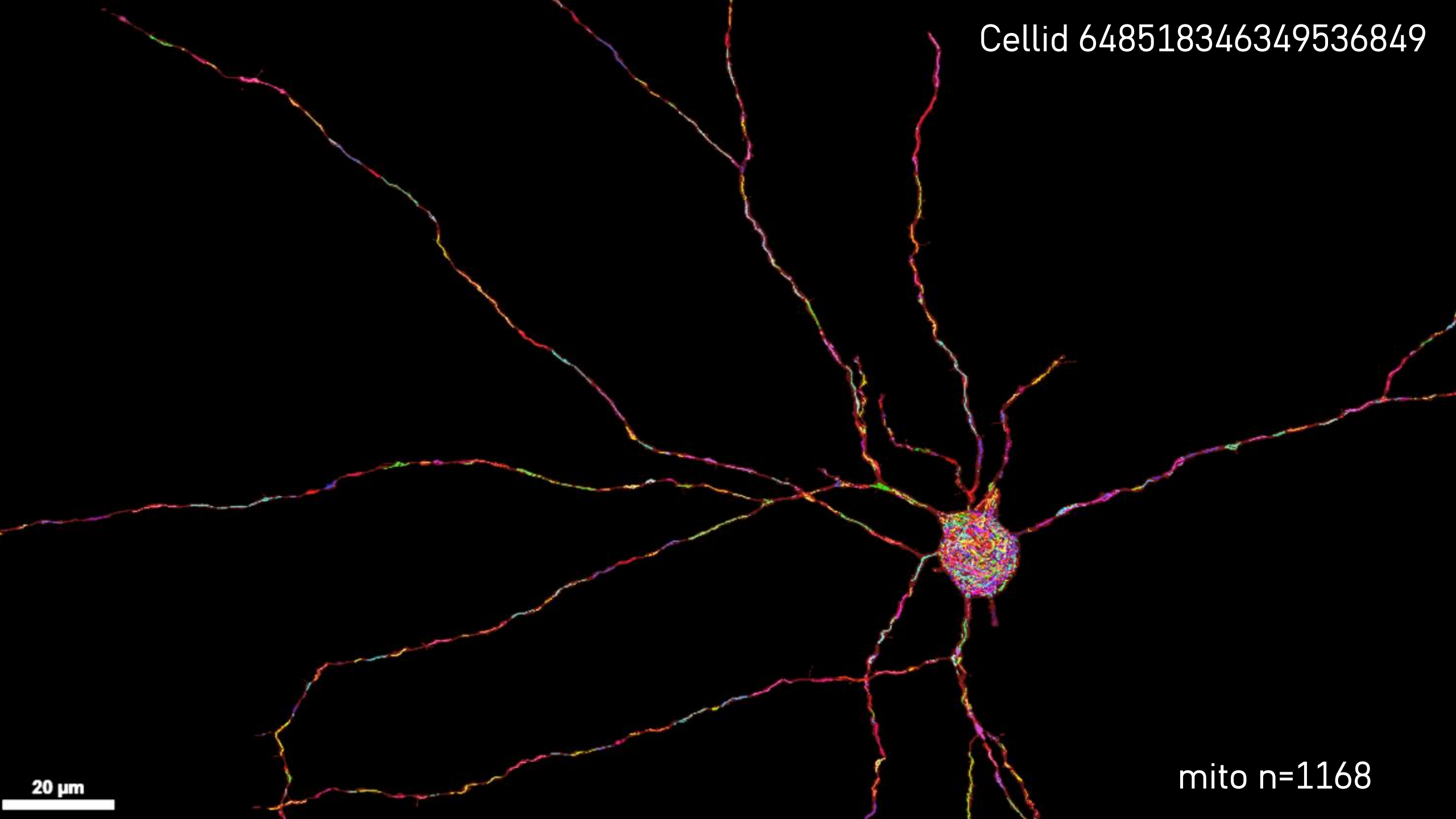


Cell id 648518346349536849



Mitochondria count $n = 1168$

Cellid 648518346349536849



20 μm

mito n=1168

A HIGH NUMBER OF MITOCHONDRIA IN A CELL



Inhibitory Chandelier neuron

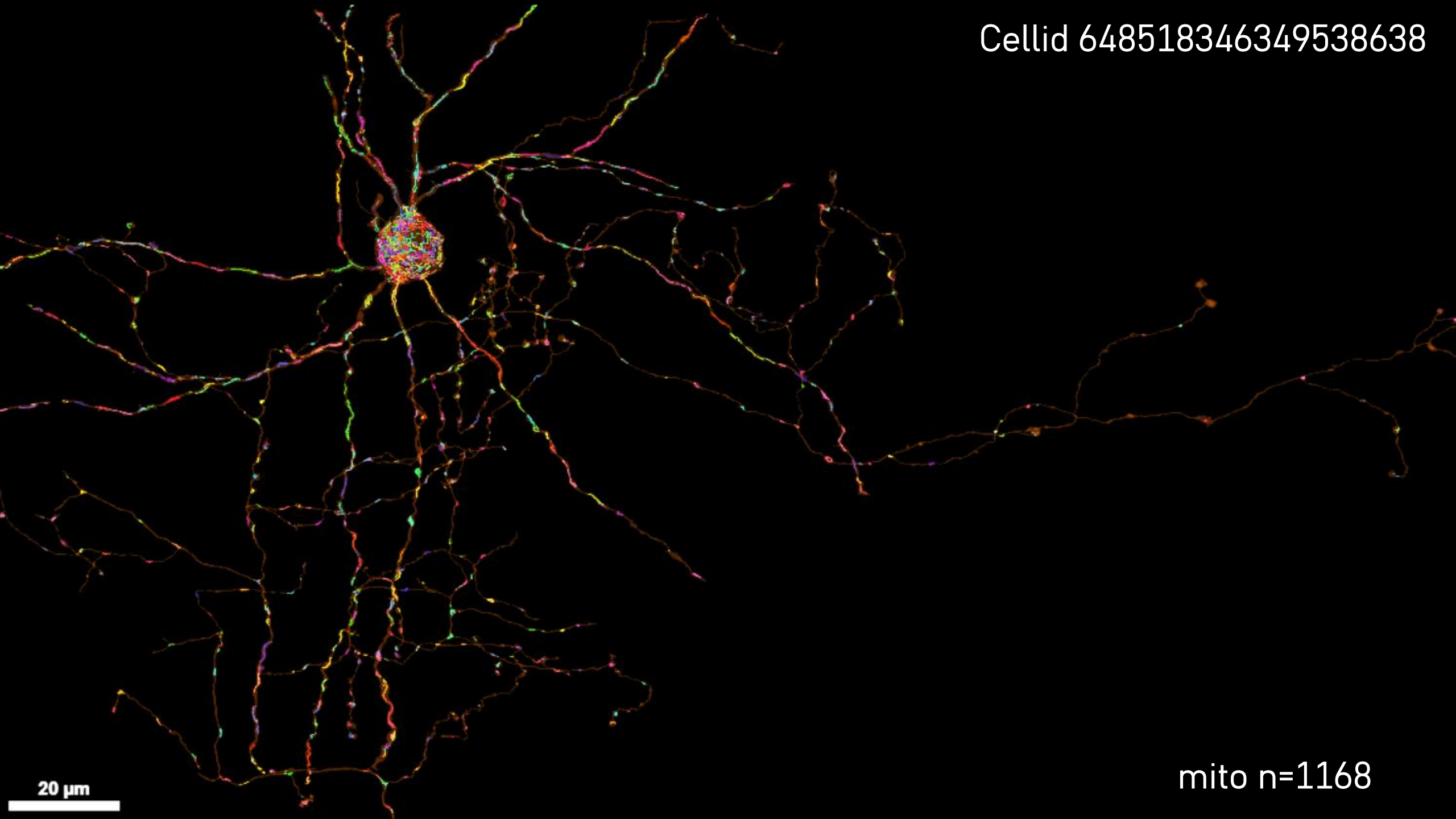


Cell id 648518346349538638



Mitochondria count $n = 1114$

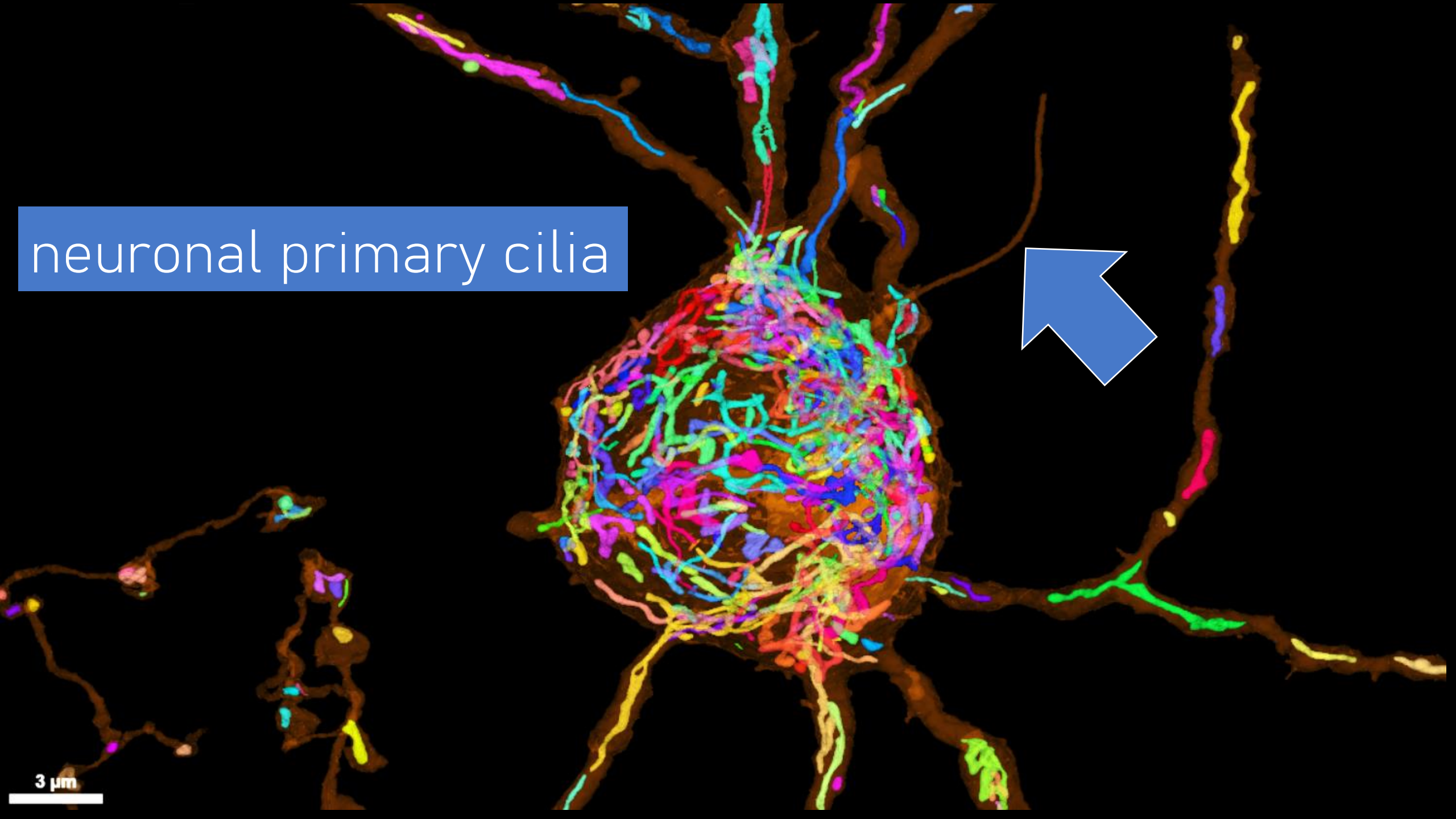
Cellid 648518346349538638

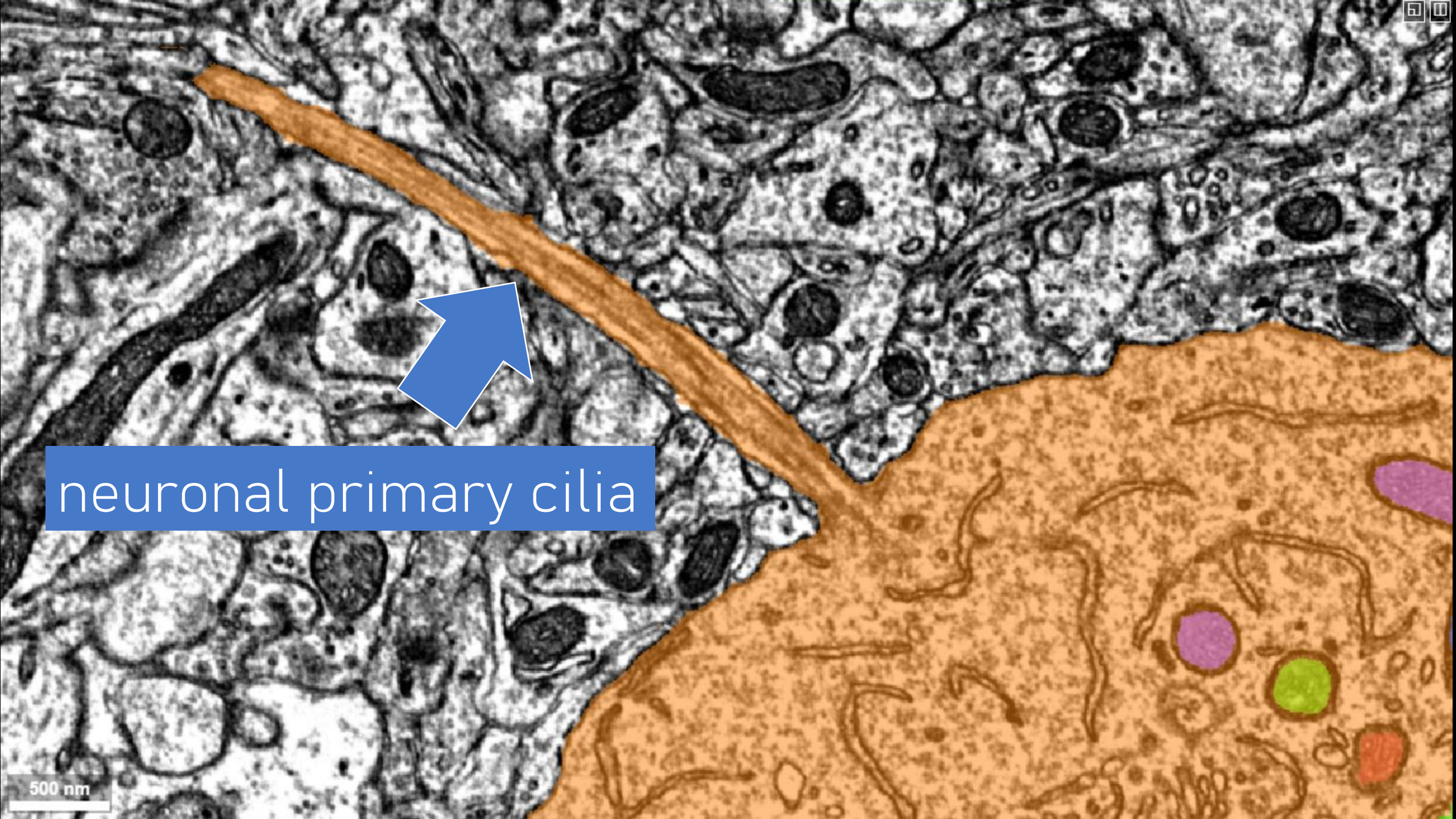


20 μm

mito n=1168

neuronal primary cilia





neuronal primary cilia

500 nm

A HIGH NUMBER OF MITOCHONDRIA IN A CELL



Inhibitory Martinotti neuron

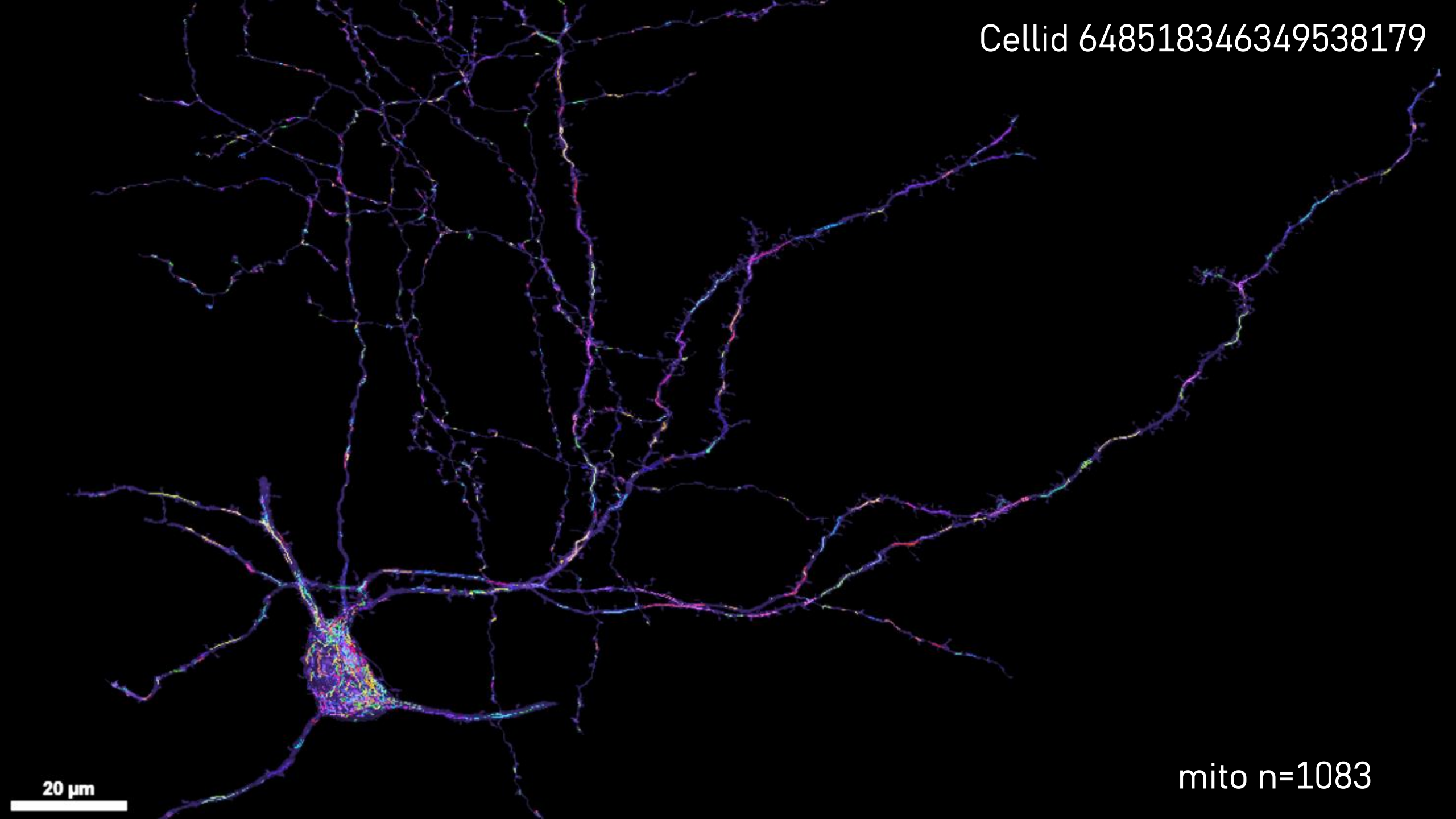


Cell id 648518346349538179



Mitochondria count $n = 1083$

Cellid 648518346349538179



20 μm

mito n=1083

A HIGH NUMBER OF MITOCHONDRIA IN A CELL



Excitatory pyramidal neuron



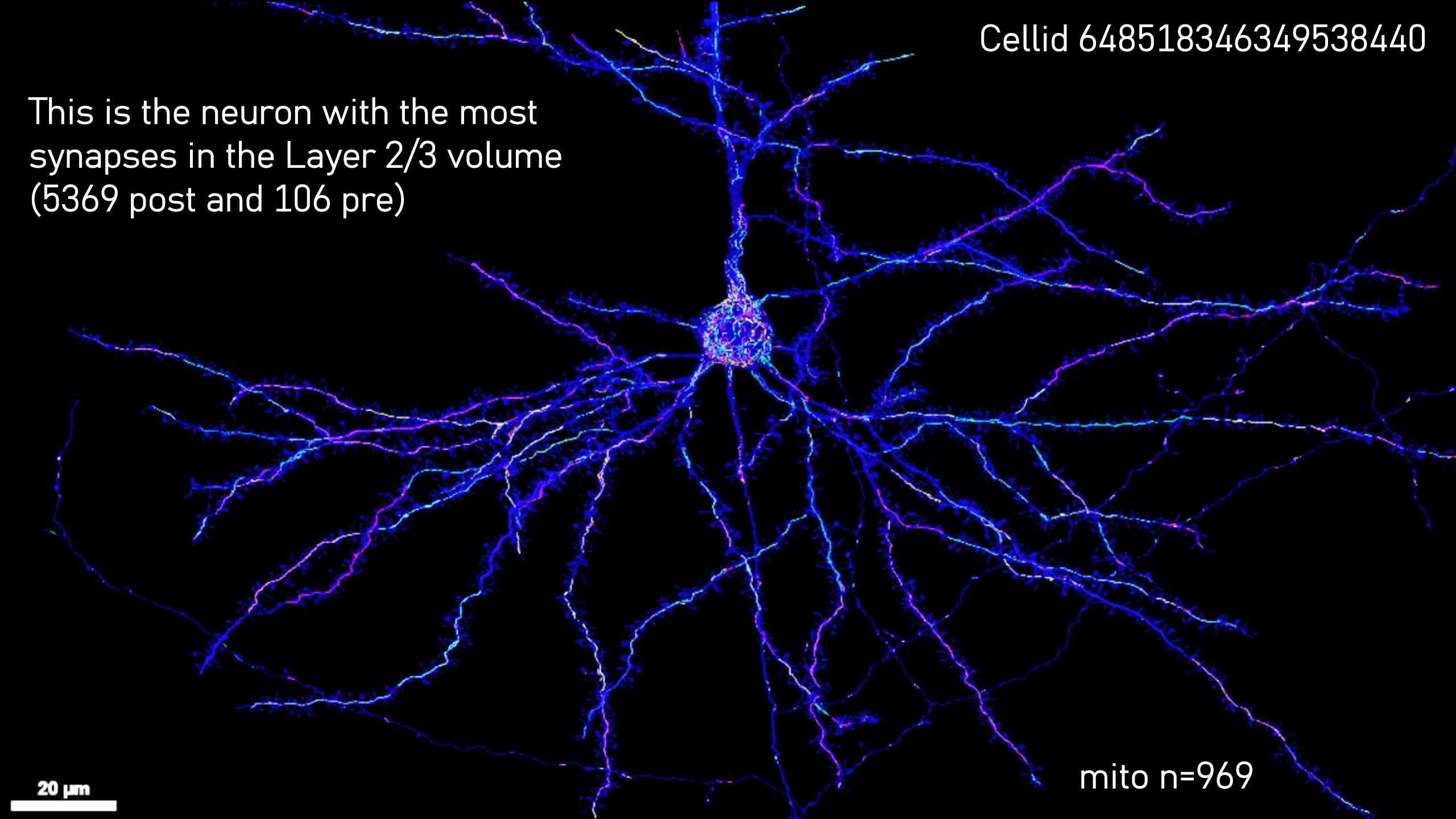
Cell id 648518346349538440



Mitochondria count $n = 969$

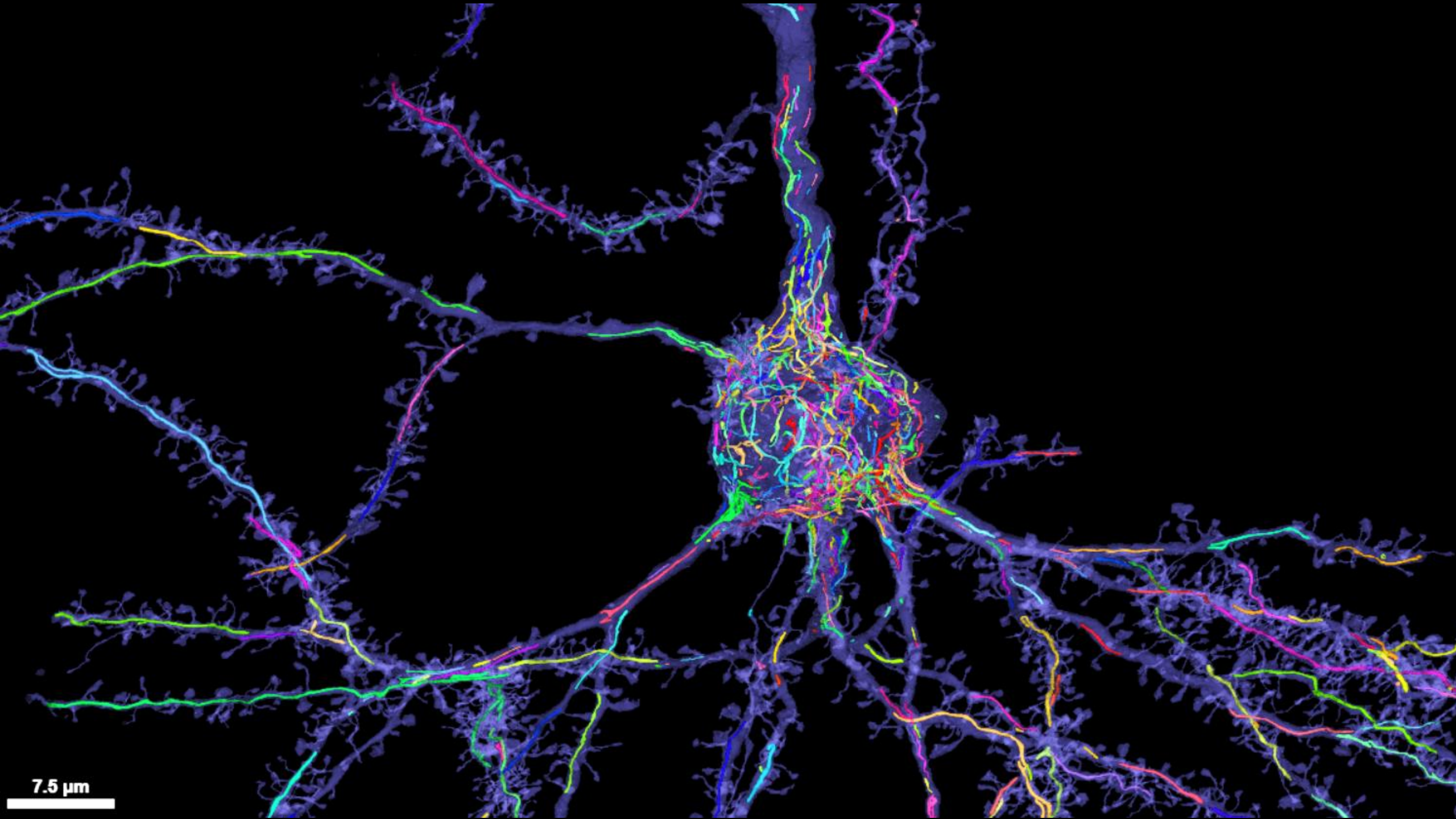
Cellid 648518346349538440

This is the neuron with the most
synapses in the Layer 2/3 volume
(5369 post and 106 pre)



20 μm

mito n=969



7.5 μm

A HIGH NUMBER OF MITOCHONDRIA IN A CELL



Excitatory pyramidal neuron

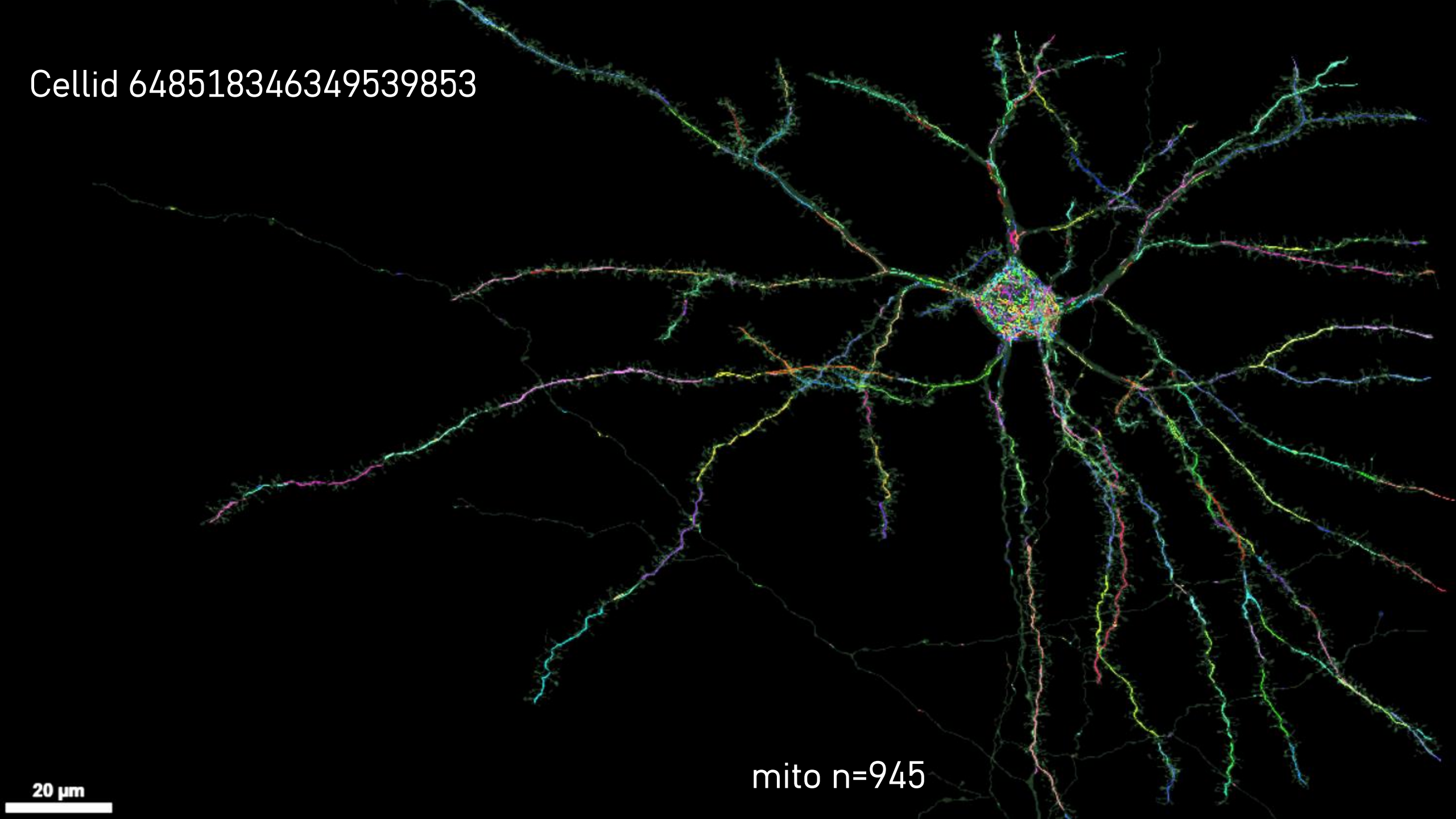


Cell id 648518346349539853



Mitochondria count $n = 945$

Cellid 648518346349539853



20 μm

mito n=945

A HIGH NUMBER OF MITOCHONDRIA IN A CELL



Excitatory pyramidal neuron

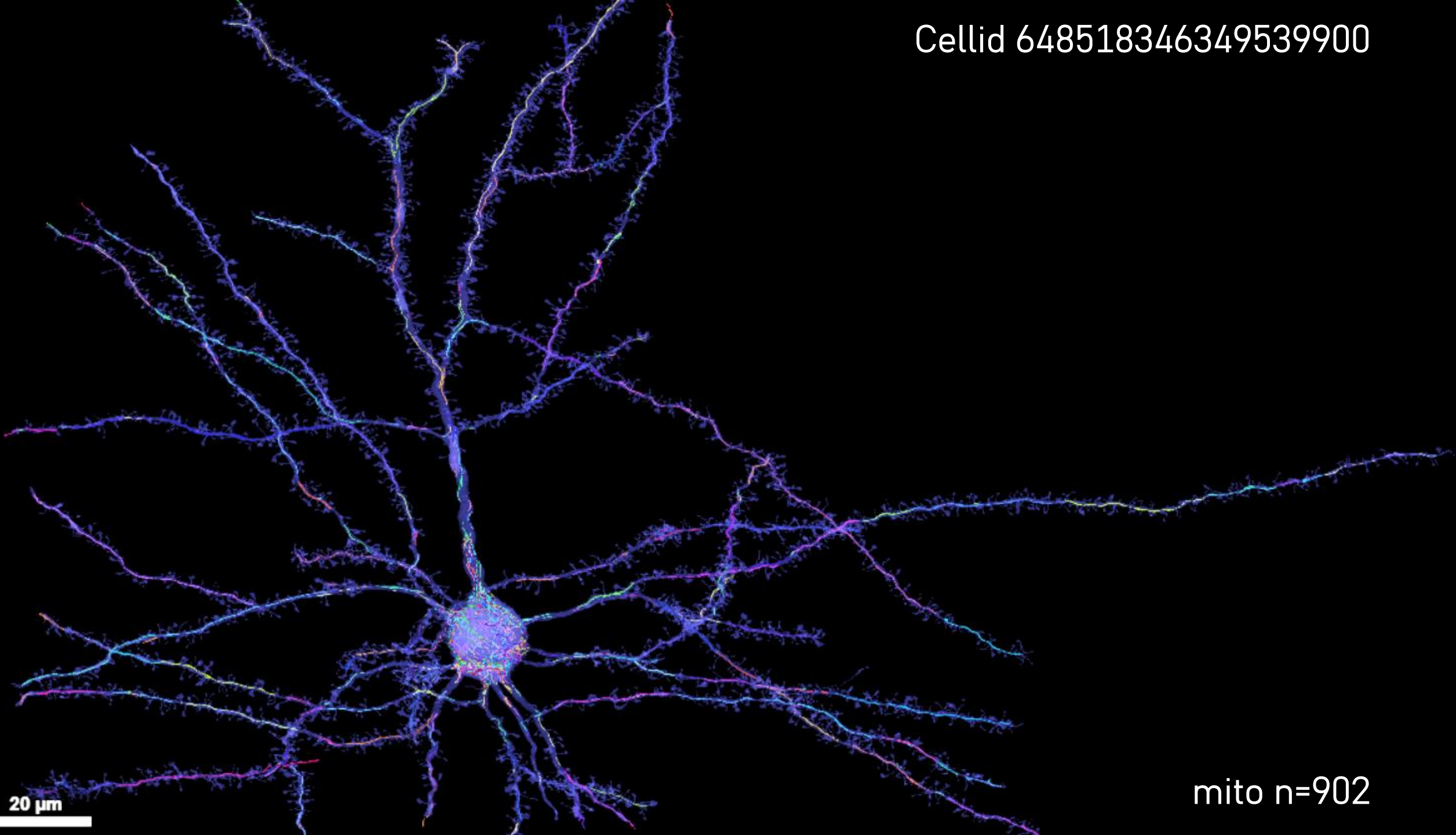


Cell id 648518346349539900



Mitochondria count $n = 902$

Cellid 648518346349539900



20 μm

mito n=902

ACKNOWLEDGEMENTS

- Read the original research papers on the [Citation](#) page at Allen Institute
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CODE AVAILABILITY

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