

Recent studies reveal novel mitochondria function in astrocytes

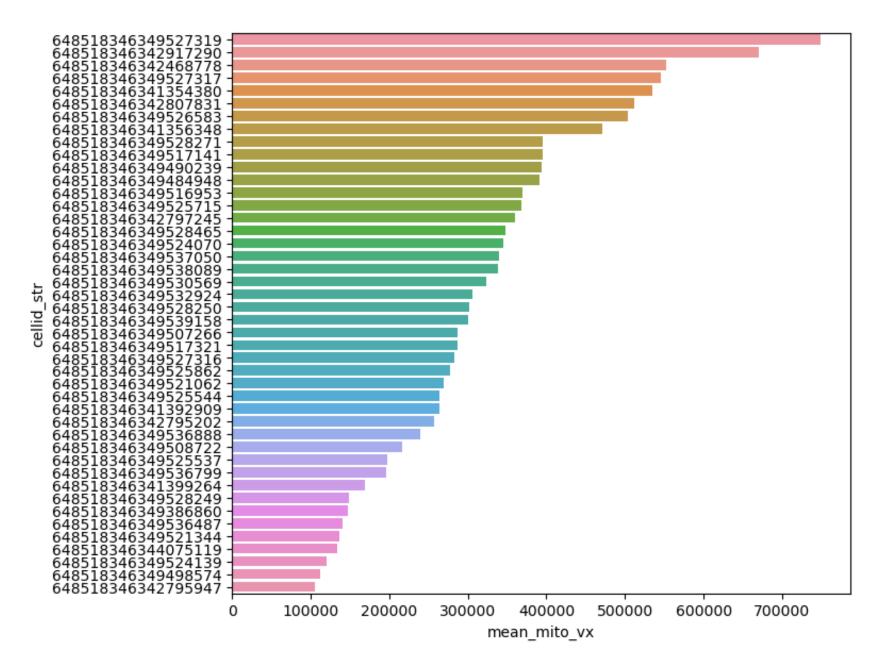
Astrocytes have extensive branchlet and leaflet processes, abundant synapse contact that increases distally from the soma, and dense mitochondria networks: Aten et al, Prog Neurobiol 2022

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



0.8 0.6 mito\_vx Strip plot of mito vx for all mitos in 0.2 an astrocyte 38089 30569 07266 7050 909 202 4634 46 9 6485 6485

cellid str

1e8

1.0

# Example: astrocyte 648518346349527319



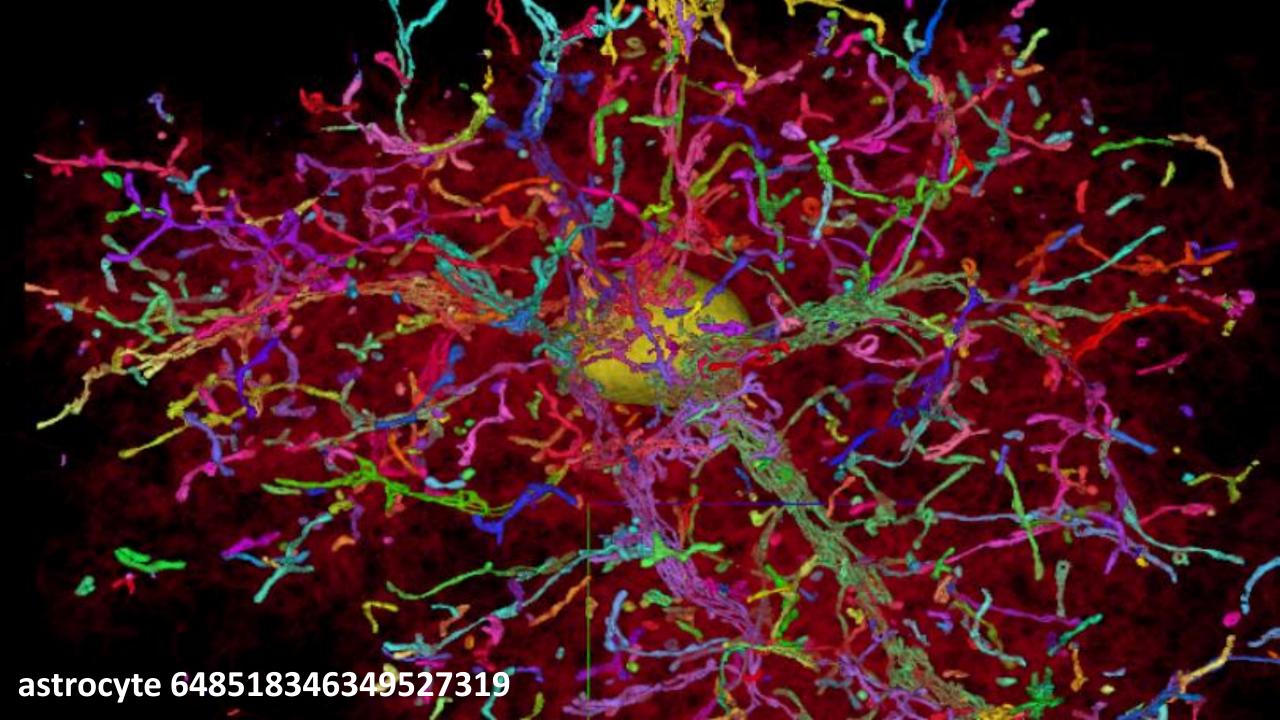
Has the largest continuous mitochondria in the entire Layer 2/3 volume

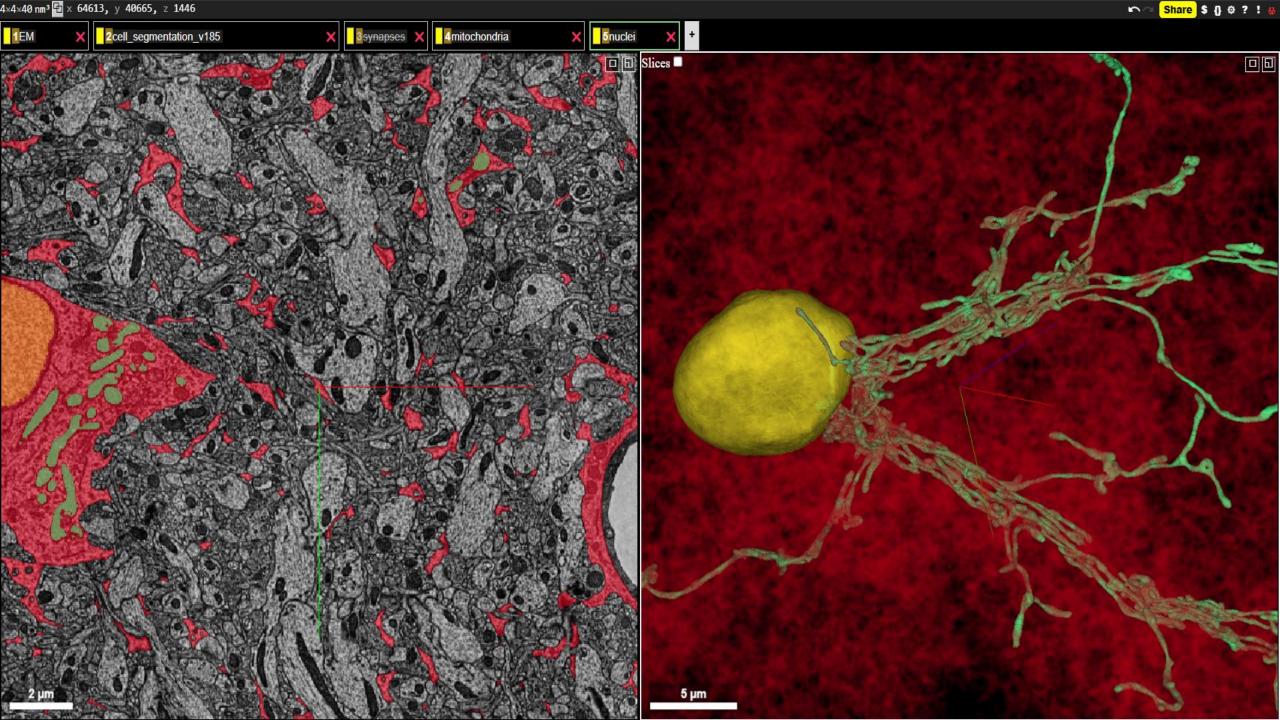


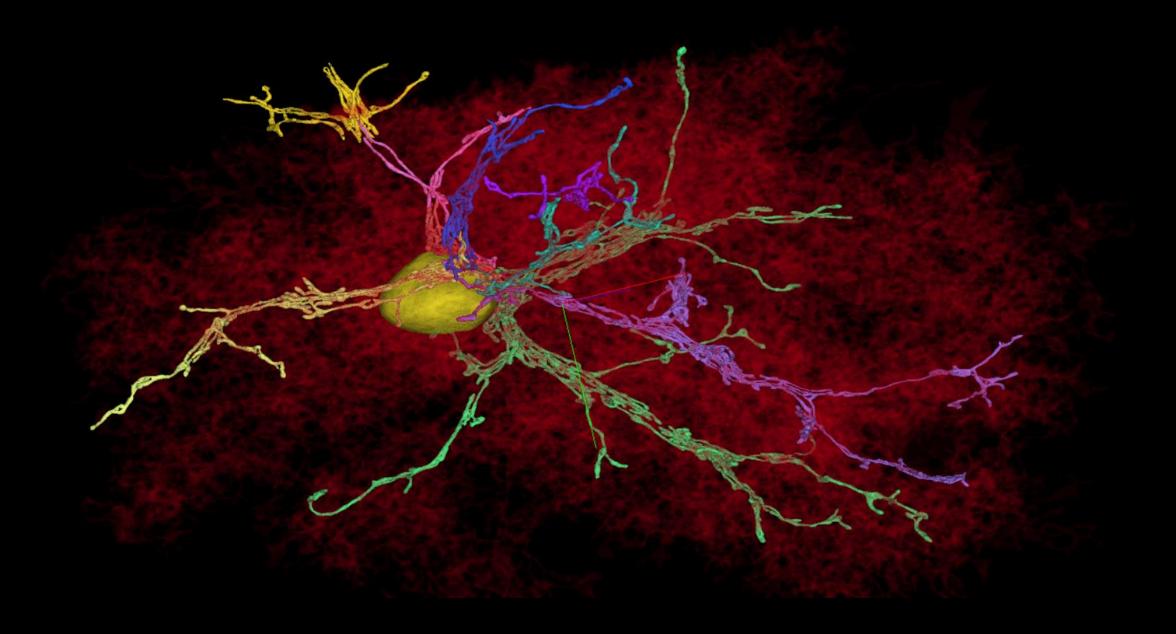
Has nine very large continuous mitochondria



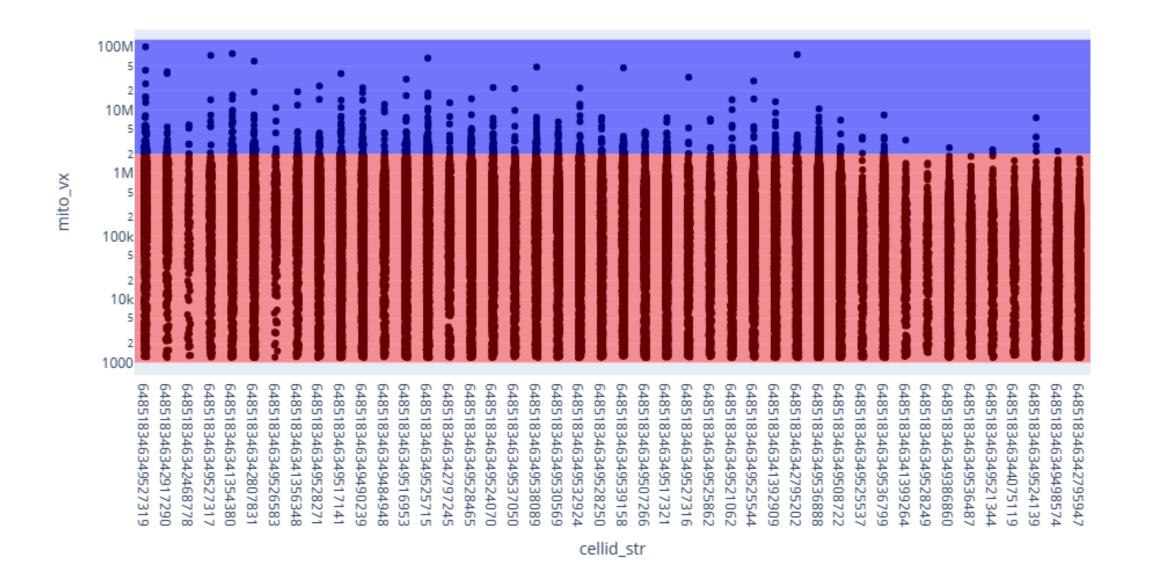
Has 31 mitochondria with voxel size above 2M



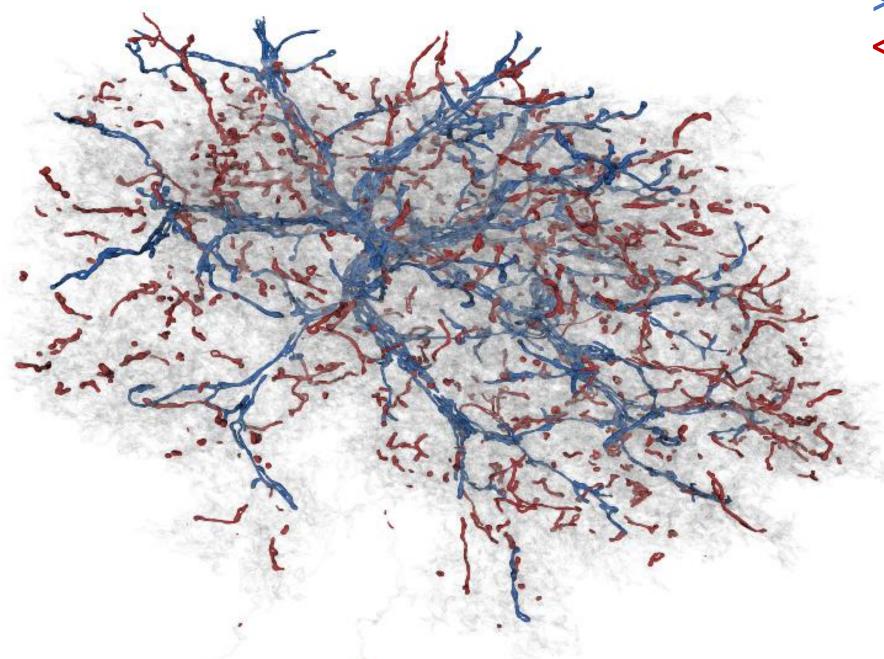




### Color mitochondria by continuous voxel size



#### >2M voxels <2M voxels



## Acknowledgements



Read the original research papers on the <u>Citation</u> page at Allen Institute



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```
mirror_object
     ror object to mirror
 peration == "MIRROR_X":
irror_mod.use_x = True
mirror_mod.use_y = False
mirror_mod.use_z = False
 _operation == "MIRROR_Y"
 Irror_mod.use_x = False
 irror_mod.use_y = True
 irror_mod.use_z = False
  operation == "MIRROR Z";
  rror_mod.use_x = False
  rror_mod.use_y = False
  rror_mod.use_z = True
  election at the end -add
   ob.select= 1
  er ob.select=1
   ntext.scene.objects.action
  "Selected" + str(modification
   irror ob.select = 0
  bpy.context.selected_obj
  ata.objects[one.name].sel
  int("please select exaction
  -- OPERATOR CLASSES ----
    X mirror to the selected
     pes.Operator):
   ject.mirror_mirror_x"
```

# Code Availability

Visit my GitHub repository to view how the images and data in this presentation were generated