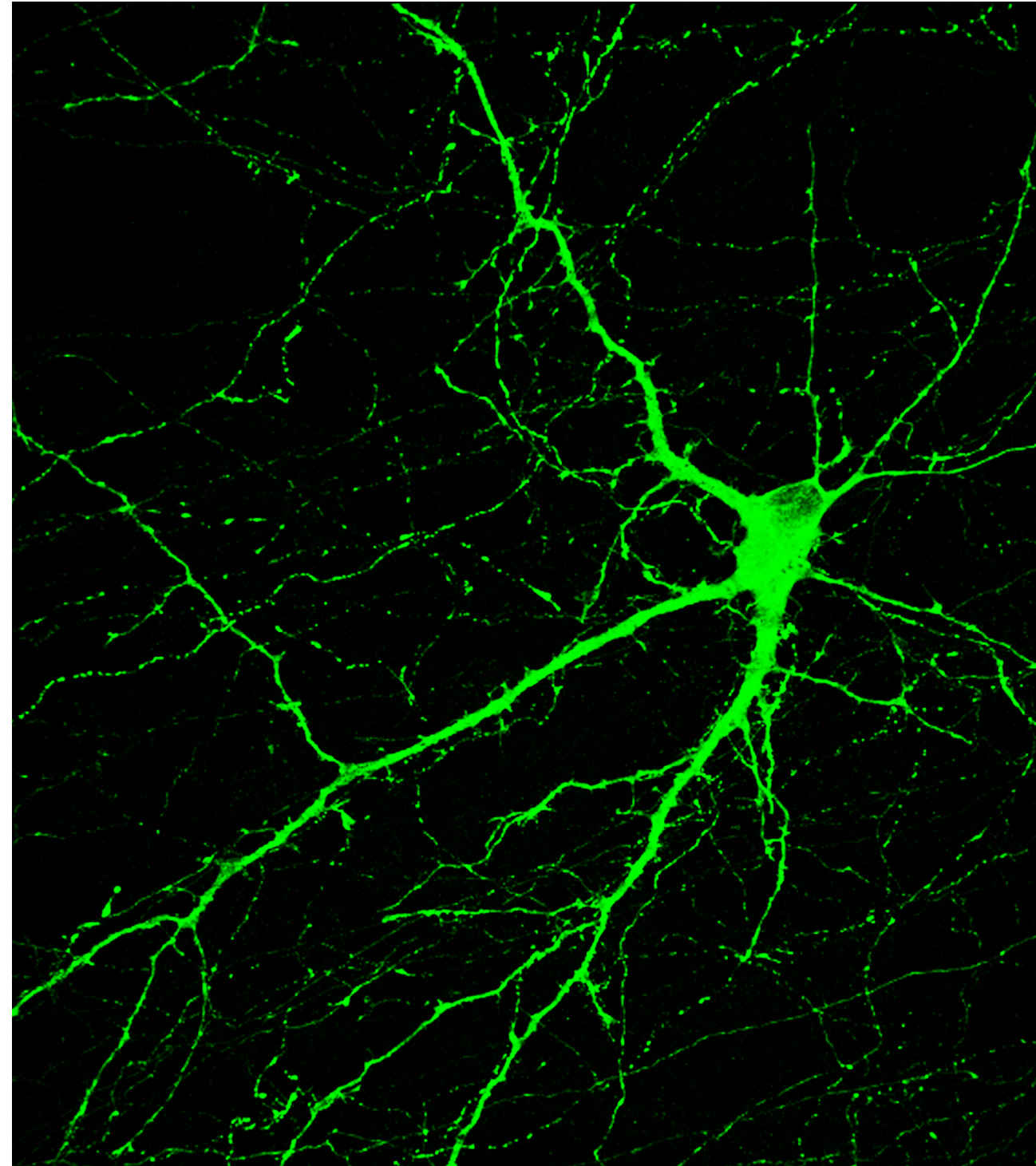


Contains Modified NASA VIIRS VP46A2 (2012) retrieved from the Level-1 and Atmosphere Archive & Distribution System (LAADS) Distributed Active Archive Center (DAAC), located in the Goddard Space Flight Center in Greenbelt, Maryland (<https://ladsweb.nascom.nasa.gov/>)



Credit: David Tenenbaum (2013), Transplanted brain cells in monkeys light up personalized therapy, Medical Xpress & Yan Liu, Su-Chun Zhang, University of Wisconsin-Madison

Cell Part	City Analogy	Purpose
Cell	City	Area with fixed boundary
Cell Membrane	City Limits	Surrounds & Border
Cytoplasm	Environment	Inner space
Nucleus	City Hall	Controls the activities
Nuclear Membrane	Police Force	Protects
Ribosomes	Farm or Factory	Makes products
Endoplasmic Reticulum	Roads or Highways	Transportation system
Golgi Bodies	Post Office or UPS	Packs & carries
Mitochondria	Power Plant or solar panels or windmills	Provides Power
Lysosomes	Recycling Plant or Waste Management	Recycle & waste disposal
Vacuole	Storage Facility – boxes, crates, and plastic bags	Stores food and waste
Chloroplast	Green grass within the city	Where photosynthesis takes place
Cell Wall	Brick wall surrounding city	Gives shape, structure, support & protection

Source: Chrystal Elliott

# Views from Inner and Outer Space

You see the similarity of the objects above on the left and right images. These objects are very different in size but they have similarity in shape and with their structure. On one side, the long dimension of one of the objects (including its branches) is about 30000 meters. On the other side the long dimension is about 0.000001 meters. Which is which?

We need a microscope to see the object on one side above and an instrument looking down from a satellite platform to see the objects on the other side. Both have a central part that contains the key ingredients which make the object what it is. Both need materials and energy to survive. They both also have branches radiating from the central parts which help with communication and material transport.

What does it mean that a city and a brain cell (also called a neuron) have these shape and function similarities? Do send us your understanding of why this is by email to [kvarkenspacecenter@univaasa.fi](mailto:kvarkenspacecenter@univaasa.fi).

