TOOLBOX

Hologram brings brain's complex highways to life

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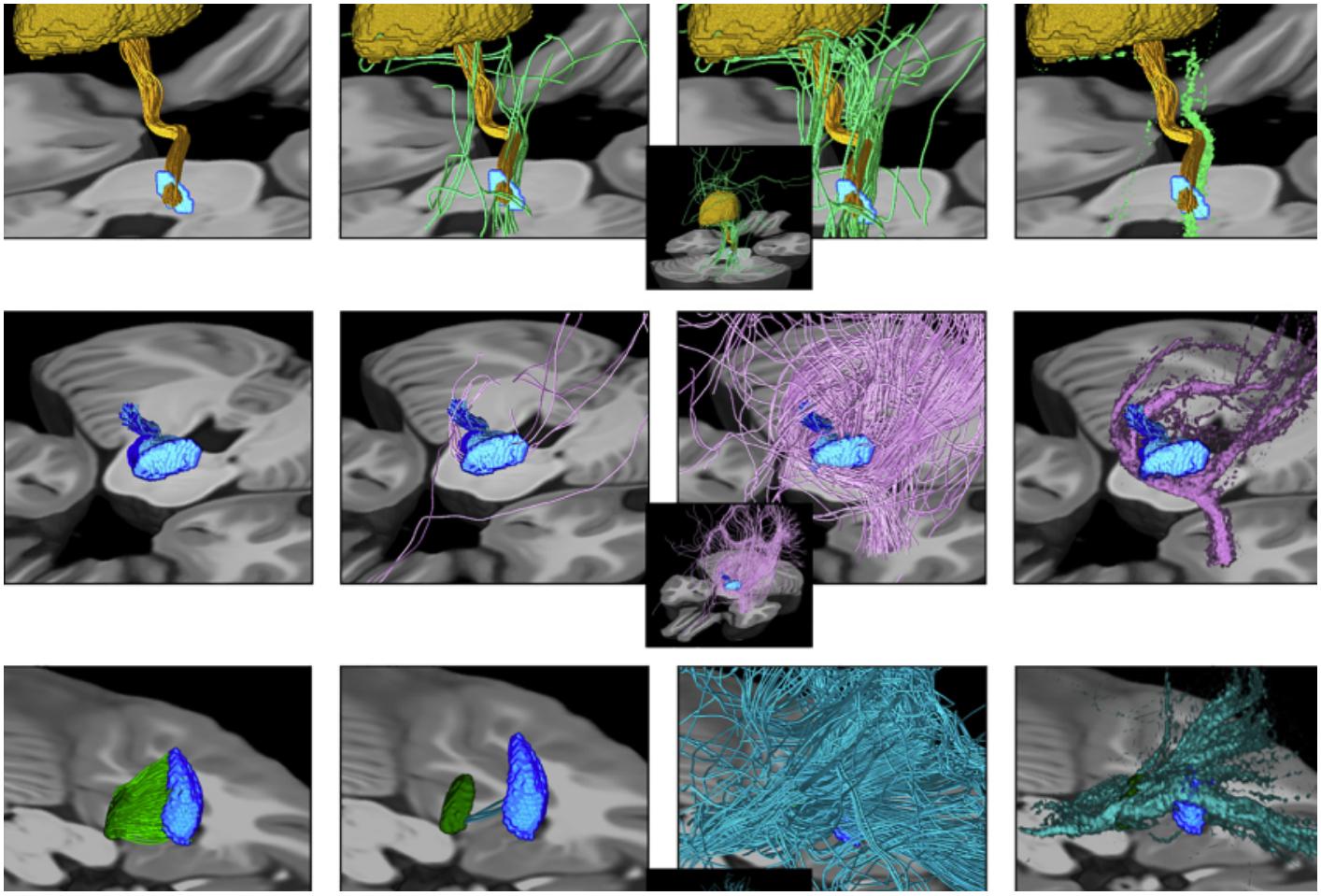

Bioengineers and neuroanatomists have collaborated to create a holographic representation of how information travels in the brain. The technology could be used to study conditions such as autism[1].

Neurons transmit information through long projections called axons. But the paths these fibers travel have been unclear.

The researchers focused on axons in a brain region called the subthalamus, a common target for deep brain stimulation therapy. Understanding how axons move in this region may help to improve deep brain stimulation's usefulness for treating Parkinson's disease, they say.

A standard technique for understanding how axons convey information, called tractography, produces 3D models of the axons' pathways. Tractography relies on magnetic resonance imaging scans to produce 3D simulations called tractograms.

Tractography is effective for visualizing large pathways, such as those found in the corpus callosum, a bundle of nerve fibers **implicated in autism**. It is less adept at depicting smaller pathways such as those in the subthalamus, which often become tangled.

These limitations led the researchers to explore holographic renderings.

REFERENCES:

1. Petersen M.V. *et al. Neuron* **104**, 1056-1064 (2019) **PubMed**