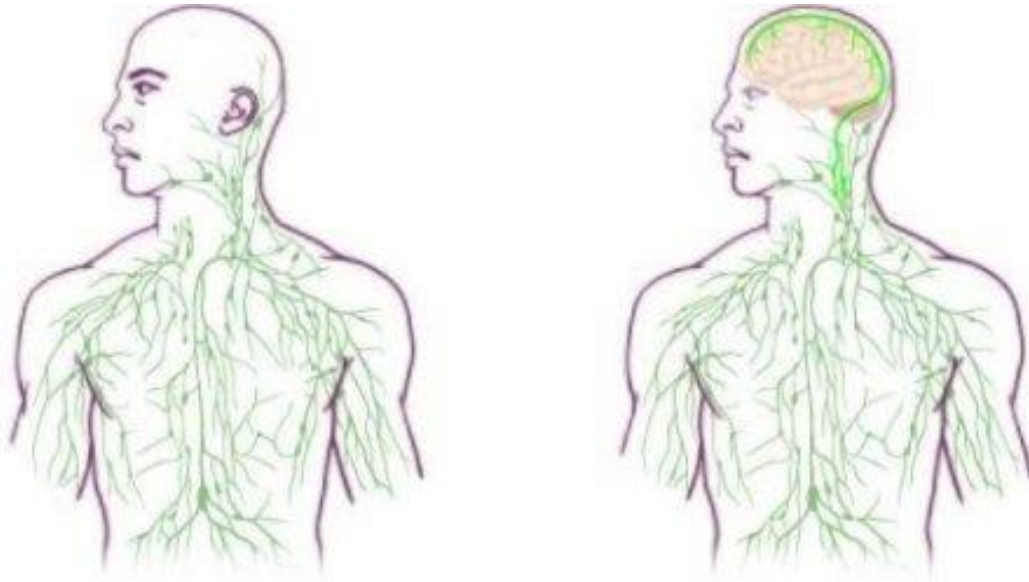


mental_floss

Scientists Discover a New Part of the Human Body

[Jordan Rosenfeld](#)



Map of the lymphatic system: traditional (left) and as redrawn by the researchers' discovery. Image courtesy of University of Virginia Health System.

When you woke up this morning, you did so with an entirely new body part—at least in the eyes of science. You can't see it or touch it, but it will play a crucial role in understanding neurological diseases and immunity.

Researchers at University of Virginia's School of Medicine recently discovered a long-hidden system of vessels they've coined the "central nervous system lymphatic vessels," which drain lymphatic fluid from the brain to the surrounding lymph nodes.

The discovery, published in [Nature](#), has shaken up the scientific community. The study was headed by Antoine Louveau, a postdoctoral fellow in the lab of UVA's Jonathan Kipnis, director of the Center for Brain Immunology and Glia. The team detected the vessels after Louveau

developed a method for mounting a mouse's meninges (membranes covering the brain) on a slide without ruining the delicate tissue. When he saw vessel-like patterns in the distribution of immune cells, he tested for lymphatic vessels—and the results surprised everyone. They were also able to find the vessels in human brain samples.

This find is the neuroimmunological version of stumbling across a unicorn. Not only had the system gone undiscovered until now, but textbooks argued against its very existence. As a result, neuroimmunologists have struggled to understand the mechanisms of brain drainage and inflammation.

When all other tissues in the body become inflamed, molecules or pathogens are drained into the local lymph cells, where immune cells get activated to continue the fight. “In the brain, we thought this system didn't exist. When we first saw those vessels, I completely freaked out,” Kipnis tells *mental_floss*. “This discovery is as exciting as it gets.”

The deep location of these newly discovered vessels is likely what has kept them secret for so long. They're found in the dural sinuses, which drain blood from the internal and external veins of the brain into the internal jugular veins. They're also near a major blood vessel, which obscured them from view.

These vessels show all the “molecular hallmarks of lymphatic endothelial cells,” the researchers write. They carry fluid and immune cells from the brain in the cerebrospinal fluid, and are connected to the deep cervical lymph nodes—where immune cells enter and exit.

Kipnis cautions that because the human brain is far more complicated than a mouse brain, these new vessels need to be studied more in depth to better understand them. Nevertheless, he's excited about the role this discovery may play in understanding and treating many disorders, including multiple sclerosis (MS), Alzheimer's, and autism: “The most important things are yet to be discovered.”

June 24, 2015 - 10:30am