Nasal spray found to clear tau proteins from Alzheimer's mouse model brains

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A multi-institutional team of neuroscientists has developed a nasal
therapy that cleared the brains of Alzheimer's mouse models of toxic tau proteins. In their study, published in the journal *Science Translational Medicine*, the group found a certain conformation-specific antibody that would bind to tau proteins, placed it inside of a shell that allowed it to travel through the blood brain barrier, and then tested it with mouse models.

Soraya Meftah, Claire Durrant, and Tara Spires-Jones, dementia specialists at the University of Edinburgh, in the U.K., have published a Focus piece in the same journal issue outlining the work done by the team on this new effort.

Prior research has shown that most people who develop one of several types of progressive neurological disorders, including Alzheimer's, develop tau structural proteins due to tau mutations and misfolds.

Scientists have therefore been looking for ways to stop the flow of such proteins into the brains of affected people or to lower the amount once it gets there. Unfortunately, such efforts have met with limited success.

In this new study, the research team developed a nasal spray with the ability to clear tau proteins from the brains of mice engineered to have human-like Alzheimer's symptoms.

The researchers looked for an antibody that would bind to tau proteins and destroy them by putting antibodies into Petri dishes with nerve tissue containing tau proteins. Once they found one that appeared to be a good possibility, they encased a batch of them in tiny lipid bubbles, small enough to pass through the blood-brain barrier. Once in the brain, the bubble covers wore away, releasing the antibodies.

For therapeutic use, the team placed the antibody bubbles into a liquid solution and delivered it to a nasal spray bottle. They then used the nasal
spray on several mouse models and observed them over time to see if it made a difference.

The research team found that the mice exhibited reduced dementia symptoms. Testing of the mice post mortem showed lowered levels of tau tangles and folds and fewer tau seeds. They also found the same results when applying their spray to human nerve tissue samples. More research is required to determine if the spray is safe for testing in human patients.


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