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PRESS RELEASE

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TESTING FOR ALZHEIMER'S BEFORE THE DISEASE SETS IN

New research led by a Danish professor suggests that a diagnostic test will be able to identify who is at risk of being hit by Alzheimer's disease in later life.

People who suffer from the incurable brain disease show signs of the disease a long time before they get sick.

New research from the University of Copenhagen and Rochester Medical Centre in New York State led by **Professor Maiken Nedergaard** indicates that mice bred to develop Alzheimer's disease have reduced function in certain parts of the brain while they are still healthy but do not show any external signs of developing the disease later.

"It is an incredibly interesting finding for us. This knowledge gives us a basis for understanding the causes of this debilitating disease and therefore perhaps the treatment of it. We also believe that it will now be possible to create a diagnostic test to find out who will develop Alzheimer's disease later in life," said Professor Nedergaard from the Centre for Basic and Translational Neuroscience at the University of Copenhagen.

Professor Nedergaard is one of the most recognised names in neuroscience. She has attracted worldwide attention for the discovery of the so-called glymphatic system in the brain, a cleaning system that starts during sleep: the brain's 'washing machine.'

In experiments with mice, she and her team of researchers have proved that a fluid flowing between the brain cells in a microscopic grid flushes the brain. The fluid brings along accumulated waste products and leads them out into the lymphatic system.

As mice become older, the cleaning process is reduced and undesirable waste molecules, in the form of proteins, accumulate. This might explain the fact that the risk of getting dementia is greater as you grow older.

The new study demonstrates that even in healthy, younger Alzheimer's mice, this cleaning process is reduced before the waste products are even accumulated.

Professor Nedergaard presented her new research at the largest neuroscience meeting in Europe, FENS Forum, held in Copenhagen, together with another equally important study she is involved in:

Further research into neurological disease is hampered by the fact that one can only examine the brains of mice and not humans. Together with a Finnish research team, she has now, for the first time, discovered a method for studying the glymphatic activity in humans without interfering with the brain.

Using an MRI scan, the Finnish researchers take thousands of images of water molecules in the patient's brain, 10 images of the entire brain every second. The images are then sorted according to when the heart beats, or according to when the patient breathes.

"This will give a great insight into the water movement in the brain. The new technique is so promising that we hope that in the future, it will be possible to determine who is at risk of getting Alzheimer's or of developing dementia. For the first time ever, it might be possible to measure the effects of practicing yoga, meditation or exercise training on the extent of cleansing of the brain," she said.

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Reference SL04 – Nedergaard: The glymphatic system

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NOTES TO EDITORS

The 10th FENS Forum of Neuroscience, the largest basic neuroscience meeting in Europe, organised by FENS and hosted by the Danish Society for Neuroscience will attract an estimated 6000 international delegates. FENS mission is to advance research and education in neuroscience within and outside Europe, to facilitate interaction and coordination between its members. FENS represents 43 national and single discipline neuroscience societies with about 24,000 member scientists from 33 European countries. <http://www.fens.org/>

Further Reading

Suppression of glymphatic fluid transport in a mouse model of Alzheimer's disease
<http://www.ncbi.nlm.nih.gov/pubmed/27234656>

Ultra-fast magnetic resonance encephalography of physiological brain activity - Glymphatic pulsation mechanisms? <http://www.ncbi.nlm.nih.gov/pubmed/26690495>