

Research in the News

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1. Researchers in Germany are in the process of developing a drug for humans that appears to improve memory and other symptoms of Alzheimer's disease in older mice. The drug, known as PRI-002, directly targets toxic beta-amyloid oligomers, the self-replicating proteins that are believed to cause Alzheimer's, without undermining the immune system. Recent testing in humans has shown that the drug is safe for use and well tolerated, so phase two of a human trial can now commence.

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2. A team of scientists in the UK have been developing a test for identifying early signs of dementia, using virtual reality (VR) technology. Participants in the testing – 45 patients with mild cognitive impairment (MCI) from several hospital memory clinics – wore a virtual reality headset whilst “walking” through a simulated environment. The researchers also took samples of cerebrospinal fluid (CSF) to look for biomarkers of Alzheimer's disease, and compared them with results of the VR test. Those with positive CSF markers performed worse than those with negative CSF markers. Secondly, the VR navigation task was better at differentiating between these low and high risk MCI patients than a battery of currently-used tests considered to be gold standard for the diagnosis of early Alzheimer's.

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3. Changing gut bacteria could potentially affect the growth and development of Alzheimer's disease, but only in males, new research shows. Researchers at The University of Chicago, tested long-term antibiotic use in mice and found that changes to the microbiome limited the development of amyloid plaques in males only, with females showing an increased inflammatory response. Inflammation in the brain is one of the factors that lead to Alzheimer's.

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4. A team of researchers at Massachusetts Institute of Technology revealed in 2016 that light therapy was helpful in reducing toxic protein build up in the brains of mice. Further study showed that combining light and sound therapy was even more effective, and longer-lasting, in reducing tau and amyloid accumulation. Now, the researchers have identified the cellular mechanisms that work to achieve this result. By boosting gamma oscillations (brain waves that help facilitate memory and attention) connections between nerve cells can be increased, and a reduction in inflammation and neurodegeneration is observed.

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5. Scientists claim they have discovered a way to track the progress of Alzheimer's disease via a specific protein in blood. Research, conducted in Sweden, suggests that levels of the protein, *neurofilament light*, are higher in people with diseases, such as Alzheimer's, and by testing for the protein, they can track the progress of the disease, and ascertain whether drug treatments are working. The blood test is cheaper than PET scans and MRIs, and less invasive than testing cerebrospinal fluid.

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6. Far from being just a reproductive organ, a new study suggests that the uterus may also affect brain functions such as spatial working memory. The research, conducted by a team at Arizona State University, showed that rats who had undergone hysterectomies (as opposed to having uterus *and* ovaries removed, just ovaries, or neither removed) performed significantly worse than rats in the other test groups, when navigating a water maze. Hormone levels were also affected in the first group of mice, suggesting that removal of the uterus changes the body's hormone profile which, in turn, affects the brain.

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7. A study project, said to be the largest of its kind in the world, is hoping to determine genetic and blood markers for neurodegenerative disease. The Island Study Linking Ageing and Neurodegenerative Disease (ISLAND) project, run by the Wicking Dementia Research Centre, is seeking 10,000 Tasmanians to take part in a range of activities, surveys and testing. Researchers will look at who is most at risk of developing dementia and how they can potentially "self-manage" dementia-risk behaviours. Tasmania is an ideal environment for the study; its population is the oldest in Australia and is continuing to age at a faster rate than the national average. Tasmanians are also statistically more likely to volunteer for health research.

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