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1. Research, led by Queen Mary University in London has discovered a gene that can slow down the development of Alzheimer's disease in people with Down's syndrome, a group at high risk of developing the disease. The researchers looked at why some people with Down's syndrome have delayed development (up to 20 years) – or never develop – Alzheimer's dementia, despite having three copies of the amyloid precursor protein (APP). It was found that these people have an extra dose of all other genes located in chromosome 21, which possibly counteract the damaging effects of the third APP gene.

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2. Researchers in the U.S have identified a new class of proteins capable of protecting synapses - the structures neurons use to communicate - from being destroyed. As synapse loss is a known contributing factor towards Alzheimer's disease and schizophrenia, the findings may lead to new treatments for these diseases. Once in adulthood, synapse numbers stabilize, being formed and destroyed at roughly the same rate. However, in some neurological diseases, the brain overproduces complement proteins, which signal immune cells called macrophages to essentially eat synapses. The scientists discovered the newly-identified proteins act as 'don't eat me' signals that protect synapses from being destroyed. Further research is required to determine how these inhibiting proteins could be harnessed and manipulated to reduce synapse damage, and what clinical effects (if any) this might produce.

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3. Covid-19 can lead to long-term complications beyond the respiratory system, according to researchers in the UK. Neurological issues such as stroke, encephalopathy and a rare condition of brain inflammation are increasingly seen in patients contracting the virus. Doctors are warned to be vigilant about addressing memory concerns, fatigue and numbness. In a study by researchers at the Dementia Research Centre at University College London, acute disseminated encephalomyelitis (ADEM) was found in almost 25% of patients, quadrupling the usual amount of cases normally seen in a month.

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4. Researchers from Macquarie, working with mice with advanced dementia, have succeeded in reversing the memory loss associated with Alzheimer's disease. The treatment works by focusing on a naturally protective enzyme in the brain called p38gamma which, when activated, prevents the toxic effects of memory loss. The researchers utilised gene therapy to reconstitute lost enzymatic memory activity and make it more efficient, not only halting memory loss, but reversing the loss already present.

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5. Researchers in the U.S. believe regular flu vaccines may reduce the risk of developing Alzheimer's in later age, by as much as 30%. A study of over 9,000 people aged 60 years and above showed that regular vaccines, especially if started at an earlier age (i.e. 60 or younger), were associated with a much lower risk of the disease, especially if combined with an additional vaccination against pneumonia. This research contradicts earlier thinking, that the vaccines (a form of inflammation) would increase the risks of developing Alzheimer's and worsen any associated symptoms.

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