

A New Blood Test to Detect Alzheimer's Disease (Feb 2021, California, U.S.)

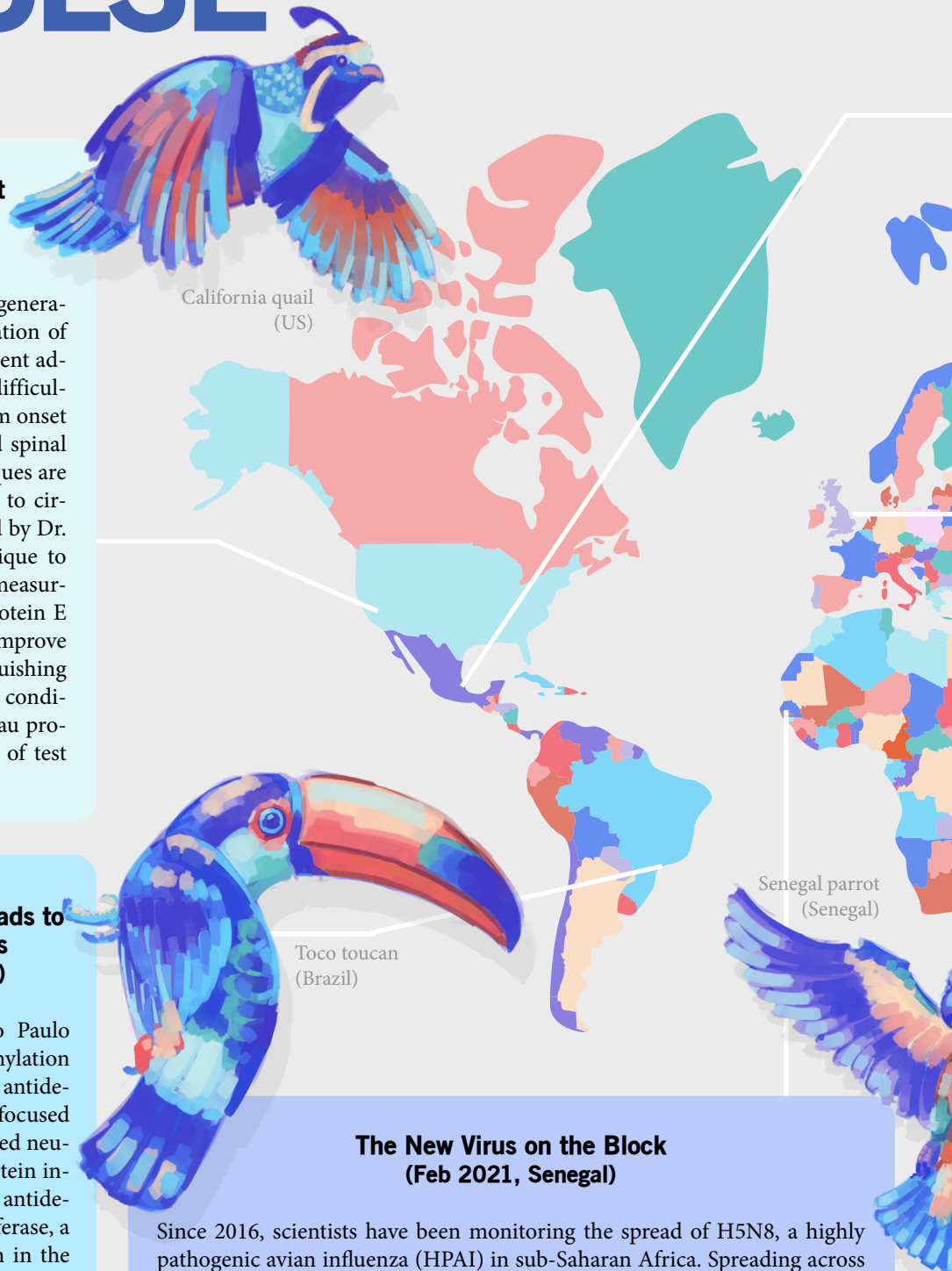
Alzheimer's disease (AD) is a neurodegenerative disorder marked by the accumulation of beta-amyloid plaques in the brain. Recent advances have attempted to mitigate the difficulties of diagnosing AD prior to symptom onset using tools such as brain imaging and spinal fluid sampling. However, these techniques are invasive and expensive. In an attempt to circumvent this issue, a research team led by Dr. Adam Boxer developed a new technique to assess the risk of developing AD. By measuring blood concentrations of apolipoprotein E and beta-amyloid, this test is able to improve the accuracy of diagnosis by distinguishing AD from memory loss caused by other conditions.¹ Future developments may use tau proteins to further improve the accuracy of test results.²

DNA Methylation Regulation Leads to Antidepressant-Like Effects (Feb 2021, Sao Paulo, Brazil)

A study from the University of São Paulo showed that the inhibition of DNA methylation in the prefrontal cortex could exert an antidepressant-like effect. The experiment focused on the interaction between brain-derived neurotrophic factor (BDNF), a natural protein involved in neural plasticity that exhibits antidepressive effects, and DNA methyltransferase, a protein that reduces BDNF expression in the brain and increases in activity during stressful situations. Researchers used Wistar rats injected with two pharmacologically different DNA methyltransferase inhibitors and measured the neural protein transcript levels in the hippocampus and prefrontal cortex during a learned helplessness test.³ The study found that the inhibition of stress-induced DNA methylation in the prefrontal cortex exerted an antidepressant effect, a finding that may lead to the development of novel therapeutic antidepressants.⁴

The New Virus on the Block (Feb 2021, Senegal)

Since 2016, scientists have been monitoring the spread of H5N8, a highly pathogenic avian influenza (HPAI) in sub-Saharan Africa. Spreading across western Eurasia, the Middle East, and Nepal, the H5N8 influenza dispersed widely as waterbirds migrated from region to region.⁵ A pandemic was limited to Asian countries between 2016 and 2018, but it has since spread globally and continued to infect African populations in 2020. Recently, a new strain of HPAI has resurfaced in Africa— H5N1. January 2014 marked the first incidence of HPAI H5N1 in Canada, and October 2020 marked the first incidence in Senegal.^{6,7} While it has limited spread in humans, HPAI H5N1 spreads rapidly among avian species. In Senegal, more than 700 dead pelicans were found positive for H5N1.⁸ While vaccines are stockpiled in response for a potential pandemic outbreak, H5N1 continues to show sporadic activity and may present another pandemic in the future.⁶



Toxic Ingredients Found in Select Hand Sanitizers (January 2021, Mexico & US)

With >900 accidental poisonings involving hand sanitizer within January 2021, the United States Food and Drug Administration (FDA) has placed a countrywide “import alert” on all alcohol-based hand sanitizer imports from Mexico.¹¹ Imported products contained traces of methanol, a toxic substance that is absorbable through the skin and poisonous when ingested. Repeated exposure may result in nausea, vomiting, and permanent damage to the nervous system. Roughly 84% of analyzed samples did not comply with the FDA regulations for safety, and over 50% contained harmful levels of methanol or 1-propanol. The FDA encourages public reports of any harmful effects from hand sanitizer products.¹²

The Kidney Disease Mobile App (Feb 2021, UK)

New AI diagnostic tools are transporting the laboratory setting away from the clinic and into patients’ homes. Healthy.io, a new biotechnology company based in the UK, has developed an at-home testing kit that can be used for early diagnosis of kidney disease.⁹ Using an absorbent pad and a phone camera, the AI mobile application uses a colorimetric analysis to provide readings equivalent to what laboratory analyses reveal. At-home screening for proteinuria has not only proven to be efficacious, but also preferred by patients; a survey found that 89% of patients (n = 999) preferred at-home tests over clinical visits.¹⁰ With 3500 patients having already received a testing kit, it is projected that over 500 000 patients will benefit from this technology over the next three years.⁹

Research Establishes Antibiotic Potential for Cannabis (January 2021, Australia)

Researchers at the University of Queensland have established an antibiotic application for synthetic cannabidiol (CBD). The study states that CBD disrupts bacterial activity through its ability to both penetrate and inhibit the production of bacterial biofilm, which are clusters of bacterial growths that attach to surfaces and other bacteria to evade immune detection and resist antibacterial treatments.¹³ As a result, CBD bypasses the biofilm’s natural defence system. This synthetic compound selectively produces antibacterial effects for numerous resistant strains of bacteria, including *Streptococcus pneumoniae* and *Neisseria gonorrhoeae*, and further tests have shown a low tendency for resistance towards CBD. With prominent antibacterial properties, researchers are exploring possible clinical applications of this cannabinoid.¹⁴

Changing the Face of Healthcare (Jan 2021, Singapore & India)

The COVID-19 pandemic has led many countries into technical recessions, prompting governments to reallocate their financial resources. India’s economic growth prospects remain uncertain due to lengthy lockdown protocols, but new strategies are being proposed that would allocate 2.2 trillion rupees (~\$30 billion USD) to develop the country’s capacity to provide primary, secondary, and tertiary care. From these funds, 350 billion rupees will be used for COVID-19 vaccines, with the remaining being allocated to public infrastructure.¹⁵ In prioritizing healthcare facilities, these new plans may catalyze the Indian biotechnology sector, which was forecasted to grow to \$100 billion USD by 2025.¹⁶ Only time will tell if India will become a lead innovator in the emerging healthcare treatment market.