RESEARCH HIGHLIGHTS

IN BRIEF

COVID-19 database launched in the USA
The US National Institutes of Health has created the COVID-19 Neuro Databank/Biobank (NeuroCOVID), a database to enable recording and tracking of neurological involvement in COVID-19. Health-care providers in the USA can submit anonymized information online about neurological symptoms, comorbidities, disease course, complications, sequelae and outcomes of patients with COVID-19. Biospecimens collected for research or clinical management can also be provided to the biobank.

ALZHEIMER DISEASE
Markers of vulnerable neurons identified in Alzheimer disease
The transcription factor RORB is a marker of several populations of neuron that are lost early in the course of Alzheimer disease (AD), according to new research published in *Nature Neuroscience*. The gene expression profiles of these cell populations could provide insights into the mechanisms of selective neuronal vulnerability in AD.

The tendency for some neurons to die early in the course of AD and for others to survive longer has been well characterized at the gross anatomical and network levels; however, less is known about selective vulnerability at the level of individual cells. The new study was led by Lea Grinberg and Martin Kampmann, who aimed to identify molecular signatures of vulnerable cell populations in AD.

The researchers analysed postmortem samples of the entorhinal cortex (EC) and superior frontal gyrus (SFG) from ten male individuals with varying degrees of tau pathology, as determined by Braak staging. They performed single-nucleus RNA sequencing (snRNAseq) on each sample and used clustering analysis to identify cell-type populations.

“Using a single-cell approach was essential, because we were looking for the ‘needle in the haystack’ — the specific neuronal subpopulations that are most vulnerable to disease,” explains Kampmann.

Compared with Braak stage 0, the relative abundance of excitatory neurons was reduced at Braak stages 2 and 6 in the EC, and at Braak stage 6 in the SFG. Although these changes were not statistically significant, they were consistent with previous data.

“For many decades, we have known that excitatory neurons located in layer II of the entorhinal cortex are the first cortical neurons to accumulate tau pathology,” explains Grinberg. “However, even neurons within layer II show different levels of vulnerability.”

Parkinson Disease
RNA biomarkers of Parkinson disease
Regulatory circular RNAs (circRNAs) could be diagnostic biomarkers of Parkinson disease (PD), a new study has shown. Expression of 87 circRNAs in blood mononuclear cells from 60 patients with idiopathic PD was analysed, and 6 were found to be downregulated in patients with PD compared with healthy controls. Several of the proteins that these circRNAs bind to, and therefore regulate, are associated with neurodegeneration, including fused in sarcoma (FUS) and TAR DNA-binding protein 43 (TDP43), so their dysregulation could also offer insight into the molecular pathways affected in PD.

Huntington Disease
Neurodevelopment affected by HD mutation
Retrospective analysis of brains from people with Huntington disease (HD) has shown that developmental malformations are more common among people with HD than among controls without HD. People with HD were 6.4–8.2-fold more likely to have malformations than controls; the most common malformations were periventricular nodular heterotopias. Malformations were associated with heterozygous CAG expansions of 40–52 repeats in the HTT gene and were more common among women. The findings provide evidence that the repeat expansion in HTT causes HD also affects neurodevelopment.

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