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Brain gain: Europe's big advances in neuroscience

EU researchers are coming up with new ways to tackle the range of illnesses tied to the human body's most complex organ.

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In the southern French city of Marseille, health researchers have developed a way to operate more effectively on epilepsy patients. In Milan in northern Italy, scientists have come up with better methods to treat people who have lost consciousness. In the Dutch capital Amsterdam, experts have devised a technology to restore a degree of sight in the blind.

These and other medical advances across the continent all have one thing in common: they result from an unprecedented EU-funded research project to expand understanding of the human brain – the body's most complex organ – and help doctors tackle impairments in it.

The Human Brain Project (HBP), which ran for a decade through September 2023, brought together 155 organisations from 19 countries.

It was driven by the wide-ranging impact of brain disorders, which afflict an estimated 165 million Europeans, are responsible for illnesses ranging from Alzheimer's disease and stroke to depression and addiction and cost healthcare budgets in Europe approximately €1 trillion a year.

With its own budget of more than €600 million, HBP used cutting-edge technologies – from high-performance computing to neurorobotics – to produce a "Human Brain Atlas". Composed of 3D maps, the atlas reveals brain structure, function and connectivity with more scope and precision than ever before.

'Think of the atlas like Google Maps but for the brain – to zoom in and to zoom out to see all the details and then apply it for all research questions,' said Professor Katrin Amunts, a German neuroscientist at the University of Düsseldorf who led HBP. 'It represents brain organisation on all different levels from the cells

to large systems.’

HBP also achieved breakthroughs in personalised brain medicine – advancing an EU goal of more customised healthcare – and established a cutting-edge open research infrastructure called EBRAINS, which gathers data, tools and computing facilities to facilitate further advances.

Below is a Horizon Magazine video interview with Amunts about HBP and EBRAINS, which she co-leads.

Watch the video

More info

- Human Brain Project
- EBRAINS
- EU brain research