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Deep mysteries of the human brain to be uncovered by new study

Scientists are set to map the human brain in unprecedented detail, potentially revealing new insights into the foundations of behaviour and brain disease.

Researchers hope to map the trillions of connections between brain cells – known as synapses – that allow chemical and electrical messages to flow and are vital for healthy brain function.

The elaborate map will show how these vital connections are organised throughout the brain and in its different regions.

If successful, the project will deepen the fundamental understanding of brain structure and function and shed light on different brain diseases and behavioural conditions.

Researchers, based at the University of Edinburgh's Centre for Clinical Brain Sciences, have been awarded a grant of £1.3 million by the Wellcome Trust for the work.

The new project builds upon their previous work creating another such map – called a synaptome – for the mouse brain.

They used cutting-edge techniques, such as molecular imaging and artificial intelligence, to look at synapses across the whole of the mouse brain.

The study showed that mice bred to mirror aspects of autism and schizophrenia had different synaptome maps and did not recall information properly.

The map suggested that the diversity of synapse types may be key to storing and recalling information, helping the brain to quickly locate memories through patterns of activity. Experts hope to explore this further in the next phase.

Lead researcher, Professor Seth Grant, said: “Unravelling the immense complexity of the human brain is one of the great scientific challenges. We will chart the molecular architecture of the human brain and our maps will help explain the basis of our thoughts and actions in healthy people and those with brain disorders.”

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