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Journey down memory lane

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The cover embroidery for the August issue of *The Lancet Neurology* has been adapted from a drawing of a hippocampal slice by Santiago Ramón y Cajal, made 110 years ago.¹ The organisation of neurites in the slice provided him with clues to the direction of signal propagation through the hippocampus, indicated by the arrows. This highly intuitive organisation is not only aesthetically appealing, as seen through the microscope, but also of great value in synaptic circuit research.

The capacity of the brain to learn and recover from injury is largely attributed to neuroplasticity—the process of strengthening or weakening connections in response to stimuli. The hippocampus, with its defined synaptic circuits, has been widely used to study plasticity for decades, and during that time scientific techniques have advanced rapidly. Silver staining and careful observation down the microscope—used by Cajal for his original drawing in 1911—have segued into super-resolution microscopy. Increased resolution has led to breakthroughs such as the discovery of mitochondrial respiration within the dendritic compartment of neurons, which is required for synaptic plasticity and, therefore, memory formation.²

In the field of stroke, preclinical models of subarachnoid haemorrhage implicate exposure to haemoglobin in cell death and altered brain function. These findings highlight a potential role for the haemoglobin scavenger haptoglobin in preventing these deficits.³ One of us (HKW, the cover artist) is a neuroscience PhD student and uses hippocampal cells to uncover the single-cell effects of haemoglobin on plasticity and brain function. Years of experience investigating the mouse hippocampus, and adoration for its structure, made it the perfect subject for this needlework.

References

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