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► **COVER:** 'Building blocks' by Kirsten Lee, inspired by the Review on p87.



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For decades neuroscientists have worked to understand the molecular and neural underpinnings of learning and memory. Since 1953, when patient H. M. lost his ability to form new memories following an experimental operation designed to relieve his severe epilepsy, his involvement in hundreds of studies has greatly contributed to our understanding of the brain correlates of learning and memory. He has been one of the most important participants in memory research, and will remain so even following his death in December 2008, as he has donated his brain for detailed analysis.

Cellular and molecular studies have added to the information gained from patients such as H. M. In this issue, Lee and Silva (page 126) discuss the molecular signalling pathways that lead to enhanced performance in learning and memory tasks in various transgenic mice, and highlight the key role of NMDA receptors and CREB-mediated transcription in cognitive function. By manipulating these signalling pathways it might be possible to enhance the acquisition or retention of information and to develop treatments to relieve the symptoms of several cognitive disorders.

Synaptic plasticity is crucial for learning and memory. Many proteins in the postsynaptic density contain PDZ domains, and on page 87 Feng and Zhang review studies which show that the tandem arrangement of these domains in scaffold proteins confers distinct target-binding properties. These enable the proteins to actively participate in the dynamic regulation of signalling events at the synapse and thereby contribute to synaptic plasticity.

These articles show that molecular and behavioural studies have greatly contributed to our understanding of the mechanisms that underlie learning and memory.

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Printed in Wales by Cambrian Printers

on acid-free paper