Lay Summary

BRAIN UK Ref: 11/004

Response of stem cells in the human brain to acute/hypoxic injury

Dr N Cohen, University of Bristol

Injury to the central nervous system through stroke and head injury is common and associated with variable degrees of functional recovery amongst survivors. Tissue damage is mediated by both ischaemia (a reduction in blood flow to the brain) and hypoxia (a reduction in oxygen to the brain) resulting in cell death with an area of the brain called the hippocampus being particularly susceptible to damage. However, the biology underlying recovery is poorly understood in humans although information from models developed in mice seem to indicate that a type of cell (neuronal precursor cells, NPCs) present within the hippocampus act as a potential source of new nerve cells during tissue repair.

The applicant has undertaken a previous investigation into hippocampal-mediated brain repair using a combination of morphological study and special staining methods that demonstrate NPCs. However, some of these methods were not specific for NPCs and staining reliability was variable. The cases used for this initial investigation (post mortem hippocampus from individuals who died from cardiorespiratory arrest with corresponding controls) are to be re-examined and an additional staining method is to be employed to further characterize NPCs and to quantify the brain's ability to undergo repair after ischaemic and hypoxic-mediated damage.