

P071 Cellular and Sub-cellular Calcium Accumulation During Glutamate Induced Injury in Cerebellar Granule Neurons
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We have investigated the role of Ca^{2+} accumulation and neuronal injury in cerebellar granule neurons following glutamate receptor over activation. Following the removal of the free cytosolic Ca^{2+} we have identified an extensive second Ca^{2+} fraction (SCF) that is retained within the neurons following glutamate receptor overactivation. The existence of this SCF is sensitive to both NMDA receptor antagonists and mitochondrial inhibitors, but is unaffected by agents that deplete endoplasmic reticulum Ca^{2+} , indicating that this Ca^{2+} fraction may be located within the mitochondria. Through the isolation of mitochondria from cerebellar granule neurons treated with glutamate we show that the majority of the SCF is mitochondrial in location. On the removal of the glutamate stimulus the SCF recovers at a slower rate to the free Ca^{2+} concentration within the neuron. Most significantly we show that a short pre-application of sub-threshold glutamate or kainate blocks both SCF Ca^{2+} accumulation and extensive neuronal injury in response to high concentrations of glutamate. These findings may be relevant to the observations of preconditioning, observed in the brain and heart.