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# Intracellular localisation of mTHPC and effect of photodynamic therapy in cells of the mammalian peripheral nervous system

Fewer nerve-related side effects have been noted after treating head and neck cancer with photodynamic therapy (PDT) compared to conventional cancer therapy. Our aim is to investigate the biological basis for any such nerve-sparing effect. In this study the intracellular localisation and effect on cell viability of the photosensitiser meta-tetrahydroxylphenylchlorin (mTHPC) was investigated in cell culture models using peripheral nerve cells.

Primary cells from adult rat dorsal root ganglia (containing both neurons and glia) were used in these experiments. Localisation of mTHPC was detected using fluorescence and confocal microscopy. Levels of mTHPC fluorescence were quantified using digital image analysis. Immunocytochemistry with anti-β-III-tubulin and anti-S100 was used to distinguish neuronal and glial cell populations respectively. A cell-death assay using propidium iodide was used to evaluate neural cell susceptibility to PDT following incubation with mTHPC.

The results showed that mTHPC was localised in cytoplasmic regions of neurons and glia, but was not detected in neuronal axons. Necrotic cell death was detected after PDT in these neural cell types.

These results suggest that the cells of the peripheral nervous system are susceptible to PDT-mediated necrosis, but that the sparing of nerves observed during clinical PDT may be related to the heterogeneous distribution of mTHPC within neurons.