The role of inflammatory cytokines in the initiation of neuropathic pain after peripheral nerve repair

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**Project:**
Peripheral nerve injuries are common; it is estimated that there are 300,000 peripheral nerve injuries per year in Europe (1/1000 population). These injuries result in loss of sensory and/or motor function, and some patients develop chronic neuropathic pain, for which there is no satisfactory treatment. Injury to a peripheral nerve often results in the formation of a neuroma; a disordered mass of axons embedded within the connective and scar tissue of a damaged nerve trunk. Studies have shown that damaged axons within neuromas develop spontaneous abnormal discharge and there is compelling evidence to suggest that this activity plays a crucial role in the initiation of neuropathic pain.

Cytokines are a large and diverse family of cell signalling proteins produced by the immune system in response to tissue and nerve damage. Within the last decade, a range of studies have demonstrated an important role for cytokines in responses to nerve injury, and some have been shown to be potent mediators of pain. A clear understanding of the relationship between abnormal neural discharge and the factors that could influence its development, are of great importance if new therapeutic methods are to be developed. This study will investigate the role of a series of cytokines in the development of neuropathic pain following peripheral nerve injury and repair.

The outcome will clarify the peripheral and central mechanisms underlying injury-induced neuropathic pain, and help identify potential therapeutic approaches. The direct clinical applicability of this nerve repair model will allow beneficial effects identified to be translated into clinical use easily, and the opportunity to link the level of peripheral neural discharge to expression of peripheral and central inflammatory markers is entirely novel.

**Enquiries:**
Interested candidates should in the first instance contact Dr Simon Atkins by email (s.atkins@sheffield.ac.uk).

**How to apply:**
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**Closing date:** 2 December 2011