



## NEURO RESOURCE GROUP

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### **Poster Presentation**

### **CHANGES IN LYMPHOCYTE METABOLISM, GENE EXPRESSION AND CYTOKINE PRODUCTION FOLLOWING TRANSDERMAL INTERACTIVE NEUROSTIMULATION (INTERX®): INDICATORS OF CONNECTIVE TISSUE HEALING AND ANTI-INFLAMMATORY ACTIVITY**

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Non-invasive interactive neurostimulation (InterX ®) methodologies for treating post-operative pain and facilitating recovery after injury have been anecdotally known to be effective and more recently proven efficacious in clinical trials. InterX is FDA cleared for the treatment of acute and chronic pain, however a recent clinical trial showed reductions in inflammation in the treated group compared to control. While the pain relief mechanisms are widely accepted, the mechanism(s) by which a reduction of inflammation occurs is not well documented. In this study it is hypothesized that changes in lymphocyte metabolism, gene expression and cytokine production following InterX® treatment may illustrate mechanisms of action related to the body's inflammatory response.

A multidisciplinary approach was used to examine the effect of transdermal interactive neurostimulation with the InterX 5002 device on lymphocyte metabolic function, gene expression and cytokine production. Blood was drawn from 4 healthy adult volunteers (2M/2F) before and 20 minutes following a treatment session. Treatments consisted of 10 minutes of treatment using 480 pulse/second stimulation on the lateral elbow of the arm from which blood was drawn and 10 minutes with a 90-360 variable pulse/second stimulation over the corresponding spine root.

Results: Transdermal treatment of 4 "normal" test subjects (2 male, 2 female) with the InterX device resulted in the significant upregulation or downregulation of a number of genes and cytokines pertinent to the inflammatory process. Further, the data indicate a shift of the circulating lymphocyte metabolism from a resting state to a "ready" state, whereby they are metabolically active and poised to respond to an injury/infection. This is distinct from overt activation in that basal activities were unchanged, whereas responses were significantly augmented. This may be beneficial with respect to healing; cells that are primed for activity are more efficient, likely more responsive to chemokine signals from the site of injury, and would reach the site of injury faster than those that were not activated. This study clearly demonstrates that InterX neurostimulation does affect physiological responses relating to inflammation in humans and these responses may explain the reduced inflammation demonstrated previously.