Cleaved Link N usage for intervertebral disc repair

**Overview**
The intellectual property relates to a cleaved form (amino acids 1-8) of the Link N peptide that enables the regeneration of intervertebral disc (IVD). The potential of Link N as a therapeutic agent to promote extracellular matrix regeneration in human IVDs appears to be a viable option for treatment of the disc. Human disc cells cultured in alginate were exposed to Link N in the presence or absence of IL-1, and the effect on proteoglycan synthesis was evaluated. In addition, message levels of aggrecan, MMP-3, MMP-13, ADAMTS-4 and ADAMTS-5 were evaluated in alginate cultures. Human disc cells responded in a dose dependent manner with maximal proteoglycan synthesis at 1µg/ml Link N. Link N treatment also induced proteoglycan synthesis in intact human discs, and a prolonged effect was found up to one week after Link N treatment. Message levels of proteinases were decreased by Link N in the presence of IL-1 leading to the conclusion that Link N can promote proteoglycan synthesis and deplete proteinase expression in adult human discs.

**Applications**
The short form of Link N will be used as a therapeutic agent to repair intervertebral disc degeneration. It can also be used to prevent or delay disc degeneration in young adult at risk or diagnosed with early disc degeneration. Moreover, this treatment has great potential in veterinary applications.

**Advantages**
- Biodegradable naturally occurring peptide with less chance of side effects
- No surgical intervention required, percutaneous/intradiscal injection treatment
- Prevention and early stage treatment of the degenerative disc disease
- Cost effective compared to recombinant proteins (BMP’s)
- Minimized side effects compared to any other existent therapy, surgical or nonsurgical
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Profile

Dr. Fackson Mwale
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Dr. John Antoniou
Professor, Division of Orthopaedic Surgery, Department of Surgery, McGill University and Orthopaedic Surgeon at the Jewish General Hospital

Research focus

Innovative tissue engineering research on the mechanisms for degeneration and repair of the intervertebral disc.

- Promote nucleus pulposus repair using growth factors, scaffolds and property mesenchymal stem cells in the degenerated intervertebral disc.
- Identification of biochemical and biomechanical changes through non-invasive diagnostic techniques.
- Non-invasive diagnostic tools, quantitative magnetic resonance imaging (MRI), in the detection and quantification of matrix and biomechanical changes in early IVD degeneration.
- Stem cell repair of damaged discs using cells harvested from bone marrow of live adult donors.
- Study the influence of surface chemistry and geometry on the nutrition, growth and differentiation of disc cell.
- Intervertebral disc signaling path of the back pain.

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