



Treatment for Discogenic Pain

An injectable or implantable hydrogel for treating discogenic pain

Objective

Seeking Licensing Opportunities

Research and IP Status

Patent application submitted

Patents

International application No. PCT/EP2017/075041

US Patent No. 16/339,527

European patent application No. 17791583.2



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Background

Low back pain (LBP) is a common health problem that affects 60-80% of the population of developed countries at some stage in their lives. Patients develop chronic back pain followed by long-term disability leading to morbidity, with severe socio-economic impacts on society. The majority of cases of LBP are caused by intervertebral disc (IVD) degeneration and most patients remain asymptomatic with some experiencing discogenic pain. Current therapy for IVD degeneration focuses on spinal fusion devices such as the Infuse® Bone Graft/LT-Cage® Lumbar Tapered Fusion Device (Medtronic), AccuLIF® Expandable Lumbar Interbody Fusion Technology (Stryker), Anterior Lumbar Interbody Fusion (ALIF) (DePuy), XLIF® (NuVasive), Mobi-C® cervical disc replacement device (Zimmer Biomet Holdings/LDR), CALIBER® (Globus Medical, Inc.), ALPHATEC SOLUS® (Alphatec Holdings), SKYHAWK® Lateral Interbody Fusion System (Orthofix International) which aim to alleviate pain through the removal of a damaged or diseased disc through an anterior or lateral approach. These procedures involve the complete removal of the intervertebral disc and the implantation of an interbody fusion device to restore intervertebral height and fuse the affected vertebral bodies. Spinal fusion devices involve extensive bone work, which leads to more back pain and longer recovery times.

Critically these technologies are not regenerative in nature resulting in the need for repeated surgery and do not address the underlying disease pathology.

Tech Overview

The present technology consists of a high molecular weight hyaluronan (HA) hydrogel implant which is capable of arresting, and even reversing, progressive disc degeneration in a needle puncture pre-clinical model. The high molecular weight HA hydrogel modulates the proteome signature of cells in both the nucleus pulposus (NP) and annulus fibrosus (AF) in the same model of IVD degeneration to promote disc regeneration by the formation of functional extracellular matrix (ECM). The hydrogel implant can also inhibit pain sensitization in peripheral regions of the disc and suppress pain processes in a rat tail model of IVD by attenuation of hyperalgesia, nociception, hyperinnervation and/or hypoalgesia.

Implantation of hyaluronic acid hydrogel prevents the pain phenotype in a rat model of intervertebral disc injury. Mohd Isa IL, Abbah SA, Kilcoyne M, Sakai D, Dockery P, Finn DP, Pandit A. Sci Adv. 2018 Apr 4;4(4):eaaq0597. doi: 10.1126/sciadv.aaq0597. eCollection 2018 Apr.

[Figure 1](#)

[Figure 2](#)

Applications & Benefits

- Treatment of discogenic pain
- Addresses underlying causes of discogenic pain
- Straightforward formulation Injectable or implantable Significant pre-clinical data
- Patent protected

Core Researcher:

Professor Abhay Pandit

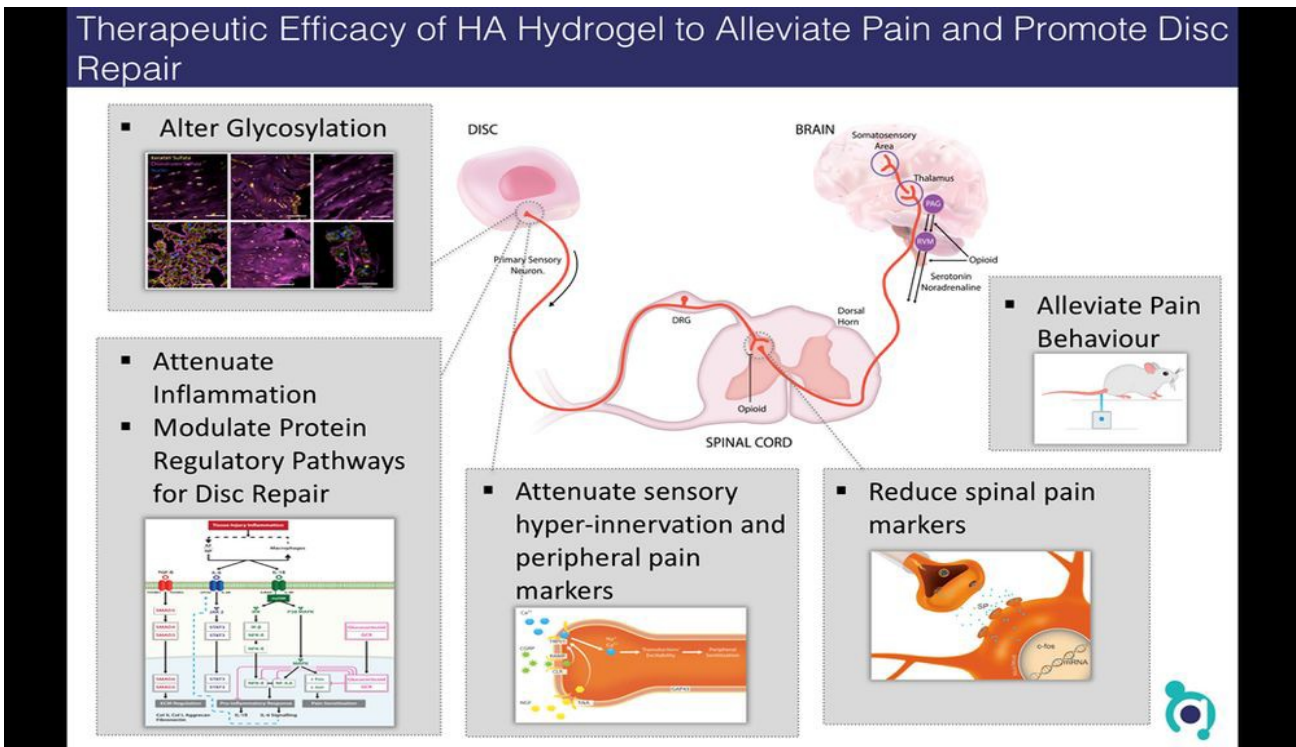
For more info. contact:

Fionnuala Brown
Case Manager,
Innovation Office, NUI Galway
Fionnuala.Brown@nuigalway.ie

Appendix 1

Figure 1

Mechanisms of therapeutic action.



Appendix 2

Figure 2

HA hydrogel reversed pain (hyperalgesia) in rats using Hargreaves test

