



Extracellular Matrix Scaffold for TMJ Disc Repair

Clinical Need

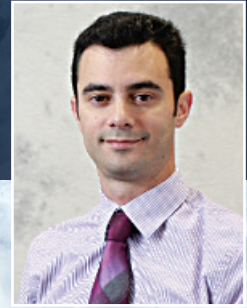
Individuals suffering from severe Temporomandibular Joint (TMJ) disc disease experience painful clicking or locking that can dramatically affect quality of life. Total TMJ reconstruction is often the last-resort surgical intervention for the irreparably damaged joint. Current therapies include joint replacement using alloplastic implants or autogenous grafts; however, long term outcomes with alloplastic implants are unclear, while autogenous grafts are associated with donor site morbidity.

Solution

University of Pittsburgh team of Alex Almarza, PhD, Stephen Badylak, DVM, PhD, MD, William Chung, DDS, MD, and Bryan Brown PhD is developing an extracellular matrix (ECM)-based scaffold device for the reconstruction of the TMJ. In particular, the device is designed to replace the meniscus of the temporomandibular joint (TMJ) by inducing the formation of new, patient-specific, functional tissue formation.

Competitive Advantage

Unlike currently available alloplastic implants, ECM-based device is biodegradable, and mimics the shape and size of native TMJ meniscus, without the need for autologous tissue harvesting. The device has been validated in canine and porcine models, where the scaffold demonstrated rapid transformation into a fibrocartilagenous tissue with biomechanical and biochemical properties similar to the native TMJ disc, as well as elicited formation of near-normal tissues in only one month following implantation.



Alejandro Almarza, PhD
University of Pittsburgh

"This technology will provide an off-the-shelf solution for the repair of the TMJ disc."

www.dental.pitt.edu/person/alejandro-j-alarza

How the ITP Program Supports this Project

The long-term objective of this program is the development of a safe and effective therapeutic option for reconstruction of the TMJ disc. In preparation for submission to the FDA, the ITP program will support the validation of devices made in a GMP facility, and for the submission of a pre-IDE application to the FDA.

Clinical Translation Pathway

Publications:

Brown BN, Chung WL, Pavlick M, Reppas S, Ochs MW, Russell AJ, Badylak SF. "Extracellular matrix as an inductive template for temporomandibular joint meniscus reconstruction: a pilot study." *J Oral Maxillofac Surg.* 2011 Dec;69(12):e488-505. (<https://www.ncbi.nlm.nih.gov/pubmed/21684655>)

Brown BN1, Chung WL, Almarza AJ, Pavlick MD, Reppas SN, Ochs MW, Russell AJ, Badylak SF. "Inductive, scaffold-based, regenerative medicine approach to reconstruction of the temporomandibular joint disk." *J Oral Maxillofac Surg.* 2012 Nov;70(11):2656-68. (<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3368066/>)

Intellectual Property:

US 9,314,340 Joint bioscaffolds (<https://patents.google.com/patent/US9314340B2/en>)

Commercialization Strategy:

In development with the MPWRM Commercialization/Market Needs Core

Regulatory Pathway:

In development with the MPWRM Regulatory Core

Product Launch Strategy:

In development with the MPWRM Commercialization/Market Needs Core

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