

NIAMS Director's Letter on Re-Join Consortium

The following letter was posted on October 27, 2022 on the National Institutes of Arthritis and Musculoskeletal and Skin Diseases website:

<https://www.niams.nih.gov/about/about-the-director/letter/new-re-join-consortium-awards-seek-understand-pain-signals-joints>

Dear Colleagues,

Understanding and treating joint pain is important to improving long-term health—and a fundamental part of the NIAMS mission. With that imperative in mind, I'm delighted that NIAMS is supporting a new Consortium that may lead us closer to ultimately being able to restore joint health. The [Restoring Joint Health and Function to Reduce Pain \(RE-JOIN\) Consortium](#) is part of the [Helping to End Addiction Long-term® Initiative](#), or [NIH HEAL Initiative®](#), an aggressive, trans-



NIH effort to speed scientific solutions to stem the national opioid public health crisis. Launched in April 2018, the initiative is focused on improving prevention and treatment strategies for opioid misuse and addiction, and enhancing pain management.

RE-JOIN will bring together multiple research teams to create 3-D maps of the different types of sensory neurons found in two important joints of the body: the knee and the **temporomandibular joint (TMJ), better known as the jaw joint**. This research aims to discover how neurons from these different joints influence and create the sensation of pain, which could potentially lead to novel, more precise therapies for reducing joint pain and deterioration—as well as restoring healthy joints.

Importantly, joint pain is often cited as a contributing factor by a majority of those living with opioid use disorder. By understanding how nerves are distributed throughout the different tissues of the joint (e.g., innervation) and using that information to develop more effective therapies, we can potentially reduce the burden of opioid dependency and eventually help bring an end to

the opioid epidemic.

The [five newly awarded projects](#) provide a unique balance and focus on the knee – one of the most stressed joints in the body – and the **TMJ, one of the most understudied joints in the body**. All of these projects will use cutting-edge technologies, unique methodologies, and a broad array of animal models and human samples to help develop the 3-D innervation maps, which in turn may serve as a blueprint for future research on the innervation of other joints. There will also be a focus on understanding how these types and patterns of sensory and sympathetic neuron networks in joints change with disease and aging and how they differ between individuals depending on age, sex, or disease.

The RE-JOIN Consortium will leverage two data management cores within the NIH Common Fund's [Stimulating Peripheral Activity to Relieve Conditions \(SPARC\) program](#), which specializes in the innervation of the soft organs. These cores will serve as RE-JOIN coordinating centers for data and visualization.

The RE-JOIN awards are five-year awards funded by the NIH HEAL Initiative, and NIAMS – the principal NIH institute funding research related to musculoskeletal diseases – will administer them. Other NIH Institutes and Centers participating in the RE-JOIN Consortium include: the National Center for Complementary and Integrative Health; the National Institute of Biomedical Imaging and Bioengineering; the National Institute of Dental and Craniofacial Research; the National Institute of Neurological Disorders and Stroke; and the National Institute on Aging.

Understanding and mapping the innervation of joints is only the first step towards developing targeted therapies that can help reduce and potentially eliminate opioid dependency. I am eager to see how RE-JOIN may transform the treatment of joint pain and the maintenance of joint health.

The 2022 RE-JOIN Awardees focused on the TMJ are:

Armen N. Akopian; Mario Danilo Boada; Malin Ernberg; and Lindsey J. MacPherson

University of Texas Health Science Center

Award Amount: \$4,698,102

Grant Years: Sept. 2022-August 2025

[Comprehensive Functional Phenotyping of Trigeminal Neurons Innervating Temporomandibular Joint \(TMJ\) Tissues in Male, Female and Aged Mice, Primates, and Humans With and Without TMJ Disorders \(TMJD\)](#)

Dr. Akopian and his team will use two animal model systems and TMD patients and a variety of cutting-edge techniques to identify the type and distribution of trigeminal nerves that innervate the tissues of the temporomandibular joint focusing on the joint muscles and tissues surrounding the condyle. They will explore differences in this innervation in males and females with and without painful TMD, how trigeminal nerve function changes over time during aging and in the progression of TMD, and ultimately identify potential new therapeutic targets to treat disease.

Christopher Ryan Donnelly; Dawen Cai; and Joshua James Emrick
Duke University

Award Amount: \$5,734,530

Grant Years: Sept. 2022-August 2025

[Neural Architecture of the Murine and Human Temporomandibular Joint](#)

Dr. Donnelly and his team will use molecular imaging and genetic techniques to map the neurons innervating tissues of the temporomandibular joint in mice and TMD patients. This team also will establish a biobank of human temporomandibular joint tissues from healthy donors and patients with painful TMD and use these tissues to fully characterize the neuronal distribution of temporomandibular joint tissues. The resulting data will be widely available for further analysis by other TMD researchers.

Kyle D. Allen and Alejandro Jose Almarza
University of Florida

[Innervation of the Knee and TMJ](#)

Award Amount: 5,878,996

Grant Years: Sept. 2022-August 2025

Dr. Allen and his team will examine the relationship between temporomandibular joint pathology and joint pain using molecular nerve tracing and nerve function techniques coupled with measures of joint pain and disability. They will use these techniques to examine how nerves change with aging, sex, and osteoarthritis severity in rodents and in humans with and without TMD. Importantly, measurement of these changes will be paired with extensive behavioral measures to evaluate the clinical significance of the relevance of the rodent studies to the human condition.

November is TMJ Awareness Month

Learn more



Research Grant Opportunities: A Call for Applications

The Intersection of Sex and Gender Influences on Health and Disease

The purpose of this Funding Opportunity Announcement (FOA) is to invite R01 applications on the influence and intersection of sex and gender in health and disease, including: (1) research applications that examine sex and gender factors and their intersection in understanding health and disease; and (2) research that addresses one of the five objectives from Strategic Goal 1 of the 2019-2023 [Trans-NIH Strategic Plan for Women's Health Research](#)

"Advancing Science for the Health of Women." The awards under this FOA will be administered by NIH ICs using funds that have been made available through the Office of Research on Women's Health (ORWH) and the scientific partnering Institutes and Centers across NIH.

<https://grants.nih.gov/grants/guide/rfa-files/RFA-OD-22-028.html>

Notice of Special Interest (NOSI): Research on the Health of Women of Understudied, Underrepresented and Underreported (U3) Populations (Admin Supp Clinical Trial Optional)

The TMJA welcomes the announcement by the NIH Office of Research on Women's Health of the availability of Administrative Supplements to support research on the health of women in understudied, underrepresented, and underreported populations in biomedical research. The prevalence of TMJ is higher in women and yet support for biomedical research specifically targeted to sex and gender topics in TMJ is lacking. Clearly, more research is needed to address molecular, genetic, musculoskeletal, endocrine, neurological, and bio-behavioral aspects of TMJ in women. We hope this announcement will result in many new avenues of research that will clarify the causes of TMJ, elucidate the arc of disease progression, and ultimately, hasten the development of precision treatments for TMJ patients.

<https://grants.nih.gov/grants/guide/notice-files/NOT-OD-22-031.html>

FY22 Chronic Pain Management Research Program

The US Department of Defense Chronic Pain Management Research Program invites scientists to submit pain research applications under three targeted areas: Clinical Exploration Award, Investigator-Initiated Research Award and Translational Research Award. Pre-applications are due July 12, 2022.

For additional information, please visit: <https://cdmrp.army.mil/funding/cpmrp>



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inspiration just to
get through each day.”**

- The TMJ Association, Ltd.

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About The TMJ Association...*Changing the Face of TMJ*

The TMJ Association, Ltd. is a nonprofit, patient advocacy organization whose mission is to improve the quality of health care and lives of everyone affected by Temporomandibular Disorders (TMJ). For over 30 years, we have shared reliable information on TMJ with people like you. We invite you to visit our website, www.tmj.org.



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