



FNIH Biomarkers Consortium Study Advances Strategic Imaging and Fluid Biomarkers that Predict Structural Change and Pain Progression in Knee Osteoarthritis

Novel MRI, serum and urine biomarkers predict the progression of OA beyond current radiographic measures of change in joint space width, paving the path for regulatory qualification and new disease-modifying drug regimens

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BETHESDA, MD – Today, the [Foundation for the National Institutes of Health](#) (FNIH) announced the results from a three-year research study that prioritizes and advances the best biological markers (biomarkers) to measure and predict structural changes and treatment responses in osteoarthritis (OA)—one of the most prevalent and disabling diseases in the world. Using longitudinal MRI, serum and urine data from nearly 5,000 patients with knee OA and controls, researchers were able to narrow thousands of biomarkers down to a select few that measure significant changes in the structure of cartilage and bone of knee OA patients and the pain they experience.

This \$3.4M study determined which biomarkers have greater prognostic ability to measure early progression of structural and symptomatic changes in the joint over time and which are likely to predict treatment response better than the radiographic measurement of narrowing of joint space in knee OA patients—the existing but outmoded “gold standard” biomarker of knee OA. These new biomarkers are candidates for follow-on studies for evaluation and use in regulatory decision-making. They will enable stratification and clinical trial enrichment of those patients at the highest risk for OA progression, thereby facilitating smaller, shorter trials of new OA treatments.

The study was conducted by a team of leading OA scientists and clinicians led by David J. Hunter, M.D., Ph.D., from the University of Sydney in Australia and Virginia Byers Kraus, M.D., Ph.D., from Duke University. The study was carried out under the auspices of the FNIH-managed [Biomarkers Consortium](#) in collaboration with the Osteoarthritis Research Society International (OARSI) and supported by several pharmaceutical and OA advocacy organizations. The research relied on data from the National Institutes

of Health (NIH) [Osteoarthritis Initiative](#) (OAI), a multicenter, longitudinal, prospective, observational study of knee OA.

“Currently, our management of osteoarthritis in the clinic is hindered by the lack of valid and responsive biomarkers for disease progression. Current treatments are only palliative (focused only on symptoms) and not focused on the joint disease which includes structural changes,” said Drs. Hunter and Byers Kraus. “This new panel of biomarkers for OA enables us to focus on the joint structure as well as symptoms, which is quite distinct from treating the symptoms alone as reported by patients. These biomarkers could lead to improved individualized care for OA patients and the identification of new treatment targets and mechanisms for more efficient trials of disease-modifying agents.”

Estimates suggest that knee OA affects approximately 250 million people globally, including approximately 27 million Americans. At present, there are no drugs or treatments that modify the onset or progression of OA, and only radiography (x-ray) is used to determine structural progression of the disease.

“This study is an important step forward on the path to qualifying OA biomarkers for use in clinical research and ultimately to enable the development of treatments for this debilitating disease,” said Janet Woodcock, M.D., Director of the Center for Drug Evaluation and Research at the U.S. Food and Drug Administration (FDA).

“Using the Consortium’s collaborative approach, we brought together resources and expertise from academia, NIH, FDA and industry to develop these new biomarkers,” said Maria C. Freire, Ph.D., FNIH President and Executive Director. “The approach of involving public and private sector entities was essential to the success of this study.”

The study was built upon the resources of the NIH OAI, which established a natural history repository of OA medical images, patient data and biospecimens more than a decade ago for this type of research. Data and results from this study also are being returned to and made publicly available through the OAI database. “It is wonderful that the OAI resource is being leveraged in a way that advances the field and allows us to learn how to modify the course of osteoarthritis, as we have successfully done with other diseases,” said Stephen I. Katz, M.D. Ph.D., Director of the National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS).

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About the Foundation for the NIH

The Foundation for the National Institutes of Health creates and manages alliances with public and private institutions in support of the mission of the NIH, the world's premier medical research agency. The Foundation, also known as the FNIH, works with its partners to accelerate biomedical research and strategies against diseases and health concerns in the United States and across the globe. The FNIH organizes and administers research projects; supports education and training of new researchers; organizes educational events and symposia; and administers a series of funds supporting a wide range of health issues. Established by Congress in 1996, the FNIH is a not-for-profit 501(c)(3) charitable organization. For additional information about the FNIH, please visit www.fnih.org.

About the NIH Osteoarthritis Initiative

The OAI is a public-private partnership comprising five contracts (N01-AR-2-2258; N01-AR-2-2259; N01-AR-2-2260; N01-AR-2-2261; N01-AR-2-2262) and led by NIAMS and the National Institute on Aging (NIA). Private sector funding partners included Merck Research Laboratories, Novartis Pharmaceuticals Corporation, GlaxoSmithKline, and Pfizer Inc. Private sector funding for the Consortium and OAI is managed by the Foundation for the National Institutes of Health.

References

Hunter DJ et al., Biomarkers for osteoarthritis: current position and steps towards further validation. *Best Pract Res Clin Rheumatol*. 2014 Feb;28(1):61-71. doi: 10.1016/j.berh.2014.01.007. Review

Eckstein F et al., Cartilage thickness change as an imaging biomarker of knee osteoarthritis progression - data from the fnih OA biomarkers consortium. *Arthritis Rheumatol*. 2015 Aug 28. doi: 10.1002/art.39324.

Hunter DJ et al., Longitudinal validation of periarticular bone area and 3D shape as biomarkers for knee OA progression? Data from the FNIH Osteoarthritis Biomarkers Consortium. Accepted for publication in *Ann Rheum Dis* Sept 2015.