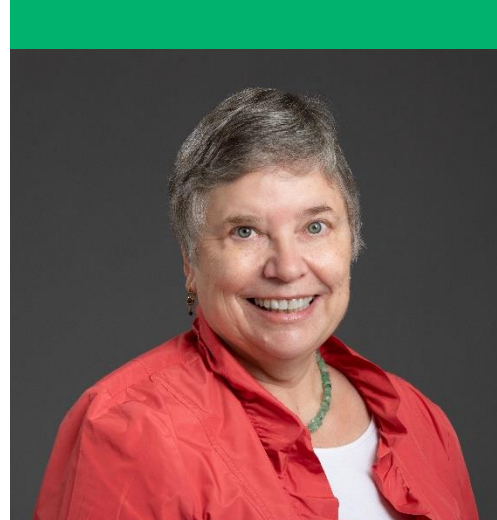


Anna Plaas, PhD

The Robert S. Katz, MD - Joan and Paul Rubschlager Presidential Professor of Osteoarthritis Research



Advancement of Medicine

In 2025, your generosity continued to support my work as a scientific mentor for and collaborator with faculty involved in musculoskeletal disease and therapies research with a

goal towards implementing new information in clinical settings. We continue to conduct preclinical and patient-based research to explore dietary mineral supplementation to prevent ectopic muscle calcification after severe trauma, test novel drug delivery platforms to slow joint tissue and gut tissue damage in rheumatoid arthritis, identify prognostic markers for implant loosening, and finally defining new ways to modulate T-cell activation in autoimmune diseases. I continue my service to the scientific community as a grant and paper reviewer and have served as the Organizing Chair of the 2025 Conference in Hyaluronan Sciences.

Research

I continue to work on collaborative research with **Thea Price, MD**, at the Mayo Clinic in Fort Lauderdale, Florida. We have submitted a manuscript to *Calcified Tissue International* titled “Effect of dietary magnesium on heterotopic muscle calcification” describing our data with a preclinical animal model of posttraumatic muscle calcification and parallel patient data. We are also in the process of negotiating a contract with a Biotech Company to support the clinical work.

In collaboration with **Meghan Moran, PhD**, in the Department of Anatomy and Cell Biology at Rush, we have published a paper in *PLOSOne* in which we describe the novel discovery that a self-limiting inflammatory insult to the joint, such as post-injury or an inflammatory episode in osteoarthritis, results in a protective response of the intestinal tissue. A second manuscript is in preparation, in which we report the breakdown of this protective response following chronic or repetitive inflammatory insults, such as occurs in implant loosening, rheumatoid arthritis or advanced osteoarthritis. In addition to the



clinical relevance of this research, we also report on a novel serum marker for acute vs chronic joint inflammation and application of 'big data' generating methodology, RNA sequencing that is performed by the **Rush Genomics Core**.

Through a collaboration with **Georgia Papavasiliou, PhD**, chair of the Department of Chemical Engineering at Illinois Institute of Technology, we have made substantial progress on the development of targeted drug delivery to the knee joints to slow bone and cartilage damage in rheumatoid arthritis, which we are testing in a preclinical animal model. We expect that our submitted proposal to the National Institutes of Health will result in funding by the end of 2026. We have one paper in press in *Journal of Tissue Engineering and Regenerative Medicine*, and a second paper is under review.

I have been sharing my expertise on extracellular matrix cell biology in a collaboration with **Joseph Reynolds, PhD**, at Rosalind Franklin University. He is studying the role of T cells in multiple sclerosis and has discovered that hyaluronan on the outside of T cells regulates their involvement in neurodegeneration. He is using one of the mouse strains bred in my laboratory for this work and we also have provided him with specialized reagents to perform imaging T cell extracellular matrix for this work. We have submitted a grant proposal to NIH requesting funds to further explore the mechanisms and clinical and therapeutic value of this research. We also plan to extend this research to investigate whether our findings are relevant to T-cell involvement in rheumatoid arthritis. This will be performed in collaboration with the Division of Rheumatology at Rush under approved protocols to obtain patient-derived T-cells.

Clinical Work

Dr. Moran will be providing expertise in preclinical animal model work, biomarker analyses of human tissue and synovial fluid. Dr. Papavasiliou will develop the drug delivery aspects of this collaboration. In collaboration with Dr. Reynolds, the Division of Rheumatology at Rush will provide patient-derived T-cells under approved protocols.

Educational Endeavors

Your support enabled me to teach methodologies and research concepts in collaboration with my mentees as well as the above-mentioned collaborations with Drs. Papavasiliou and Reynolds. This



allows the research direction during the 19 years I have held this endowed chair to be continued by early-career faculty while we also investigate novel methods for drug delivery to inflamed tissues.

Grants

- Drs. Papavasiliou, Moran and I have submitted a proposal to the NIH. I serve as subcontract principal investigator for Rush
- I am a co-investigator on an NIH grant submitted by Dr. Reynolds on T cell activation in multiple sclerosis

Service

- **Organizing Committee Chair:** International Society for Hyaluronan Sciences 2025 Conference, Q Center, in St. Charles, Illinois, June 8-13. This meeting was attended by 150 scientists from the U.S., Europe and Asia, and included basic researchers, clinicians and industry representatives. It was a highly successful event, providing both scientific sessions and social events for new collaborative efforts.
- I am a consulting member of the Organizing Committee for the next Hyaluronan conference to be held in Porto, Portugal, in June 2027.
- I continue my editorial duties for *Osteoarthritis and Cartilage* and review responsibilities for several other musculoskeletal research journals, including the *Journal of Orthopedic Research*, *Journal of Cartilage and Joint Preservation*, Public Library of Science *PLOS One*, and *Cells*.

Publication and Presentations – Abbreviated

- *Evidence of an allostatic response by intestinal tissues following induction of joint inflammation* Meghan M. Moran, Jun Li, Quan Shen, Sheona P. Drummond, Caroline M. Milner, Anthony J. Day, Ankur Naqib, D. Rick Sumner, Anna Plaas *PlosOne* Published: January 23, 2026 <https://doi.org/10.1371/journal.pone.0338053>
- *Pirfenidone attenuates fibrosis and neovascularization in 3D spheroid-laden hydrogel culture* Rayan Abdulhadi, Jorge Rodrigo Pintado, , Mohammed AbuAlia, Shadi Motamed, Meghan



Moran, Marcella Vaicik, Markus A. Wimmer, Anna Plaas, and Georgia Papavasiliou in press
Journal of Tissue Engineering and Regenerative Medicine

- *Naïve CD4+ T cells synthesize a hyaluronan-rich glycocalyx that is degraded upon activation.* LP Adhikari, Jessica Contreras, Kristen M. Patterson, Meghan M. Moran, Erin N. Howe, Anna H. K. Plaas, Joseph M. Reynolds, submitted Dec 2025 in review *iScience*
- *Nanoparticle Tracking and Auto fluorescence-Blocked Confocal Imaging Reveal Tissue-Level Nanoparticle Bio distribution Following Intra-Articular Injection of Fluorescently Labeled Biocompatible Nanoparticle Emulsions* Rayan Abdulhadi, Jun Li, Meghan Moran, Anna Plaas, PhD, and Georgia Papavasiliou, submitted Dec 2025 in review *Tissue Engineering Part C: Methods*

The Year Ahead: 2026 and Beyond

I will continue my collaborations within Rush, Mayo Clinic, IIT and Rosalind Franklin University. My primary input is guiding and supporting the preparation of experimental protocols, providing mouse strains, data evaluation, publication processes and grant submissions.

With Gratitude

As always, my mentees, collaborators, their trainees and I all continue to thank you for your ongoing support and interest in our progress and successes. Our ongoing, state-of-the-art research in musculoskeletal diseases at Rush is enabled through your generosity and is especially crucial at this uncertain time with disruptions in federal funding for medical research and increasingly limited resources of other funding agencies.