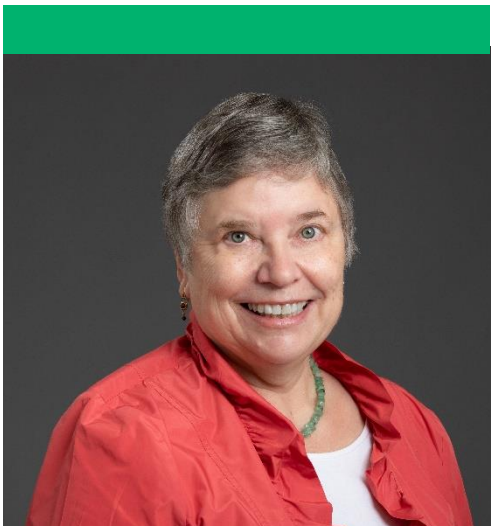
RUSH

Anna Plaas, PhD



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

Advancement of Medicine

In 2024, your generosity continued to support my work as a scientific mentor and collaborator for faculty involved in musculoskeletal disease and therapies research, strengthening those collaborations in translational medicine. The projects include ectopic muscle calcification after severe trauma, finding novel targets and therapeutics to slow joint tissue and gut tissue damage in rheumatoid arthritis, and diagnostic markers and preventive therapies for arthrofibrois as a result of orthopedic surgeries. 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 my involvement with my faculty mentees. **Thea Price, MD**, is a surgeon and continues her search for ways to prevent post trauma muscle degeneration. Dr. Price has now moved to the Mayo Clinic in Fort Lauderdale, Florida, but we are continuing our collaboration with a biomedical company in Boston to test one of their biologics for prevention of calcification of muscle after burn injuries.

Meghan Moran, PhD, continues to acquire proficiency in cell biology of joint inflammation and has two research papers under review. She will also deliver an invited presentation at the International Society for Hyaluronan Research. Dr. Price has submitted one paper in review reporting the data from our ongoing research collaborations with Inozyme.

Through the 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 for rheumatoid arthritis.

As an extension, we have now initiated a collaboration with **Brian Cole, MD, MBA**, and **Adam Yanke, MD, PhD**, in the Department of Orthopedic Surgery at Rush to develop diagnostic markers and preventive therapies for arthrofibrosis, a common complication of joint replacement surgeries. To support these projects, we have grants pending review by the Rheumatology Research Foundation and the National Institutes of Health.

Most recently I have started to share my expertise on extracellular matrix cell biology on 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.

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.

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 18 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 and the Rheumatology Research Foundation to support our work on Rheumatoid Arthritis.
- We have submitted a second proposal to the NIH to support our collaboration with Drs. Cole and Yanke.
- I am a co-investigator on an NIH grant submitted by Dr. Reynolds on T cell activation in Multiple Sclerosis

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Service

Organizing Committee Chair: International Society for Hyaluronan Sciences 2025 Conference, Q Center, in St. Charles, Illinois, June 8-13. We are expecting ~140 attendees form the U.S., Europe and Asia.

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*. Finally, I continue to chair grant review sessions for the Department of Defense-sponsored research grant proposals.

I am currently an adhoc reviewer for the French National Research Agency, or ANR.

Publication and Presentations – Abbreviated

- "Joint inflammation induces altered mucin metabolism and microbiome changes in the ileum and colon," BMC Musculoskeletal Disorders April 2025.
- "Pirfenidone attenuates in vitro fibroblast outgrowth and neovascularization in spheroid-laden Poly(ethylene) glycol hydrogel-based scaffolds " Tissue Engineering May 2025
- 2 talks at the HA2025 meeting June 2025.

The Year Ahead: 2025 and Beyond

I will continue my collaborations within Rush, IIT and Rosalind Franklin University. My primary input is in guidance and support in the preparation of experimental protocols, 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 federal funding changes for medical research and health care.