

# JOINT *Matters*



## FEATURED IN THIS STORY:



Anna Helena Jonsson, MD, PhD, University of Colorado Anschutz Medical Campus



Stanley Cohen, MD, Rheumatology Associates of North Texas.

## Predictive Biomarkers for the Treatment of Rheumatoid Arthritis

Advances in drug discovery, electronic health records and biomarkers have accelerated the shift toward precision medicine. However, progress in targeting the right drug to the right patient has yet to be achieved across diseases. In particular, the therapeutic armamentarium for rheumatoid arthritis (RA) is met with treatment strategies that have primarily remained one-size-fits-all, which is inconsistent with the goal of personalized care and maximizing health outcomes for patients. This treatment approach, however, is expected to change with the development of novel biomarkers that can guide treatment selection for RA.

Currently, biomarkers for diagnosing RA are routine in clinics: Blood-based

tests measuring rheumatoid factor, autoantibodies to citrullinated proteins, erythrocyte sedimentation rate or C-reactive protein can often confirm the presence of disease. Further, for patients with a positive diagnosis, an array of treatments is available to halt or at least slow disease progression. However, the treatment protocol is fixed and does not consider the variability of the disease pathology and severity among individuals with RA. And so, many patients often go through several unsuccessful treatments before landing on a treatment strategy that works for them.

“The goal of the treat-to-target strategy is to get the disease in as much remission as we can as quickly

as possible because the faster you get somebody's inflammation under control when they're first diagnosed, the better their long-term outcome," said Anna Helena Jonsson, MD, PhD, assistant professor of medicine-rheumatology at the University of Colorado Anschutz Medical Campus. "If we had some sort of test that can indicate that they need medication X, we would be able to get them to low disease activity in a matter of a few weeks as opposed to in a few months to maybe a year."

What is therefore needed are tests that are specific to rheumatoid arthritis and that capture the pathologic signatures in

Unraveling the biological processes leading to inflammation in the synovium is crucial to developing novel biomarkers for rheumatoid arthritis. But when these are identified and ready for clinical use, collecting synovial samples from patients for testing presents a challenge.

"The problem is that most rheumatologists don't routinely do synovial biopsies. There are an increasing number of people who are learning how to do these needle biopsies, which are much less invasive. Still, very few rheumatologists have the skill or the time to do them," said Dr. Stanley Cohen, MD, a physician at Rheumatology Associates of North Texas.



the joint. In a [2023 Nature study](#) supported in part by the Arthritis Foundation through the National Institutes of Health's [Accelerating Medicines Partnership](#), researchers, including Dr. Jonsson, found that synovial tissue from the joints of patients with RA could be classified into six categories based on inflammatory cell type and state, further supporting that RA is a heterogeneous disease, and this heterogeneity could be the basis of variability in patient treatment responses. Further, the inflammatory cell type milieu could change over time, which can potentially render medications that once worked for the patient to become less effective.

Looking ahead, the consensus among experts in the field is that biomarker tests will be blood-based tests. There is already progress: Blood-based test [PrismRA](#), already available for clinical use, predicts non-response to TNF inhibitors. Active research is also underway to find blood-based biomarkers that can classify different patterns of synovial pathology to forecast treatment response for even more therapies.

To support research into biomarkers, the Arthritis Foundation has invited applications for its 2024 Rheumatoid Arthritis Research Program awards. [Learn more about the Foundation's Rheumatoid Arthritis Research Program.](#)

## ADVOCACY UPDATE

Copay accumulators have prevented copay assistance from drug manufacturers from counting toward patients' deductibles and maximum out-of-pocket spending, which has a tremendous impact on those living with chronic diseases. [An important U.S. District Court ruling from last year](#) now ensures that health plans include copay assistance in patient cost-sharing, effectively prohibiting insurance companies and pharmacy benefit managers from using copay accumulators. However, the federal government has not issued any enforcement guidance, and consequently many health plans are not yet compliant.

You can help by encouraging your congressional representatives and senators to contact the Department of Health and Human Services and the Labor Department and urge them to issue enforcement guidance. Interested in taking action? [Visit the Arthritis Foundation's Action Center.](#)

## Clinical Rheumatology Fellowship 2018-2023



Fellowships awarded by the Arthritis Foundation funded between 2018 and 2023. Dr. Campbell was one of the five 2020 Arthritis Foundation grant awardees at the Seattle Children's Hospital.

### FEATURED IN THIS STORY:



Julie Campbell, MD, Logan Health Specialty Care – Missoula

## Fellowship Awardee Now the First Pediatric Rheumatologist in Montana

With support from the Foundation's clinical rheumatology fellowship, Julie Campbell, MD, is now the first full-time pediatric rheumatologist in Montana. Dr. Campbell was one of the five 2020 Arthritis Foundation grant awardees during her fellowship at the Seattle Children's Hospital. During that time, she also completed two years of research on improving referrals to pediatric rheumatology for rural patients and obtained a master's in health administration from the University of Washington.

Dr. Campbell, a Montana native, is currently serving patients at Logan Health Specialty Care - Missoula. Her top areas of expertise are osteomyelitis in children and juvenile idiopathic arthritis.

The acute shortage of pediatric rheumatologists in the United States is detrimental both to children with rheumatic diseases needing treatment and to medical trainees desiring to specialize in pediatric rheumatology. Recognizing the urgent need for pediatric rheumatologists, the Arthritis

Foundation is leading the way by expanding the number of fellowship opportunities for rheumatologists, focusing on communities with the most significant shortages. Dr. Campbell's decision to practice pediatric rheumatology in Montana after her fellowship training is an important outcome for the Foundation's rheumatology program.

"We at the Arthritis Foundation are extremely proud of Dr. Campbell's professional achievements, and we are even more delighted that children with rheumatic diseases in Montana have a provider within their home state," said Steven Taylor, President and CEO of the Arthritis Foundation. "This is indeed a feather in the cap for our clinical rheumatology fellowship program."

Dr. Campbell completed her fellowship in 2023. She is board-eligible and will apply for certification in the spring of 2025.

[Learn more about the Foundation's Clinical Rheumatology Fellowship Program.](#)



## “Synovium-on-a-Chip” Could Personalize Rheumatoid Arthritis Treatment

### FEATURED IN THIS STORY:



Theresa Wampler Muskardin, MD, Hospital for Special Surgery

Although several varieties of therapeutic drugs are available for treating rheumatoid arthritis (RA), many patients do not achieve long-term remission. Thus, understanding the biological underpinning of why some people with RA respond to treatment while others do not is an urgent clinical need.

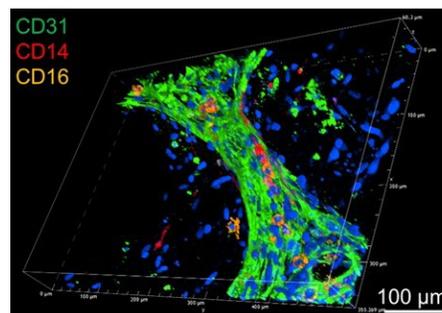
To fill this knowledge gap, the Arthritis Foundation has awarded an RA research program award to Theresa Wampler Muskardin, MD, assistant professor of medicine and pediatrics at the Hospital for Special Surgery. With monetary support of \$450,000 over three years, Dr. Wampler Muskardin’s team will leverage their expertise in “organ-on-a-chip” technology to understand the cellular and immune events in the synovium that correlate with treatment responses in RA patients.

“The big gap now is trying to understand the biology of the RA patients that do not respond to treatments,” said Dr. Wampler Muskardin. “To answer that question, we will use our synovium-on-a-chip – the first vascularized, immunocompetent system that uses the patient’s own joint tissue – to test therapies that are already approved and ones that have not yet been tested for RA.”

The treatment options for RA have significantly expanded in the past decades. As the standard of care, patients are first prescribed conventional disease-modifying drugs (DMARDs), for example, methotrexate, before moving on to biologic DMARDs (and their biosimilars) in combination with methotrexate. If the addition of biologics, such as TNF inhibitors, do not alleviate symptoms, JAK inhibitors may be introduced. Cycling through RA treatments in search of one that eventually works often takes three to four months at a time, which can be very distressing for patients who do not respond to initial treatments.

“We know that remission at three months is the greatest predictor of long-term remission, and our goal is to help patients achieve remission at three months after diagnosis,” said Dr. Wampler Muskardin. “And yet, we have a mandated treatment approach where we know that most patients are not going to achieve low disease activity or remission at the end of three months.”

While the current approach is still the gold standard for treating RA, there is active research in predicting treatment responses so that patients are quickly matched to medications that will work for them. In that effort, Dr. Wampler Muskardin’s team will collect synovial tissue from RA patients and then assign them to groups based on



Microscopic view of the synovium-on-a-chip. Lining of bioengineered blood vessels in green. Monocytes (labeled red and orange) are either attached to the blood vessels or have extravasated into the synovial tissue (blue).

the tissue’s cellular composition. Dr. Wampler Muskardin’s collaborator, Weiqiang Chen, PhD, associate professor of mechanical and aerospace engineering and biomedical engineering at New York University, will then load the synovial tissue cells from each patient onto a microfluidic cell culture device – the synovium-on-a-chip.

Uniquely, this device recreates the complex environment of the joint. It contains different cell types and compartments found in the joint, bioengineered blood vessels and a central reservoir for loading immune cells isolated from RA patients’ bloodstream.

With this technology, the reservoir can be laden with white blood cells, particularly the monocytes (known to be pathogenic in RA), which can be studied as they transverse through the blood vessels into synovial tissue. More importantly, the synovium-on-a-chip allows the team to study the effect of the synovial tissue signaling on monocytes, a process that could be altered in patients who are not responding to medication. In addition, this system will allow testing and comparing the effects of different therapies among patients who have been grouped by their synovium cellular content.

“I am grateful to the Arthritis Foundation for their support,” said Dr. Wampler Muskardin. “The award is critical to move this important research forward. I’m very thrilled about this opportunity.”

In addition to Drs. Wampler Muskardin and Chen, the team includes Timothy Niewold, MD, director of the Barbara Volcker Center for Women and Rheumatic Disease and vice chair for research in the Department of Medicine at the Hospital for Special Surgery.



## Strategies to Diversify Rheumatology Care

The journal *Arthritis & Rheumatology* on Jan. 19, 2024, published "[Improving Health Equity in Rheumatology Through Workforce Diversification and Support for Health Equity Research and Education](#)," authored by Arthritis Foundation staff members and experts in diversity, equity and inclusion (DEI) research or medical education. This peer-reviewed paper includes strategies for recruiting, retaining and training medical students from historically underrepresented communities as a way of tackling the ongoing shortage and lack of diversity in the rheumatology workforce.

The number of practicing rheumatologists cannot meet the overwhelming demand for rheumatology care, and this gap is expected to widen in the next decade. This shortage amplifies the lack of diversity in medical professionals in this workforce. Consequently, the racial and ethnic demographics of rheumatology providers do not reflect that of the [patient population](#). This [mismatch](#) needs to be addressed, because having providers representative of their communities leads to better patient outcomes.

Recognizing this pressing problem, the Arthritis Foundation hosted two [DEI Science summits](#) that brought together trainees and practitioners from historically underrepresented groups, people with arthritis and their families, medical school educators, research scientists, and [DEI experts](#) to

discuss challenges and opportunities for diversifying the rheumatology workforce.

The lessons from the two summits are presented as strategies and best practices for medical institutions interested in creating a sustainable pathway for medical trainees from historically underrepresented communities. These strategies include:

1. Long-standing commitment by institutions to measure the success of their DEI efforts over time with suitable tracking metrics.
2. Establishing regional mentoring programs to promote representation.
3. Enhancing or developing new cultural sensitivity training courses for all residents and fellows with hands-on experiences with underserved populations.
4. Investing in [curricula](#) geared toward recruiting and retaining residents from historically underrepresented groups.

"One of the Arthritis Foundation's main priorities is to increase diversity in health care providers who treat arthritis," said Victoria Fung, senior vice president of mission and strategic initiatives. "We are delighted that through our manuscript, our recommendations for diversifying the workforce will reach a broad rheumatology audience who share our commitment toward attracting, retaining and cultivating diverse medical talent at their institution."

## Announcements



### Request for Proposals: Rheumatoid Arthritis Research Program

The Arthritis Foundation is inviting applications that seek to better understand and predict the progression of RA, including from pre-RA to clinical RA, and progression to more severe disease. Competitive projects should aim to define risk factors/biomarkers of disease progression, pathogenic mechanisms, and approaches to prevent or slow RA disease onset and progression. The long-term goal of this Arthritis Foundation research program is to reduce the incidence of RA and slow disease progression.

Request for proposals opened on Feb. 21, 2024, and letters of intent are due on May 21, 2024. Letters of Intent can be submitted via [Proposal Central](#). The invitation is open to early- and mid-career investigators affiliated with U.S. academic institutions and hospitals who are committed to improving the outcomes of rheumatoid arthritis patients through biomedical and/or health outcomes research. [Access RFP](#). To view an information session on the RA RFP, view the [Zoom recording](#) by entering the passcode A##5ADCO.



### 2024 Rheumatoid Arthritis Research Summit, April 12–13, 2024

The Rheumatoid Arthritis Research Summit, co-hosted by the Arthritis Foundation and the Hospital for Special Surgery, will bring together leading clinical, basic and translational researchers to share research and approaches to care for individuals with rheumatoid arthritis. Sessions will focus on uncovering the underlying mechanisms of disease; ensuring that effective treatments are available to all patients; comorbid conditions are managed appropriately; and individuals with RA can more quickly receive the best drug for them. [Register to attend either in-person or virtually](#).



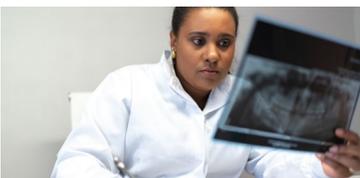
### Juvenile Arthritis Family Summit, St. Louis, Missouri, July 11–14, 2024

The annual JA Family Summit (previously known as the National JA Conference) is the Arthritis Foundation's signature, nationwide event for families affected by juvenile arthritis and childhood rheumatic diseases. This four-day educational conference focuses on health, wellness and fun for families, children/teens (ages 6 months and up) and young adults (ages 18-30) affected by JA and related childhood rheumatic diseases. [Learn more about registration, hotel reservations, travel assistance and volunteer opportunities](#).



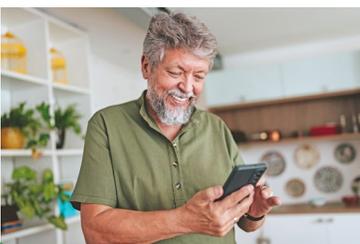
### TOPS Clinical Study: Now Recruiting Participants

The Osteoarthritis Prevention Study (TOPS), led by Wake Forest University, is the first study in the United States to examine weight loss and exercise as preventatives for osteoarthritis. In addition to the Arthritis Foundation (the largest private funder), support for this study comes from the Centers for Disease Control and Prevention and the National Institute of Arthritis and Musculoskeletal and Skin Diseases, among others. [Learn about the study and the qualification criteria for participation](#).



### Podcast: Why Diversity in Rheumatology Matters

In this episode of the Arthritis Foundation podcast series, 2023 Diversity, Equity and Inclusion awardee Angela Chun, MD, assistant professor of rheumatology at Lurie Children's Hospital with Feinberg School of Medicine at Northwestern University, discussed the disparity in health care in the U.S. — especially as it relates to arthritis — and explored how diversity among rheumatologists and in rheumatology care can improve health outcomes. [Listen to the full podcast](#).



### A Lupus App for Patients

With funding from the Patient-Centered Outcomes Research Institute (PCORI) and advisory support from the Arthritis Foundation, among other organizations, Jasvinder Singh, MD, MPH, professor of medicine and epidemiology at the University of Alabama at Birmingham, has successfully launched the "Manage-MyLupus" app for people with lupus. This tool was created for patients based on their needs, preferences and knowledge gaps. It contains information on lupus treatment and management. The free app is available in English and Spanish and can be downloaded on an Android phone at the Play Store and on an iPhone at the App Store.



## COMMUNITY IN ACTION

Make an impact! Join the Arthritis Foundation's signature events happening at a location near you.

**Walk to Cure Arthritis** is the largest arthritis gathering in the world, celebrating people living with arthritis while raising funds.

**California Coast Classic Bike Tour**, presented by Amgen, is a scenic bike ride that takes place over eight days and covers 525 miles along the coast on U.S. Highway 1. The tour starts in the heart of San Francisco and ends on the iconic strand of Los Angeles.

To learn more about our events and participate, [visit arthritis.org/events](https://www.arthritis.org/events).

## LET'S CONNECT!

To ensure you are receiving our most up-to-date communication from *Joint Matters*, [please visit our website](https://www.arthritis.org) to confirm your subscription.

You can also email us at [afscience@arthritis.org](mailto:afscience@arthritis.org) for queries and to unsubscribe from *Joint Matters*.

## 2024 National Events for Patient Education

### Live Yes! Connect Groups

The connect groups provide supportive social connections and are inclusive to parents/guardians of children or adults living with all types of arthritis and rheumatic diseases. These virtual or in person groups bring people together for fun social and informative educational events and activities focused on mutual support and positive coping strategies for living well. [Learn about our Connect Groups and upcoming events.](#)

### Living Well with OA, Pittsburgh, Pennsylvania, April 5, 2024, 8–2pm ET

This in-person educational event organized by the Foundation is for anyone who would like to learn more about arthritis including health care providers, patients and their caregivers. A session within the expo will be dedicated to OA that will cover many strategies, methods and approaches to make managing and living with osteoarthritis easier. [Register for the event.](#)

### Shades of Arthritis – Patient and Provider Perspectives, April 25, 6–7:15pm ET

In this webinar, health care providers and patients come together to address the unique challenges faced by individuals in the African American and Hispanic community living with arthritis. Community support and resources will be highlighted, emphasizing the importance of engaging with organizations tailored to the Black/African American and Hispanic community. Holistic approaches to arthritis management, encompassing lifestyle changes and the mind-body connection will be explored, encouraging participants to adopt a comprehensive approach to health. [Register to attend the webinar.](#)

### Advances in Arthritis Care, May 23, 2024, 6–7:15pm ET

This upcoming webinar on arthritis research will provide a comprehensive overview of current trends and breakthroughs shaping the field. Emphasizing collaborative efforts between researchers, healthcare professionals and patients, the webinar encourages active engagement with ongoing research initiatives and clinical trials, fostering a sense of empowerment within the arthritis community. [Register to attend the webinar.](#)