

## **We are grateful to all who participated in rheumatoid arthritis research at Rockefeller University.**

Research participants belong to a large community of people around the world who help researchers answer important health questions and discover new medical treatments. Without research participants, clinical research would not be possible. Our team is incredibly grateful. Here, we share with you a summary of our findings from a recent study.

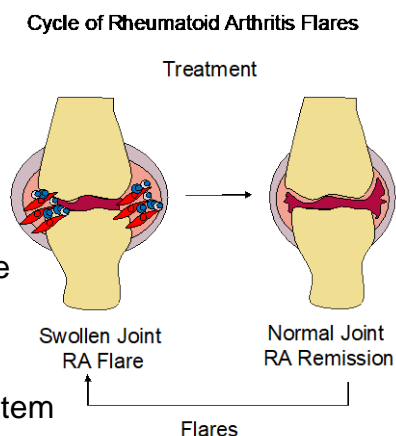
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### **What was this study about?**

Rheumatoid arthritis flares are hard to predict. Flares involve worsening joint symptoms such as pain, swelling and stiffness. Worsening symptoms make it hard to perform daily activities like bathing and dressing. Flares can also lead to missed work.

There are a few recognized causes of flares. Stopping some medications and giving birth are both well-known triggers. Flares can also occur without an obvious explanation. Some people have proposed that stress, over-exertion, changes in diet, or infections cause flares. There is little data to support these other hypotheses.

We conducted this study to learn more about the events leading to flares. We especially wanted to learn what happens in the immune system in advance of a flare.



### **What was done in this study?**

We studied a group of patients with rheumatoid arthritis to learn what happens in the immune system before flares. Patients recorded their symptoms and collected their own blood by finger stick at home. They collected finger sticks weekly, or more often during an active flare. Blood samples and symptom questionnaires were mailed to the laboratory for analysis. This new collection method enabled researchers at Rockefeller University to study blood samples just prior to flares and to identify what changes in the blood right before symptoms develop.

### **Who was studied?**

Women with rheumatoid arthritis joined the study, their age was between 40 and 65 years; and they were taking their usual RA medications during the study.

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### **What were the results of the study?**

We discovered a new type of cell called PRIME cells (PRe-Inflammatory MEsenchymal). PRIME cells are present in the blood of rheumatoid arthritis patients. The appearance of PRIME cells in the blood predicts a flare a week or two before symptoms start.

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PRIME cells are part of a series of immune events not yet fully understood. Before PRIME cells are activated, cells related to antibody production (B cells) appear in the blood. PRIME cells also share similarities with a type of synovial fibroblast that appear in joints affected by rheumatoid arthritis when inflamed. These types of synovial fibroblasts help other inflammatory cells to enter the joint, causing pain and swelling.

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### **How has this study helped patients and researchers?**

Discovering PRIME cells has opened a new area to study in understanding how arthritis develops. Finding a predictor of flare could lead to new approaches to detecting, treating, or even preventing flares. The results of the study reflect the particular people who were studied. Not all participants in each part of the study had the same results. The results cannot be assumed to be true for everyone.

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### **What were the limitations of this study?**

This was a small study. Researchers need to study many more patients to better understand this pattern of immune activation that occurs prior to rheumatoid arthritis flares. The study was too small to understand why some of the patients had a different immune pattern.

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### **Are there plans for further studies? Or what happens next?**

Now we will work to understand what activates B cells and then PRIME cells prior to rheumatoid arthritis flares. We will also continue to study flares to see if different immune events occur in different people.

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### **Who paid for this study?**

This study was funded by the Robertson Therapeutic Development Fund, Bernard and Irene Schwartz Foundation, the Rheumatology Research Foundation, the Simons Foundation, and the National Institutes of Health, and support in part by the National Center for Advancing Translational Sciences (NCATS) Clinical Translational Science Award # UL1 TR001866 to the Rockefeller University.

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### **Where can I find more information about this study?**

The results of this study were published on July 16, 2020 in the New England Journal of Medicine and can be found here: <https://www.nejm.org/doi/full/10.1056/NEJMoa2004114>

To learn more about this study, visit <https://clinicaltrials.gov/ct2/show/NCT02051114>.  
For information about research studies at Rockefeller, go to [www.RUCARES.org](http://www.RUCARES.org)

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**Thank you to all who participated.**

Without research participants there can be no clinical research. Our study participants help us understand more about rheumatoid arthritis flares. If you have questions, please contact Dr. Dana Orange at [dorange@rockefeller.edu](mailto:dorange@rockefeller.edu).

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