

Platelets may play key role in development of lupus

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Platelets may play a key role in the development of lupus, according to a study published today by researchers at Université Laval and CHU de Québec-Université Laval Research Center. Extracellular DNA circulating in the blood of patients with lupus causes the inflammatory reaction associated with the disease. The researchers have shown that this DNA comes in part from the platelets, better known for their role in

coagulating blood. The details of the breakthrough have been published today in *Science Translational Medicine* and could lead to a better understanding of the disease and more effective treatment.

"Lupus is an autoimmune disease that causes chronic inflammation of various body parts, particularly the joints, skin, brain, and kidneys," explained lead author Éric Boilard, professor at the Université Laval Faculty of Medicine and researcher at CHU de Québec-Université Laval Research Center. "It strikes 40 people per 100,000, frequently between the ages of 20 and 40, and is nine times more prevalent in women than in men. Lupus presents in a variety of ways and can be difficult to diagnose."

One common denominator of severe forms of the disease is the presence of anti-DNA antibodies in the blood. "When DNA circulates freely in the blood, antigen-antibody complexes form and accumulate in the tissues where the lupus presents. Until now, we didn't know exactly where this [genetic material](#) was coming from," said Professor Boilard, who is also a researcher at the ARThrite research center.

In collaboration with fellow professor and clinical researcher Paul R. Fortin, Boilard's team analyzed [blood samples](#) from 74 patients with lupus and discovered that the platelets were the source of the extracellular DNA. "To be precise, the DNA is present in the [platelet mitochondria](#). Most of the DNA was actually still inside the mitochondria in the [blood](#) we studied. The body produces antibodies against the mitochondria and the mitochondrial DNA because it considers them foreign bodies," explained Professor Boilard.

When the platelets are activated, the mitochondria and their DNA are released. "But this activation does not seem involved in normal platelet functions such as preventing bleeding," said Boilard. "If we can figure out how to interrupt this activation process, we can prevent the

mitochondria and the mitochondrial DNA from being released, which will reduce the autoimmune reaction we see with this disease."

More information: I. Melki et al., "Platelets release mitochondrial antigens in systemic lupus erythematosus," *Science Translational Medicine* (2021). [stm.sciencemag.org/lookup/doi/ ... scitranslmed.aav5928](https://stm.sciencemag.org/lookup/doi/10.1126/scitranslmed.aav5928)

Provided by Laval University

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