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FOR IMMEDIATE RELEASE

“Good Guy” Blood Cells are Now Suspects in Heart Disease, Diabetes
UR Scientists Discover a Whole New Dimension to Platelets

Until recently, the story on platelets was pretty simple: tiny blood cells, with limited sophistication because they had no nucleus, and their claim to fame was to be a first-responder to a wound site, to promote healthy clotting and prevent infection. Later scientists theorized platelets might be connected to harmful chronic inflammation, but the links were unclear.

In a paper published in the prestigious scientific journal *Blood*, a team of University of Rochester researchers opened a new frontier for platelets. They believe the platelet is the pivotal link between inflammation, heart disease and stroke – and may even be a key cell in the body that promotes diabetic complications, the origin of which remains unknown.

Furthermore, the team found that when platelets change from “good guys” to inflammatory villains, they could be doused with a common Type II diabetes drug that was developed to make tissue more insulin sensitive, but acts as an anti-inflammatory agent on platelets. This finding may offer a new way to use anti-diabetic drugs beyond diabetes treatment, or lead to the development of a new generation of drugs that target platelets.

The results came as a laboratory surprise during a broader investigation of platelets and inflammation, led by corresponding author Richard Phipps, Ph.D., University of Rochester Medical Center professor and director of the Lung Biology and Disease Program. Co-authors include Neil Blumberg, M.D., director of the university’s Strong Memorial Hospital Blood Bank and professor of Pathology and Laboratory Medicine; Charles W. Francis, M.D., an authority on vascular disease and a UR professor of Medicine; graduate student Denise Gray, and Filize Akbiyik, M.D., a visiting scientist.

“Our findings totally shift the way we view platelets,” Phipps says. “Normally non-nucleated cells have limited capabilities, but we now believe that platelets are far more complex than was thought.”

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Chronic inflammation is a major concern in medicine. Doctors are trying to understand, for example, why some individuals suffer heart attacks even though they do not have major heart blockages – and inflammation may be the answer. In fact, many chronic cardiovascular diseases suffered by millions of Americans are linked to inflammation, and scientists are rushing to determine which cells are the culprits.

“This new finding has the potential to be a homerun, in the sense that it suggests a new pathway between inflammation and disease,” says Blumberg. “But importantly, it’s a pathway that we know already responds to a licensed drug. To use a spring yard work analogy, it’s like realizing one day that although you’ve been using one tool in your lawn, another one hanging in your garage works can dramatically contribute to the job, even though no one would suspect it.”

Phipps’ lab specializes in investigating the biomarkers for inflammation. In experiments on human platelet samples, they discovered that platelets express PPARg, a transcription factor that was believed to be expressed only by cells with a nucleus. Activation of the PPARg protein by certain anti-diabetic drugs blunts the ability of platelets to release pro-inflammatory mediators and to form clots. Studies are continuing on how PPARg alters platelet function, and the group hopes to launch clinical research to test whether anti-diabetic drugs dampen the inflammatory activity, and can be used to prevent or treat vascular disease.

Funds for the investigation came from the UR; additional grants from the National Institutes of Health are being sought.

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