

PRESS RELEASE

New pathway in immune defense discovered

Bonn researchers decode the interaction of monocytes and platelets in human blood

Bonn, July 08 - Monocytes, a special type of white blood cell, secrete cytokines as inflammatory messengers that are crucial for an appropriate immune response. Researchers at the University Hospital Bonn (UKB) and the University of Bonn have now discovered that platelets, also known as thrombocytes, communicate with monocytes and increase their inflammatory capacity. By understanding the platelet-monocyte interaction, they hope to improve the treatment of immune disorders and associated diseases. The results of the study have now been published in the renowned journal "EMBO Molecular Medicine" and will be featured on the cover of August issue.

Monocytes are white blood cells, known as leukocytes. They are an important part of the innate immune system and contribute to host defense in the blood by secreting large quantities of pro-inflammatory cytokines. Abnormal activity of monocytes leads to hyperinflammation, i.e. very severe inflammation, as well as life-threatening cytokine storms. On the other hand, disturbed monocyte function is associated with "immune paralysis". In this condition, the immune system's ability to fight off invaders such as viruses and bacteria is inhibited. This increases susceptibility to infections. "It is therefore crucial to understand how the functions of monocytes are regulated," says senior and corresponding author Prof. Dr. Bernardo Franklin from the Institute of Innate Immunity at the UKB and the Cluster of Excellence ImmunoSensation² at the University of Bonn, explaining the motivation to investigate the role of platelets in the regulation of monocyte-induced inflammation.

Platelets as a central checkpoint in immune defense

Platelets play a central role in blood clotting, but are also thought to perform important functions in the immune system. Prof. Franklin's research team has already identified platelets as an important regulator of inflammation. They now report that a low platelet count in the rare blood disorder immune thrombocytopenia (ITP) or the artificial removal of platelets from healthy monocytes results in "immunoparalysis". This is characterized by a disturbed cytokine reaction and is an immunological challenge. "Remarkably, supplementing monocytes with fresh platelets reverses this condition and restores the monocyte cytokine response," says corresponding and co-first author Dr. Ibrahim Hawwari, a postdoctoral fellow of the University of Bonn at the Institute of Innate Immunity at the UKB. The Bonn

**Medical Director and
Chairman of the Board**

Tel: +49 228 287-10900
Fax: +49 228 287-9010900
wolfgang.holzgreve@ukbonn.de

Communication and media

Viola Röser
Management

Tel: +49 228 287-10469
viola.roeser@ukbonn.de

Bonn University Hospital
Communication and media
Venusberg Campus 1
Geb. 02
53127 Bonn

researchers discovered that the pro-inflammatory signals, including NF- κ B and p38 MAPK, propagate from platelets to monocytes and maintain their inflammatory capacity. "Platelet vesicles as an extended arm of platelets control this intercellular communication," says co-first author Lukas Roßnagel, PhD student of the University of Bonn at the Institute of Innate Immunity of the UKB.

The results of the study point to a new intercellular communication mechanism in which platelets regulate monocyte function. "Clinically, this suggests potential therapeutic strategies to counteract monocyte immune paralysis in conditions such as ITP and other inflammatory diseases with the addition of platelets," says Prof. Franklin, who hopes that an understanding of platelet-monocyte interactions will lead to improved treatment of immune disorders and related diseases.

Publication: Ibrahim Hawwari, Lukas Rosnagel et al: Platelet transcription factors license the pro-inflammatory cytokine response of human monocytes; EMBO Molecular Medicine, DOI: <https://doi.org/10.1038/s44321-024-00093-3>

Scientific contact:

Prof. Dr. Bernardo S. Franklin

Institute for Innate Immunity

Bonn University Hospital

Cluster of Excellence ImmunoSensation², University of Bonn

Phone +49 228 28751981

E-mail: franklin@uni-bonn.de

Dr. Ibrahim Hawwari

Institute for Innate Immunity

Bonn University Hospital

Phone: +49 (228) 287 51202

E-mail: ihawwari@uni-bonn.de

Image material:



Caption: (from left) Dr. Ibrahim Hawwari, Prof. Bernardo Franklin and Lukas Roßnagel discover new intercellular communication mechanism in which blood platelets, so-called thrombocytes, regulate the function of monocytes.

Picture credits: University Hospital Bonn / Alessandro Winkler

Press contact:

Dr. Inka Väth

Deputy Press Officer at the University Hospital Bonn (UKB)

Communications and Media Office at Bonn University Hospital

Phone: (+49) 228 287-10596

E-mail: inka.vaeth@ukbonn.de

About Bonn University Hospital: The UKB treats around 500,000 patients per year, employs around 9,500 staff and has total assets of 1.8 billion euros. In addition to the 3,500 medical and dental students, 550 people are trained in numerous healthcare professions each year. The UKB is ranked first among university hospitals in NRW in the Focus Clinic List and has the second-highest case mix index (case severity) in Germany. In 2022 and 2023, the F.A.Z. Institute recognized the UKB as Germany's most desirable employer and training champion among public hospitals in Germany.