

PRESS RELEASE

New insights into our immune system

Bcl6 important for the formation of certain dendritic cells

Bonn 30 April 2024 – Dendritic cells play an important role in setting the course of our immune system. However, what determines their heterogeneity and functional specialization is still not sufficiently understood. An international collaboration consisting of researchers from the University Hospital Bonn (UKB), the University of Bonn and the Technical University of Denmark, among others, has investigated the role of the transcription factor Bcl6 in dendritic cells in a mouse model and discovered that a subgroup is highly dependent on this protein. The findings contribute to a better understanding of immunological processes during infections, vaccinations, allergies and autoimmunity. The results have now been published in the renowned scientific journal "Nature Communications".

Dendritic cells are part of our innate immune system and occupy a central position there. "These cells are particularly good at initiating an effective T-cell-mediated immune response of the acquired immune system," explains co-corresponding author Prof Dirk Baumjohann from the Medical Clinic III for Hematology, Oncology, Immuno-Oncology and Rheumatology at the UKB, who is a member of the Cluster of Excellence ImmunoSensation² and the Transdisciplinary Research Area (TRA) "Life & Health" at the University of Bonn. "However, it is still unclear what exactly drives their heterogeneity and functional specialization."

Previous studies have investigated the function of the protein Bcl6 in dendritic cells - in some cases with varying results. The aim of the current study is to harmonize the sometimes contradictory data using an in-depth analysis.

Bcl6 as an important transcription factor

The researchers therefore used a mouse model to investigate how the absence of Bcl6 affects all dendritic cell subgroups. "We found that in particular one specific dendritic cell subgroup (cDC2) is highly dependent on Bcl6," explains Prof Katharina Lahl, who led the project at the Technical University of Denmark and is now continuing her work in Calgary. "Bcl6 deficiency leads to a lack of a dendritic cell subpopulation and results in impaired antibody responses in the spleen." As a result, the animals showed weakened immune responses in infection and vaccination models. "Bcl6 deficiency also led to the loss of the cDC2

Medical Director and Chairman of the Board

Prof. Dr. Dr. h. c. mult.
Wolfgang Holzgreve, MBA

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

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

subgroup in the large intestine, which caused a delayed recovery from an intestinal infection," adds Prof Lahl.

In addition, the researchers were able to demonstrate with their study that the gene expression program in dendritic cells is already decisive for the subsequent cell fate of T cells and the associated immune response.

"The function of Bcl6 in dendritic cells overlaps with the already known function of Bcl6 in T cells and B cells and thus complements a gene expression program that acts synergistically across different immune cells," says Prof. Baumjohann. "These findings can contribute to the development of new therapeutic strategies, for example by strengthening specific dendritic cells during infection or vaccination or weakening them in allergies and autoimmune diseases."

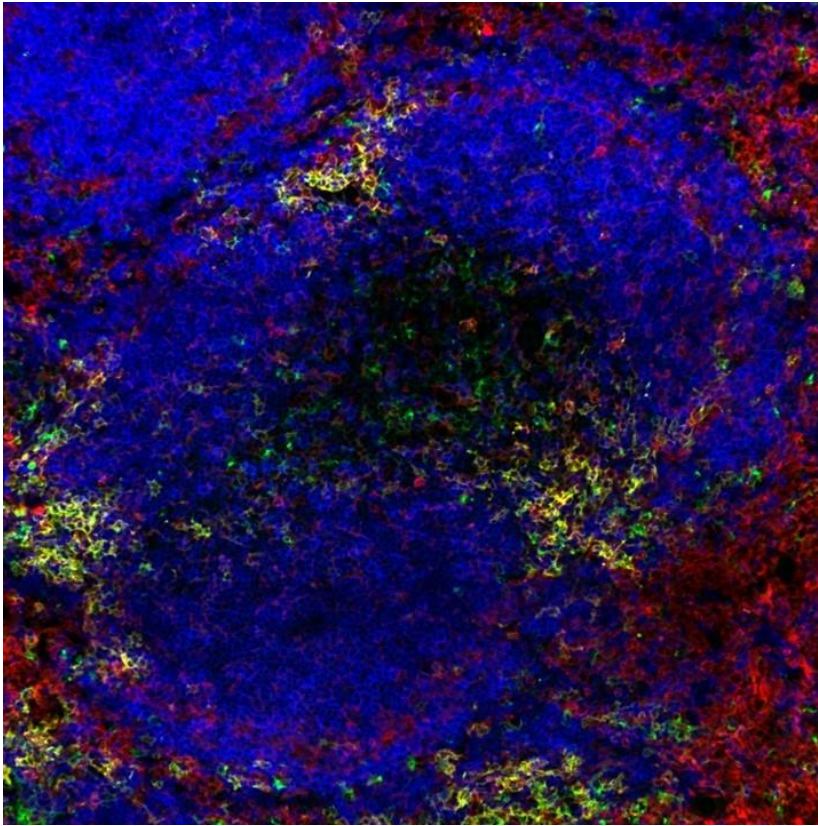
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Scientific contact:

Prof Dr Dirk Baumjohann
Medical Clinic III for Haematology, Oncology, Immuno-oncology and Rheumatology
University Hospital Bonn
Cluster of Excellence ImmunoSensation2 & TRA "Life & Health", University of Bonn
Telephone: 49 (0)228 287 51185
E-mail: dirk.baumjohann@uni-bonn.de

Prof Dr Katharina Lahl
Department for Immunology, Microbiology and Infectious Diseases
Snyder Institute for Chronic Diseases
Cumming School of Medicine
Calgary, AB, Canada
E-mail: katharina.lahl@ucalgary.ca

Visuals:



Caption:

Image of a murine white pulp of the spleen, in which large amounts of B cells (B220, blue) and dendritic cells (CD11c, green) can be found. The red pulp is highlighted by myeloid cell staining (SIRP α , red).

Picture credits: Technische Universität Dänemark (DTU) / Urs Michael Mörbe

Press contact:

Jana Schäfer

Deputy Press Officer at the University Hospital Bonn (UKB)
Communications and Media Office at Bonn University Hospital

Phone: +49 228 287-19891

E-mail: jana.schaefer2@ukbonn.de

About the University Hospital Bonn: The UKB treats around 500,000 patients per year, employs around 9,000 staff and has total assets of 1.6 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 (UK) in NRW in the science ranking and in the Focus clinic list and has the third highest case mix index (case severity) in Germany. In 2022 and 2023, the F.A.Z. Institute recognized the UKB as the most desirable employer and training champion among public hospitals in Germany.