New protein found in immune cells

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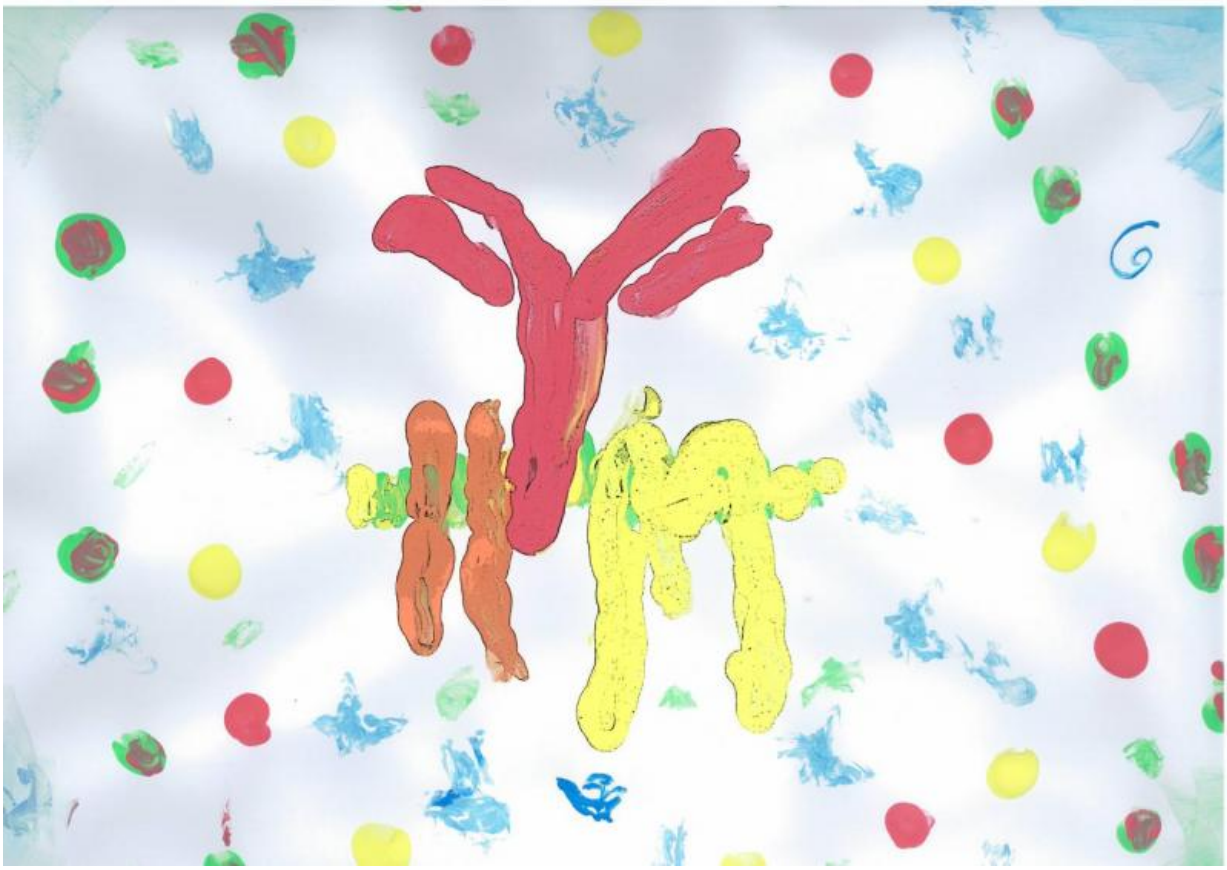

Artwork painted by the daughter of researcher Susana Minguet. The protein Kidins220 (yellow) interacts with the B cell receptor (red and orange). Credit: Susana Minguet

Researchers of the University of Freiburg have discovered Kidins220/ARMS in B cells. They also determined that it plays a

decisive role in the production of antibodies and the formation of B cells, which are a type of white blood cells. Various teams of researchers had already found that Kidins220/ARMS is present in nerve cells and in T cells of the immune system. However, that it is present in B cells was unknown until now.

"We've discovered a new molecular player in the immune system," said the immunobiologist Prof. Dr. Wolfgang Schamel, adding, "This knowledge could help to develop new medications for autoimmune diseases or other illnesses in the future." The postdoc Dr. Gina J. Fiala from Schamel's lab is the lead author of the group's publication in the *Journal of Experimental Medicine*. Fiala studied Kidins220/ARMS in B cells for her doctoral thesis. Several other members of the cluster of excellence BIOSS Centre for Biological Signalling Studies also collaborated in this study.

B lymphocytes, also known as B cells, are the only cells to produce antibodies, which the immune system needs to fight off foreign intruders like pathogens in order to protect the human body. On their surface, B cells carry B cell receptors. These activate the B cells when an antigen - a substance on the surface of a pathogenic germ - binds to them. The team of scientists from the University of Freiburg has discovered that Kidins220/ARMS interacts with the B cell receptor and affects signalling pathways from the receptor to the interior of the cell. Without Kidins220/ARMS, the receptor's ability to send signals is limited. As a result, the B cells manufacture less antibodies and the immune system is weakened.

Kidins220/ARMS is also vital for the formation of B cells. If a mouse cannot produce this protein, the B lymphocytes develop in a way that makes them less functional than the B cells of a healthy immune system. The reason for this is that B cells depend on the signals from the B cell receptor and pre-B cell receptor, which is the early version of a B cell

receptor, at various stages of their development. Deficiency in Kidins220/ARMS therefore obstructs the development of B cells.

Gina J. Fiala and Wolfgang Schamel are researchers at the Institute of Biology III at the University of Freiburg. Other members of the team from the University of Freiburg include Dr. Tilman Brummer from the Institute of Molecular Medicine and Cell Research, Prof. Dr. Jörn Dengjel from the Center for Biological Systems Analysis, as well as Dr. Susana Minguet and Prof. Dr. Michael Reth, both from the Institute of Biology III. Brummer, Dengjel, Minguet and Schamel are also members of the BIOSS Centre for Biological Signalling Studies. Reth is the scientific director and speaker of BIOSS Centre for Biological Signalling Studies. Fiala has written her doctoral thesis as a PhD student at the Spemann Graduate School of Biology and Medicine of the University of Freiburg.

More information: Kidins220/ARMS binds to the B cell antigen receptor and regulates B cell development and activation (2015). Gina J. Fiala, Iga Janowska, Fabiola Prutek, Elias Hobeika, Annyesha Satapathy, Adrian Sprenger, Thomas Plum, Maximilian Seidl, Jörn Dengjel, Michael Reth, Fabrizia Cesca, Tilman Brummer, Susana Minguet, and Wolfgang W.A. Schamel. The *Journal of Experimental Medicine* 212 (10). DOI: 10.1084/jem.2014127

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