

# A newly discovered mechanism controls the number of immune cells

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The proteins CD47 and SIRP $\alpha$  are fundamental to establishing a correct number of immune cells, so-called B lymphocytes. This according to a dissertation by Shrikant Shantilal Kolan from Umeå University in Sweden.

"The findings in the present dissertation have uncovered new mechanisms that regulate cells of the immune system, more precisely the B [lymphocytes](#). Such knowledge may be important in development of future strategies to either improve or dampen the amount of [immune cells](#) in the body," says Shrikant Shantilal Kolan, postgraduate student at the Department of Integrative Medical Biology at Umeå University.

B lymphocytes are one type of [white blood cells](#) that is fundamental for the immune system to defend off attacking bacteria or viruses. B lymphocyte development from stem cells begins in the [bone marrow](#) and ends with the generation of mature B lymphocytes in the spleen or in the bone marrow itself. In the human body, B lymphocytes are maintained in large numbers – around 100 billion. However, defects in the development of B lymphocytes, or in their function, may lead to blood cancers or immune-deficiencies.

Shrikant Shantilal Kolan has in his dissertation investigated new mechanisms involved in regulating B lymphocyte development and maturation. The dissertation shows that two [cell surface proteins](#), CD47 and SIRP $\alpha$ , are each important to develop normal numbers of B lymphocytes. Although the exact details remain to be understood, these

two proteins may be important to prevent death of developing B lymphocytes and to promote the long-term survival of the vast majority of all B lymphocytes.

The proteins CD47 and SIRP $\alpha$  were also found to have the opposite effect on a smaller subset of B lymphocytes, the so called marginal zone (MZ) B lymphocytes of the spleen. For this B lymphocyte subset, CD47 and SIRP $\alpha$  were found to be required to prevent an abnormal accumulation of these cells with an increasing age.

"The effects of CD47 and SIRP $\alpha$  in regulating B lymphocyte development was found to be complex and require further studies. The presence and function of the proteins in either immune cells or non-immune cells was found to affect this process differently," says Shrikant Shantilal Kolan.

**More information:** [umu.diva-portal.org/smash/record.jsf?pid=diva2%3A848526&dswid=-7926](http://umu.diva-portal.org/smash/record.jsf?pid=diva2%3A848526&dswid=-7926)

Provided by Umea University

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