New findings on B cells may improve vaccine design
14 September 2021

In a new study, researchers at Karolinska Institutet have studied the generation of B cells early after infection and vaccination in animal models. They found that B cells early on make cell fate decisions that have consequences for the balance between the effector and memory response.

"We show that there is an extensive early wave of memory cells that seems to be a 'default' fate for many activated B cells, and that these early memory cells seem to be equally long-lived as the traditional late wave of memory cells," says Taras Kreslavsky, assistant professor at the Department of Medicine, Solna, Karolinska Institutet, who led the study. "The early memory cells are kept as a reserve and can rapidly be re-activated and transformed into effector B cells if the threat increases. This way, our bodies can fine-tune the antibody response proportionally to the threat level."

Could improve vaccine design

The research team also shows that the early memory response is evolutionarily conserved, which opens the possibility of influencing the B cell response in humans through vaccination.

"We believe that rational vaccine design may enable manipulation of the type of B cells that are formed and thus make the body's defense more effective," says the study's first author, Vassilis Glaros, a doctoral student in Taras Kreslavsky's research team.

The researchers plan to further study how the early B cell response can be modulated and the consequences of skewing the response between effector and memory cell fates.

Crucial to our body's defense

"The memory B cells are crucial to our body's defense against evolving pathogens, such as
SARS-CoV-2 virus variants which cause COVID-19," says co-author Sebastian Ols, a doctoral student in Karin Loré's research group at the Department of Medicine, Solna, Karolinska Institutet. "Our memory cells are better equipped at adapting and parrying new variants than our effector cells are, and it is therefore critical for vaccines to elicit diverse memory B cell responses."


Provided by Karolinska Institutet


*This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.*