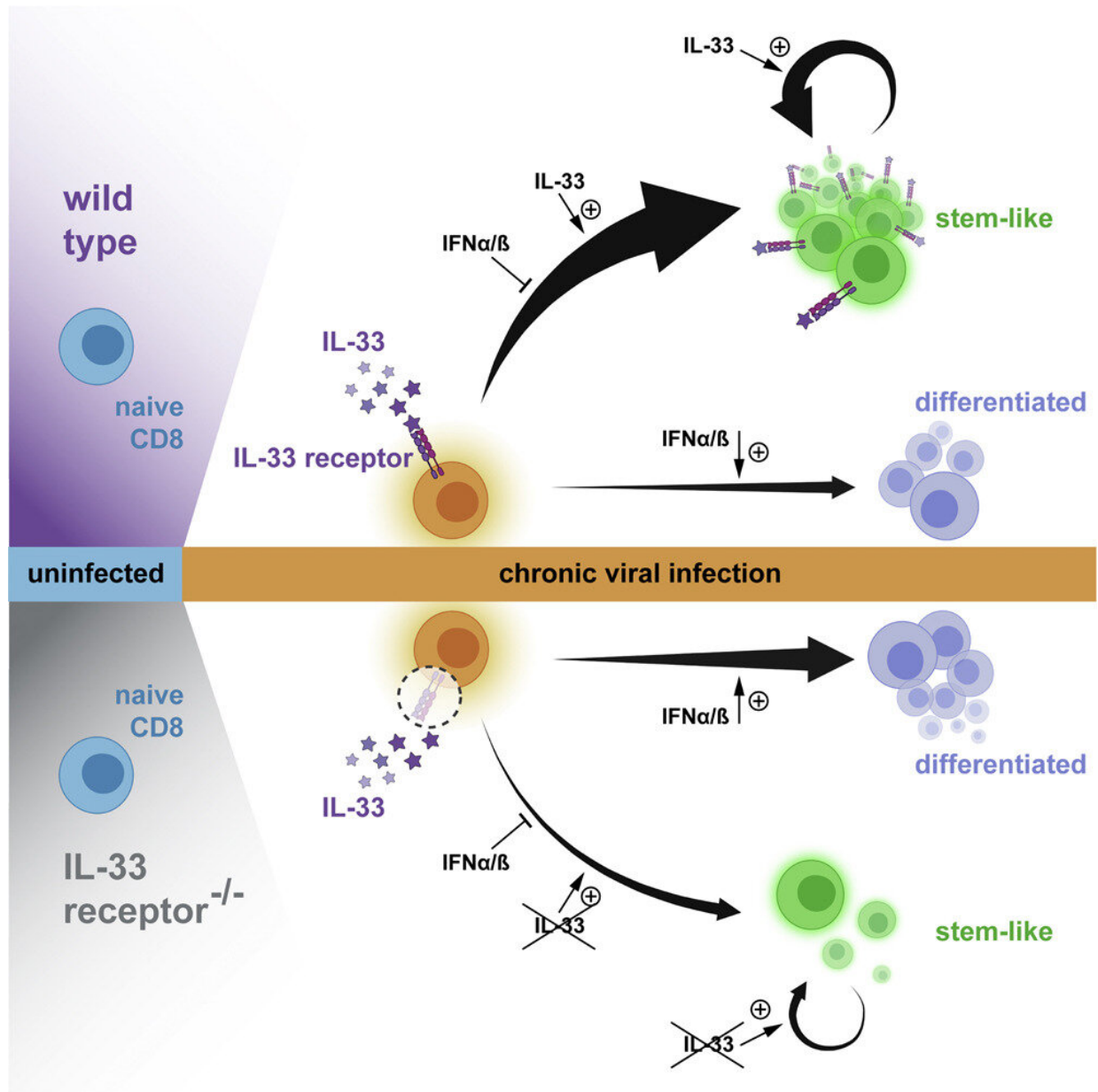


How IL-33 plays a key role in enabling the marathon runners of the immune system

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Graphical abstract. Credit: *Immunity* (2023). DOI: 10.1016/j.immuni.2023.01.029

When it comes to chronic infections and cancer, a particular type of immune cell plays a central role in our defenses. Researchers at the University of Basel have uncovered the key to the tenacity of these immune cells in coping with the marathon that is fighting a chronic infection. Their results lay the foundations for more effective therapies and vaccination strategies.

Infected and [abnormal cells](#) have to go, and as quickly as possible, before any more damage is done. This is the task of what are known as cytotoxic T cells. The question of how these cells fight off chronic [infection](#) is under investigation by the team surrounding Professor Daniel Pinschewer at the Department of Biomedicine of the University of Basel, in collaboration with several national and international partners.

"These T cells can become specialized in two different ways: either as a kind of sprinter or as marathon runners," explains Pinschewer.

"However, the latter can also convert into sprinters at any time, in order to stamp out an infection."

Chronic infections are a special case: The T cells are activated and a strong inflammatory response occurs at the same time. "This tends to 'shock' the T cells into developing into sprinters, which can only intervene effectively in the short term to remove infected cells," says the virologist. "If all T cells behaved like that, our immune defenses would break down pretty soon."

In their study published in the journal *Immunity*, the researchers

examined how, in spite of this, the [immune system](#) is still able to provide enough T cells for the endurance race against [chronic infections](#).

According to their results, a biological messenger called interleukin-33 (IL-33) plays a key role. It allows the T cells to remain in their "marathon runner" state.

"IL-33 takes away the shock of the inflammation, so to speak," explains Dr. Anna-Friederike Marx, lead author of the study.

In addition, the biological messenger causes the marathon T cells to proliferate, so that more endurance runners are available to combat the infection. "Thanks to IL-33, there are enough cytotoxic T cells around for the long haul that can still pull off a final sprint after their [marathon](#)," says Marx.

The findings could help improve the treatment of chronic infections such as hepatitis C. It is conceivable that IL-33 could be administered to support an effective immune response. Thinking along the same lines, IL-33 could be one key to improving cancer immunotherapy, to enable T cells to wage an efficient and long-lasting offensive against tumor cells.

More information: Anna-Friederike Marx et al, The alarmin interleukin-33 promotes the expansion and preserves the stemness of Tcf-1+ CD8+ T cells in chronic viral infection, *Immunity* (2023). [DOI: 10.1016/j.immuni.2023.01.029](https://doi.org/10.1016/j.immuni.2023.01.029)

Provided by University of Basel

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