

# **Rejuvenating the Immune System through Depletion of Myeloid-Biased Hematopoietic Stem Cells**

There are two subsets of Hematopoietic stem cells (HSC); one subset that provides balanced production of myeloid and lymphoid cells, and another that is biased toward production of the myeloid lineage. Aging is associated with a transition to mainly myeloid biased HSC which leads to a variety of issues including poor T and B cell responses to new pathogens, chronic inflammation, increased hematopoietic diseases, increased incidence of cancer due to loss of adaptive T and B cell responses. To address this issue, Stanford researchers have discovered several cell surface markers expressed on the myeloid biased subset, but not the balanced subset of HSCs. Researchers have shown that antibodies to these markers deplete myeloid biased HSCs in mouse models and in turn showed increased production of common lymphocyte progenitors. The targeted my-HSC antigens identified in this study are also enriched in aged human HSCs, nominating them as therapeutic targets to rejuvenate the immune system in humans.

## **Stage of Development**

Proof of concept: completed successful demonstration in vivo in mouse models

## **Applications**

- Counteract immune decline: elderly, immunocompromised, cancer, chronic disease individuals
- Hematopoietic diseases
- Age related inflammation

## Advantages

- First method focused on enhancing the function of hematopoietic stem cells to enhance the immune system

## Publications

- Ross, J.B., Myers, L.M., Noh, J.J. et al. (2024). [Depleting myeloid-biased haematopoietic stem cells rejuvenates aged immunity](#). *Nature*.

## Innovators

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