simply blood
Deconstructing Blood Cell Research
Building the Hematology Community

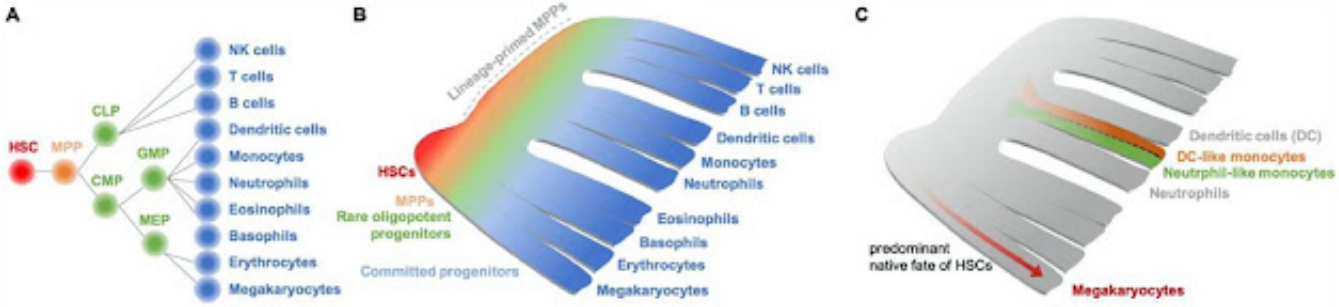
Exploring Experimental Hematology: August 2020 (Volume 88)

- September 03, 2020

In this issue of Simply Blood, we are highlighting and deconstructing an invited perspective from the latest Experimental Hematology, "Lineage commitment of hematopoietic stem cells and progenitors: insights from recent single-cell and lineage tracing technologies" by Loughran et al. This perspective summarizes the Summer 2019 ISEH New Investigator Committee Webinar, "Changing concepts in lineage commitment" and update the recent progress of understanding lineage commitment using lineage tracing combined with single-cell transcriptomics and proteomics. (Loughran et al., 2020)

My reason to read this paper:

The self-renewal and multilineage differentiation abilities are two essential characteristics of hematopoietic stem cells (HSCs). In the history of the hematopoietic field, to understand the cell fate determination and lineage potential from each HSC and progenitor population, people have taken various strategies including colony-forming assays, stromal co-culture, thymic organ cultures, and transplantation assays. These studies established the current concept of hematopoiesis, described as a lineage tree, in which HSC sits on the top of the hierarchy and is branching into lymphoid and myeloid lineages. However, it has been recognized that the differentiation into each blood lineage is not that simple. Recent single-cell technologies resolve the controversies of HSPC differentiation potential and molecularly confirm the ideas that have been proposed but yet to be evident. This perspective concisely reviews a portion of recent updates.



(A) Classic hematopoietic tree mode. (B) HSC differentiation occurs through phenotypically defined progenitor populations with heterogenous lineage potential. (C) Lineage tracing, combined with single-cell analysis, suggests that Megakaryopoiesis is the predominant fate of HSCs in native hematopoiesis and that multiple lineage trajectories generate equivalent mature hematopoietic cell types.

The reason you should read this paper:

1. Hematopoiesis has a long history. If you are a new trainee in the field, it is indispensable to understand the concept of the hematopoietic system. This perspective introduces how the concept is currently changing by recent single-cell technologies. In 2020, there are more papers published regarding single-cell tracing, HSC self-renewal, and fate determination. Reading this manuscript would be a good starting point for you to go back to the historical reviews and to capture this transition.

2. This perspective is a summary of the Summer 2019 ISEH New Investigator Committee Webinar, "Changing concepts in lineage commitment." One of the good reasons to become an ISEH member is that such useful webinars are available for free! Be a member today!

Momoko Yoshimoto MD., PhD
Associate Professor
Center for Stem Cell and Regenerative Medicine,
Institute of Molecular Medicine,
University of Texas Health Science Center at Houston

Experimental Hematology ISEH Research

Enter Comment

Popular posts from this blog

ISEH 2025 Society Award Winners

- *March 11, 2025*

On behalf of the Awards Committee, ISEH would like to congratulate the recipients of the 2025 ISEH Society Awards which will be presented at the ISEH 54th Annual Scientific Meeting . Donald Metcalf Award Winner - Constanze Bonifer The recipient of the 2025 Donald Metcalf Award is Dr. Constanze ...

READ MORE

Message from the President: 2021 Society Updates

- *March 25, 2021*

Dear Friends and Colleagues, I write this message reflecting upon what was an unprecedented time for hematology and hematology researchers. Looking back on last year, I am truly amazed by how our ...

READ MORE

Lab Spotlight: Vanuytsel Lab

- *November 14, 2024*

Each month, Simply Blood spotlights a lab contributing to the fields of hematology, immunology, stem cell research, cell and gene therapies, and more. Get to know groups doing cutting edge research from around the world! This month, we are featuring the Vanuytsel Lab which is based out of the Center for …

READ MORE