ME6

How do we utilize single-cell RNA seq for GVHD research ?

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Aim/Introduction:
In these decades, cellular immune research for GVHD pathophysiology using the mouse BMT model has contribute to the understanding of this important complication after allogeneic HSCT. Recent advances in technology have led to the further elucidation of GVHD mechanisms through the comprehensive gene expression analysis by using human clinical samples. In this "Meet-the-expert" session, we would like to discuss various perspectives on how to utilize single-cell RNA seq for GVHD research.

Expert

Name/title: Assoc. Prof. Dr. Georg Stary
Affiliations: Medical University of Vienna, Department of Dermatology; Ludwig Boltzmann Institute for Rare and Undiagnosed Diseases; CeMM – Research Center for Molecular Medicine of the Austrian Academy of Sciences

Brief self-introduction:
My research projects focus on the contribution of tissue-resident leukocytes to physiological and pathological immune responses in health and diseases. We are interested in various areas of cellular biology, immune cell longevity, turn-over and function of tissue-resident leukocytes in barrier organs and the development of in vitro models mimicking processes in human organs. The skin often serves as model tissue being accessible for translational experimental setups.

Related publications:
1)Processing human skin samples for single-cell assays. *STAR Protoc* 3:101470. doi: 10.1016/j.xpro. 2022. 101470, 2022.
2)Human resident memory T cells exit the skin and mediate systemic Th2-driven inflammation. *J Exp Med* 218:e20210417. doi: 10.1084/jem. 20210417, 2021.
3)Long-term skin-resident memory T cells proliferate in situ and are involved in human graft-versus-host disease. *Sci Transl Med* 12(570): eabb7028. doi: 10. 1126/scitranslmed. abb7028, 2020.

Facilitator

Name/title:
Ken-ichi Matsuoka M.D., Ph.D.
Affiliation:
Department of Hematology and Oncology, Okayama University, Okayama, Japan

Brief self-introduction:
The research aim in our lab is to understand the whole mechanistic landscape of GVHD and GVL after allogeneic HSCT in the clinical setting. In particular, Tregs play a pivotal role in inducing transplant tolerance with maintaining the GVL activity, and thus our studies have attempted to define the intrinsic and extrinsic factors affecting Treg-homeostasis from the acute to chronic phases after HSCT.

Related publications:
1)PTCy ameliorates GVHD by restoring regulatory and effector T-cell homeostasis in recipients with PD-1 blockade. *Blood Adv*. 2019 Dec 10; 3(23): 4081-4094.
2)PD-1 modulates regulatory T-cell homeostasis during low-dose interleukin-2 therapy *Blood*. 2017 Apr 13; 129(15): 2186-2197.
3)Low-dose interleukin-2 therapy restores regulatory T cell homeostasis in patients with chronic graft-versus-host disease, *Sci Transl Med*. 2013 Apr 3; 5(179): 179ra43.