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Stories of Single Cells: Mapping the Geography of Acute Leukemia and its Micro-Environment

Date: Tuesday, 17 September 2019

Time: 10.00am – 11.00am

Venue: Auditorium, Clinical Research Centre (MD11)
(10 Medical Drive, Singapore 117597)

Host: Dr Takaomi Sanda

Abstract:

The bone marrow (BM) microenvironment comprises a network of cellular and molecular interactions involving a vast array of different cell types including immune cells, bone-forming osteoblasts, mesenchymal stromal cells, and vascular endothelial cells, to mention just a few. Considering the importance of the bone marrow in normal hematopoiesis and the initiation and progression of leukemia, it is surprising that we know very little about its cellular identity and the complexity of interactions between distinct cell types. We have previously mapped using single cell RNA-Sequencing the bone marrow stroma (Tikhonova *et al. Nature*, 2019) and suggested micro-environmental therapeutic targets in T cell acute lymphoblastic leukemia (Pitt, Tikhonova *et al. Cancer Cell*, 2015). We are currently focusing on the human bone marrow immune microenvironment in distinct types of acute leukemia, and use single cell transcriptomics approaches to identify immune populations that are important in disease progression and response to treatment. Using animal models of acute leukemia, we prove that single cell mapping of the tumor micro-environment is able to suggest novel and exciting targeted therapy targets that can lead to improved treatment responses in aggressive hematologic malignancies.

Biosketch:

Dr. Iannis Aifantis is the Hermann M. Biggs Professor and the Chair of the Department of Pathology at the NYU School of Medicine. He is also a member of the NYU Perlmutter Cancer Center. He has completed his B.Sc. (Molecular Biology) and M.Sc. (Genetics, Immunology) at the University of Crete in Greece. He obtained his Ph.D. from the University of Paris V (Institut Necker) in France and completed a post-doctoral training in Immunology and Hematology at the Dana-Farber Cancer Institute (Harvard Medical School) both under the supervision of Dr. Harald von Boehmer. He became an Assistant Professor in Medicine at the University of Chicago and moved to NYU School of Medicine in 2006. He has been a member of the Howard Hughes Medical Institute (HHMI) as an early career investigator (2009-2015). His laboratory focuses on mechanisms of differentiation and transformation of hematopoietic stem cells and progenitors. More specifically, it focuses on the molecular mechanisms of both lymphoid and myeloid malignancy induction and maintenance. His work has identified and studied novel oncogenes, tumor suppressors and downstream oncogenic signaling pathways. The Aifantis lab is using these pathways to design molecularly targeted therapeutic protocols that influence disease progression and drug resistance. More recently, the lab has focused on the epigenetic regulation of leukemia, with focus on DNA methylation and the impact of the leukemia microenvironment on disease initiation and progression. For this work, Dr. Aifantis has been the recipient of multiple awards including the Vilcek Award for Creative Promise, the Cancer Research Institute Fred W. Alt Award for New Discoveries in Immunology and the McCulloch and Till Award by the International Society for Hematology and Stem Cell Biology.