RESEARCH TOPIC DASMEN6

Phenotypic and molecular characterization of innate lymphoid cells in Myelodisplastic syndromes: towards the comprehension of their role in disease etiology and prognosis

Curriculum DASMEN Standard

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Abstract
Myelodysplastic syndromes (MDS) are a heterogeneous group of hematologic neoplasms, resulting from a variety of genetic, epigenetic and immunologic factors, and characterized by a variable risk of progression to acute myeloid leukemia (AML). Diagnosis of MDS is challenging, since the pathogenetic mechanism is still unknown, and patient risk stratification is mainly based on aspecific clinical parameters. Hence the characterization of biological mechanisms involved in MDS pathogenesis and prognosis is key to improve MDS management. Given these premises, we aim at disclosing the role of innate lymphoid cells (ILCs) in the development of a tolerant immune environment in MDS, that may contribute to increase genomic instability and to speed evolution to AML. To this end, we will undertake a multi-omic approach investigating the immune and cytokine profile of MDS in combination with its transcriptomic and genomic signature.

Main technical approaches

- High dimensional flow cytometry
- Single cell transcriptomic
- Skill to develop computational methods for the analysis of big data generated from these techniques
- handling of clinical and experimental datasets

Scientific references

- Calvi M, Di Vito C, Frigo A, Trabanelli S, Jandus C, **Mavilio D**. *Development of Human ILCs and Impact of Unconventional Cytotoxic Subsets in the Pathophysiology of Inflammatory Diseases and Cancer*. Front Immunol. 2022 May 26;13:914266. doi: 10.3389/fimmu.2022.914266. PMID: 35720280; PMCID: PMC9204637.

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- Roberto A, Di Vito C, Zaghi E, Mazza EMC, Capucetti A, Calvi M, Tentorio P, Zanon V, Sarina B, Mariotti J, Bramanti S, Tenedini E, Tagliafico E, Bicciato S, Santoro A, Roederer M, Marcenaro E, Castagna L, Lugli E, **Mavilio D**. *The early expansion of anergic NKG2A^{pos}/CD56^{dim}/CD16^{neg} natural killer represents a therapeutic target in haploidentical hematopoietic stem cell transplantation.* Haematologica. 2018 Aug;103(8):1390-1402. doi: 10.3324/haematol.2017.186619. Epub 2018 Apr 26. PMID: 29700172; PMCID: PMC6068034.

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