

RESEARCH TOPIC MEM6

Rewiring granulopoiesis to promote differentiation of antitumoral neutrophils Curriculum MEM

Laboratory name

Chemokine biology
University Campus, Bldg C

Pre-clinical Supervisor

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Abstract

Neutrophil presence in tumor tissue, and high neutrophilia, have been associated with poor prognosis in different oncological contexts (1). However, recent studies have revealed that epigenetic, and metabolic changes of hematopoietic progenitors can induce neutrophil reprogramming toward an anti-tumor phenotype (2). The atypical chemokine receptor ACKR2 is a negative regulator of neutrophil differentiation (3) and our preliminary results indicate that its inhibition induces epigenetic modifications that promote antitumoral granulopoiesis.

Main technical approaches

The main techniques that will be used for the project will be: cell culture, FACS analysis, murine models of tumors.

Scientific references

1. Jalon S, Ponzetta A, Di Mitri D, Santoni A, Bonecchi R, Mantovani A. Neutrophil diversity and plasticity in tumour progression and therapy. *Nat Rev Cancer.* 2020 Sep;20(9):485-503.
2. Kalafati L, Kourtzelis I, Schulte-Schrepping J, Li X, Hatzioannou A, Grinenko T, Hagag E, Sinha A, Has C, Dietz S, de Jesus Domingues AM, Nati M, Sormendi S, Neuwirth A, Chatzigeorgiou A, Ziogas A, Lesche M, Dahl A, Henry I, Subramanian P, Wielockx B, Murray P, Mirtschink P, Chung KJ, Schultze JL, Netea MG, Hajishengallis G, Verginis P, Mitroulis I, Chavakis T. Innate Immune Training of Granulopoiesis Promotes Anti-tumor Activity. *Cell.* 2020 Oct 29;183(3):771-785.e12.
3. Massara M, Bonavita O, Savino B, Caronni N, Mollica Poeta V, Sironi M, Setten E, Recordati C, Crisafulli L, Ficara F, Mantovani A, Locati M, Bonecchi R. ACKR2 in hematopoietic precursors as a checkpoint of neutrophil release and anti-metastatic activity. *Nat Commun.* 2018 Feb 14;9(1):676.



Type of contract

PhD scholarship of € 18.000 gross per year awarded by Humanitas University. This sum is exempt from IRPEF income tax according to the provisions of art. 4 of Law no. 476 of 13th August 1984, and is subject to social security contributions according to the provisions of art. 2, section 26 and subsequent sections, of Law no. 335 of 8th August 1995 and subsequent modifications.

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