



RESEARCH TOPIC MECM3
Role of IL-1R2 in myeloid cells in cancer
Curriculum MECM standard

Research Area

Immunology

Laboratory name

Laboratory of Experimental Immunopathology

Research Supervisor

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Abstract

Cancer related inflammation (CRI) contributes to tumor development.

Interleukin-1 is a primary inflammatory cytokine contributing to CRI, but also part of effective anti-tumor immunity.

The IL-1 system is highly regulated by regulatory receptors. Among these, IL-1R2, the IL-1 decoy receptor, is highly expressed by myeloid cells.

We hypothesise that IL-1R2 may be developed as immunotherapy targets and biomarker of leukocyte dysfunction in cancer.

The PhD student will investigate:

-the effect of IL-1R2-deficiency on myeloid cells in tumor bearing mice.

-the role of IL-1R2 in cancer-emergency granulopoiesis.

-IL-1R2 expression in human myeloid cells in cancer as marker of immunosuppression.

Immunotherapy has revolutionized anticancer therapeutic approaches in most type of cancer. However, a substantial proportion of patients do not show remission in response to immunotherapy. Dissection of immunosuppressive circuits is essential to increase immunotherapy efficacy.

Main technical approaches

Basic knowledge of immunology and preclinical studies in vitro and in vivo.

Scientific references

1- Garlanda C, Mantovani A. Interleukin-1 in tumor progression, therapy, and prevention. *Cancer Cell*. 2021 Aug 9;39(8):1023-1027. doi: 10.1016/j.ccell.2021.04.011

2- Molgora, M., Bonavita, E., Ponzetta, A., (...), Garlanda, C., Mantovani, A. IL-1R8 is a checkpoint in NK cells regulating anti-tumour and anti-viral activity. *Nature* 2017 551: 110-114



3- Jaillon 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;20:485-503. 10.1038/s41568-020-0281-y

4- Magrini E, et al. Complement activation promoted by the lectin pathway mediates C3aR-dependent sarcoma progression and immunosuppression. *Nat Cancer* 2021;2:218-32. 10.1038/s43018-021-00173-0

5- Mantovani A, Dinarello CA, Molgora M, Garlanda C. Interleukin-1 and Related Cytokines in the Regulation of Inflammation and Immunity. *Immunity* 2019;50:778-95. 10.1016/j.immuni.2019.03.012

Type of contract

PhD scholarship of € 21.000 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.

Borsa di dottorato pari a € 21.000 annui lordi erogata da Humanitas University. Importo non soggetto a tassazione IRPEF a norma dell'art. 4 della L. 13 agosto 1984 n. 476 e soggetto, in materia previdenziale, alle norme di cui all'art. 2, commi 26 e segg., della L. 8 agosto 1995, n. 335 e successive modificazioni.