**RESEARCH TOPIC MEM10**

# To evaluate the role of innate immunity in tumor immunoediting and in response to cancer immunotherapies

**Curriculum MEM Standard**

**Laboratory name**

Laboratory of experimental immunopathology, Humanitas University

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**Abstract**

Cancer-related inflammation, including the presence of inflammatory leukocytes in the tumor microenvironment (TME) is recognised as a hallmark of cancer. Neutrophils are present in the TME but their role in cancer remains poorly understood and controversial. Recently, our group revealed the clinical significance of tumor-associated neutrophils in patients with colorectal cancer (Galdiero MR et al, 2016) and that neutrophils play an essential role in the induction of a novel antitumor response in mice and selected human tumors (Ponzetta A et al, 2019).

Using a multitask approach, combining state-of-the-art technologies, genetically engineered mice, models of primary carcinogenesis and investigation in human samples, our project aims to dissect the role played by neutrophils in the process of tumor immunoediting (the process in which the host immune system shapes the tumor fate) and in response to cancer immunotherapies. Our project can pave the way for innovative therapeutic approaches.

**Main technical approaches**

- Animal handling (Murine models of carcinogenesis)
- Blood and tissues sampling from mice
- Cellular Biology (purification and culture of cells from blood and tissues, culture of cell lines)
- Flow cytometry
- Molecular Biology (PCR, Real-time PCR, RNAsequencing)
- Bioinformatics analysis

**Scientific references**

1. Neutrophil diversity and plasticity in tumour progression and therapy.

Jaillon S, Ponzetta A, Di Mitri D, Santoni A, Bonecchi R, Mantovani A*. Nat Rev Cancer. 2020. Sept; 20(9):485-503.

2. Neutrophils driving unconventional T cells mediate resistance against murine sarcomas and selected human tumors.

Ponzetta A, Carriero R, Carnevale S, Barbagallo M, Molgora M, Perucchini C, Magrini E, Gianni F, Kunderfranco P, Polentarutti N, Pasqualini F, Di Marco S, Supino D, Peano C, Cananzi F, Colombo P, Pilotti S, Alomar SY, Bonavita E, Galdiero MR, Garlanda C, Mantovani A, Jaillon S. Cell. 2019. Jul 11;178(2):346-360.

3. IL-1R8 is a checkpoint in NK cells regulating anti-tumor and anti-viral activity.

Molgora M, Bonavita E, Ponzetta A, Riva F, Barbagallo M, Jaillon S, Popović B, Bernardini G, Magrini E, Gianni F, Zelenay S, Jonjić S, Santoni S, Garlanda C, Mantovani A. Nature. 2017. Nov 2;551(7678):110-114.

4. Occurrence and significance of tumor-associated neutrophils in patients with colorectal cancer.

Galdiero MR, Bianchi P, Grizzi F, Di Caro G, Basso G, Ponzetta A, Bonavita E, Barbagallo M, Tartari S, Polentarutti N, Malesci A, Marone G, Roncalli M, Laghi L, Garlanda C, Mantovani A, Jaillon S. Int J Cancer. 2016 Jul 15;139(2):446-56.

5. PTX3 is an extrinsic oncosuppressor regulating complement-dependent inflammation in cancer

Bonavita E, Gentile S, Rubino M, Maina V, Papait R, Kunderfranco P, Greco C, Feruglio F, Molgora M, Laface I, Tartari S, Doni A, Pasqualini F, Barbati E, Basso G, Galdiero M.R, Nebuloni M, Roncalli M, Colombo, P., Laghi, L., Lambris J.D, Jaillon S, Garlanda C, Mantovani A. Cell. 2015. Feb; 160(4):700-14.

**Type of contract**

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Borsa di dottorato pari a € 18.000 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.

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