PROJECT 1

DoS: Renato Ostuni

Title: Spatial diversity of tumor-associated macrophages

Curriculum: Basdic and Applied Immunology and Oncology

Link to OSR/UniSR personal page: https://research.hsr.it/en/institutes/san-raffaele-telethon-institute-for-gene-therapy/genomics-of-the-innate-immune-system.html

Project description (*Number of characters*, *including spaces*: 2.000 - 3.000):

Tumor-associated macrophages (TAMs) represent a key component of the tumor ecosystem. During homeostasis, tissue-resident macrophages exert a variety of homeostatic activities - such as trophic support, matrix remodeling, maintenance of stem cell niches, angiogenesis, and immune modulation. The latter properties are coopted in cancer, leading to tumor progression. This project is based on the recent identification in the group of distinct subpopulations of TAMs that differentially contribute to pancreatic cancer. The successful candidate will investigate the transcriptional and functional diversity of TAMs in mouse models of PDAC as well as in human samples of primary PDAC and PDAC-associated liver metastases. The tissue distribution of TAM subsets will be mapped using the most advanced technologies for spatial transcriptomics. Relevant cell-cell interactions will be inferred based on RNA-Seq data analyses, validated by imaging, and functionally dissected using appropriate cellular models. If successful, this project will highlight targets for therapeutic intervention in PDAC.

Skills to be acquired by the student (*Number of characters*, *including spaces*: max 600):

The candidate is expected to develop critical thinking and appropriate degrees of scientific independence and organization/presentation skills. She/he will gain experience with bulk, single-cell and spatial transcriptomics, as well as with advanced tissue imaging methods. Applications from candidates with a mixed or a fully computational background are strongly encouraged.

References (max. 15)

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Cell, 2013 | doi: 10.1016/j.cell.2012.12.018. Ostuni R§, Piccolo V, Barozzi I, Polletti, Termanini A, Bonifacio S, Curina A, Prosperini E, Ghisletti S, Natoli G§.

8) CD14 and NFAT mediate lipopolysaccharide-induced skin edema formation in mice.
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