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Università Vita-Salute
San Raffaele

**APPLICATION TO ACT AS SUPERVISOR AND
RESEARCH PROJECT PROPOSAL**

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A PhD project is available to elucidate the relationship between cancer cells, nerve invasion and immune infiltrates in PDAC. The PhD candidate will be asked to investigate the interactions between cancer cells, immune cells and nerves exploiting an ad hoc developed in vitro system of neuron/SCs, immune cells and PDAC organoids, developed in our laboratory. All in vitro results will be validated in vivo in an already available animal model, which is clinically relevant to investigate tumor-nerve interactions in PDAC as it displays pronounced PNI closely recapitulating the human disease¹¹. We have recently performed spatial transcriptomic studies in this animal model, that will be questioned to confirm in vitro data.

Expected outcomes

The results of these studies might pave the way to elucidate the relationship between cancer cells, nerves and immune cells and define their spatial localization and functions. In addition, we will clarify the molecular events at the basis of PNI and correlate them to PDAC progression.

Skills that the student should acquire (max. 600 characters including spaces):

We expect the student to become skillful with complex in vitro culture systems, generation and maintenance of pancreatic organoids and in vivo analyses. Thus, he/she will acquire expertise in mouse genetics and in morphological analyses of the nervous system and of the pancreas. Further, he/she will become proficient in cell biology, mainly primary cultures and in the biochemical/functional characterization of nerve-glia cells-tumor cells interaction in tumor formation and spreading.

References (max. 15)

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11. Wang X, Istvanffy R, Ye L, Teller S, Laschinger M, Diakopoulos KN, *et al.* Phenotype screens of murine pancreatic cancer identify a Tgfa-Ccl2-paxillin axis driving human-like neural invasion. *J Clin Inv* 2023; 133(21):e166333.