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EXPLORING THE SPATIAL CODING IN OLFACTION WITH TRANSCRIPTOMICS AND MACHINE LEARNING

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(codice: kopvp5w; per utenti esterni: https://bit.ly/3u52CzH)
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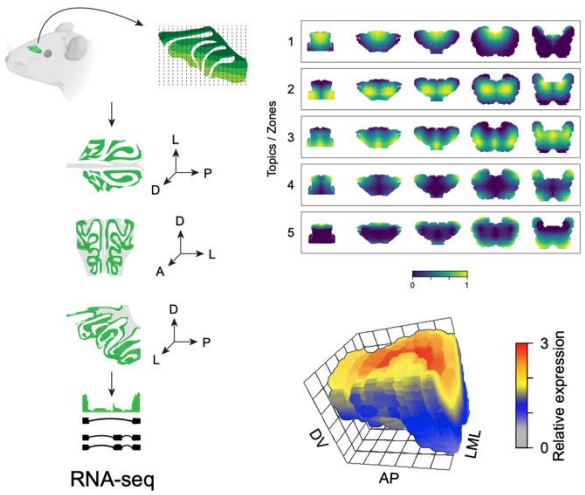
Odors are detected by a specialized set of cells called olfactory sensory neurons (OSNs). There are different subtypes of OSNs that detect specific subsets of odourants. OSN subtypes are organized in stereotypic anatomic locations of the olfactory epithelium called "zones". A comprehensive and quantitative mapping of the zones, as well as an understanding of their function, is still missing.

During this talk, I will present the analysis of a spatial transcriptomic dataset that allowed us to build the first transcriptome-wide tridimensional map of the olfactory epithelium. Using machine learning methods, we have quantitatively identified the "zones" and characterized their transcriptional signature. Finally, I will show how the distribution of olfactory receptors inside the zones suggests they might be optimized to enhance odor discrimination.



Biosketch

Antonio Scialdone studied at the University of Naples “Federico II”, where he got a BSc, MSc and PhD in Physics. During the PhD, he applied Statistical Physics techniques to investigate the mechanisms of stochastic gene expression and the spatial organization of DNA in the cell nucleus.

He then moved to the UK where he did a Postdoc at the John Innes Centre in the lab of Martin Howard, studying resource allocation in plants with mathematical models. After that, he did a Postdoc in Cambridge, at the EMBL - European Bioinformatics Institute and the Wellcome Sanger Institute in the lab of John Marioni. There, he pioneered the development of machine learning methods to analyse single-cell RNA-seq data and used it to analyse the early stages of mouse embryonic development.

He started his lab in 2017 at the Helmholtz Center in Munich, where he combines single-cell data analysis with physical modelling to understand cellular fate decision.