**RESEARCH TOPIC MECM_24**

# Influence of DOT1L on smooth muscle cell phenotypes at the single-cell level: specific role during atherosclerosis development in humans

**Curriculum**
MECM Standard

**Research Area**
Cardio

**Laboratory name**
Vascular Epigenetics

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**Abstract**
Histone methyltransferase DOT1L has emerged as a key epigenetic regulator of vascular cell identity and disease progression. In this project, we will employ a Dot1l animal model to investigate the role of DOT1L in smooth muscle cell (SMC) biology during atherosclerosis development. Using single-cell RNA sequencing, we will characterize SMC phenotypic transitions and identified distinct transcriptional states associated with disease progression. Integration of lineage tracing and in vivo atherosclerosis models will reveal how loss of DOT1L alters SMC plasticity, promoting the emergence of modulated cell populations that contribute to plaque formation and instability.

**Main technical approaches**
Animal model; RNA sequence; Single-cell analysis; Immunohistochemistry; Cell biology; Molecular biology.

**Scientific references**
1. Owens (2004). DOI: 10.1152/physrev.00041.2003

2. Pan (2020). DOI: 10.1161/CIRCULATIONAHA.120.04837

3. Wirka (2019). DOI: 10.1038/s41591-019-0512-5

4. Farina FM (2022). DOI: 10.1093/eurheartj/ehac097

**Type of contract**

Scholarship of € 24.500 gross per year awarded by Istituto Clinico Humanitas. This sum is subject to IRPEF income tax and exempt from social security contributions.

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