

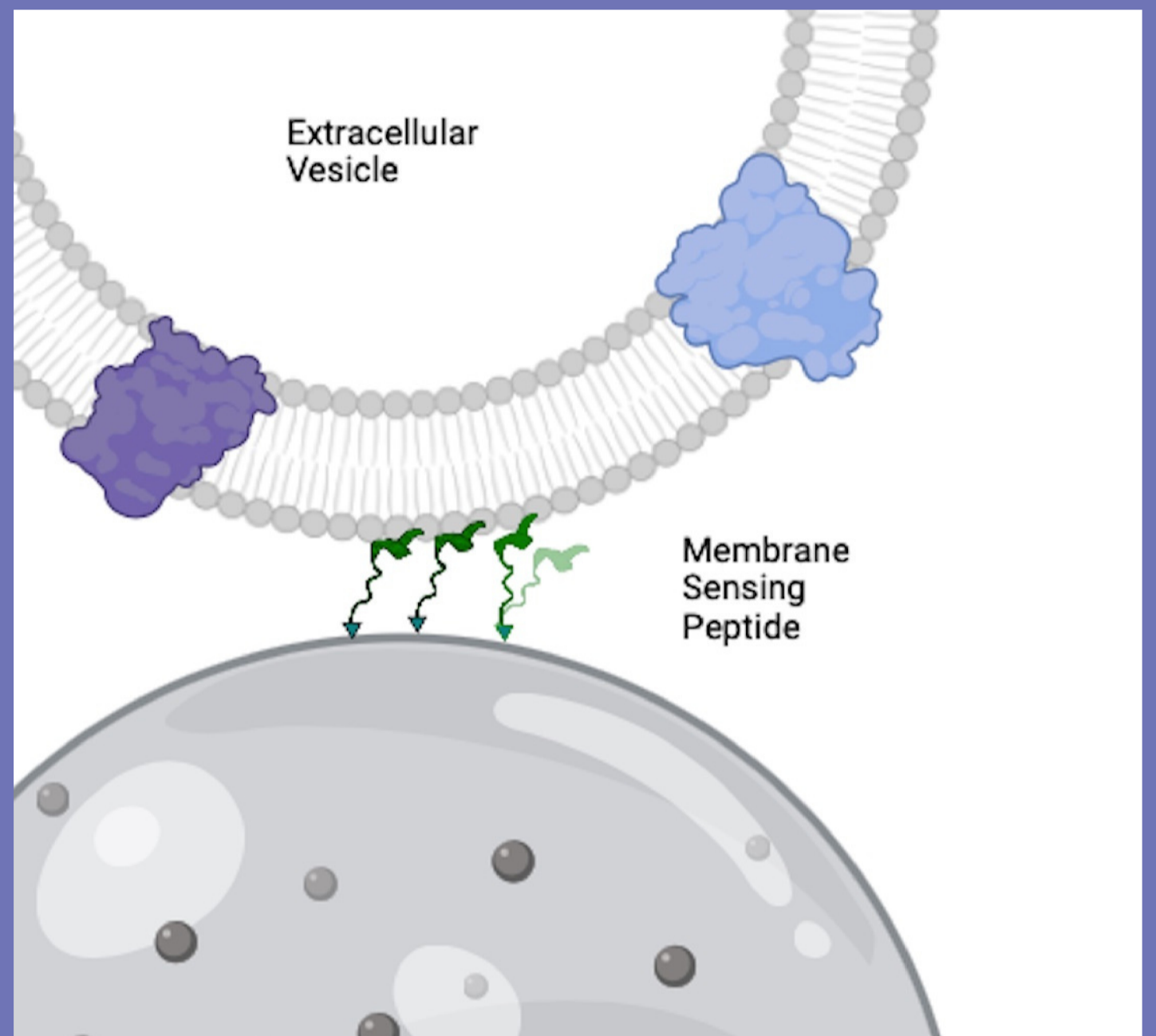
26TH FEBRUARY AT 16.00 P.M.
ROOM A 208 | POVO 1

CIBIO
EXTERNAL
seminar

TACKLING THE CHALLENGE OF HETEROGENEITY IN EXTRACELLULAR VESICLE ANALYSIS: MEMBRANE SENSING PEPTIDES AS A NOVEL DIMENSION TO THE FIELD

MARINA CRETICH

CNR, INSTITUTE OF
CHEMICAL SCIENCE AND
TECHNOLOGY "GIULIO
NATTA" (SCITEC-CNR),
MILAN, ITALY



Extracellular Vesicles (EVs), crucial mediators of **cell-to-cell communication**, hold **significant diagnostic potential** due to their ability to concentrate protein biomarkers in bodily fluids. However, challenges in isolating EVs from complex biological specimens hinder their widespread use. The preferred strategy involves direct analysis, integrating isolation and analysis solutions, with immunoaffinity methods currently dominating the field. Yet, the **heterogeneous nature of EVs** poses challenges, as proposed markers may not be as universally present as thought, raising **concerns about biomarker screening reliability**. This issue extends to EV-mimics and analogues, where conventional methods may lack applicability. Addressing these challenges, we report on **Membrane Sensing Peptides (MSP)** as "universal" affinity **ligands** for both EVs and analogues, streamlining capture and phenotyping through Single Molecule Array (SiMoA). MSP ligands **enable direct analysis of circulating EVs**, eliminating the need for prior isolation. Demonstrating clinical translation, MSP technology detects an EV-associated epitope signature in serum and plasma, distinguishing myocardial infarction from stable angina. Additionally, MSP allows analysis of tetraspanin-lacking Red Blood Cell-derived EVs, overcoming limitations associated with traditional antibody-based methods. Overall, our work underlines the **value of MSP as complementary tools to antibodies**, advancing EV analysis for clinical diagnostics and beyond and marking the first-ever peptide-based application in SiMoA technology



DEPARTMENT OF CELLULAR, COMPUTATIONAL
AND INTEGRATIVE BIOLOGY - CIBIO
VIA SOMMARIVE, 9
38123 - POVO (TN)
COMUNICAZIONE.CIBIO@UNITN.IT



UNIVERSITÀ
DI TRENTO

Department of
Cellular, Computational and Integrative Biology - CIBIO