ISTITUTO PASTEUR ITALIA
SEMINAR

Lunedì 3 Giugno 2024, ore 15.00

SSAS, Building D, AULA 101 (1 Piano)

Prof. Sara Sigismund, PhD

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Università degli Studi di Milano c/o
European Institute of Oncology

Organelle communication connects growth factor signalling to cell metabolism

The integration of distinct internalization routes is crucial to determine the fate of plasma membrane (PM) receptors and the output of their signalling pathways. Contact sites between cellular organelles adds a further layer of regulation by creating microdomains that governs different signalling and metabolic pathways. These regulatory mechanisms are relevant to the epidermal growth factor receptor (EGFR). Our research has revealed that, while clathrin-mediated endocytosis (CME) is mainly involved in EGFR recycling and sustaining signalling, EGFR internalization through non-clathrin endocytosis (NCE) leads primarily to receptor degradation and signal extinction, representing a crucial safety mechanism to protect cells from overstimulation. NCE involves contact sites between the PM, the endoplasmic reticulum and the mitochondria, that work as platforms for the modulation of localized calcium signalling and mitochondrial energetics. Importantly, this mode of regulation extends beyond EGFR to encompass other growth factor receptors and is anticipated to be relevant in tumours. In my laboratory, we are currently elucidating how the integration of distinct endocytic pathways and inter-organelle crosstalk regulate growth factor receptor signalling and its interplay with cell metabolic functions in physiology and cancer.

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