

## **The flow cytometry approach to the analysis and separation of nanovesicles**

***Subtitle: How to squeeze a flow cytometer like an orange***

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Flow cytometry (FCM) is becoming a key technology in studying and characterization of micro and nano sized particles (Ps) and extra vesicles (EVs).

The existing commercial instruments do not have an adequate resolution to discriminate particles at sub-micron scale dimension. However, it is possible to optimize the resolution through appropriate FCM strategies. The chances of success increase by using fluorescence, which becomes crucial in identification and separation of micro and nano Ps or EVs. In addition, FCM is particularly interesting also because the ability to collect a very large number of events, to identify rare events and to record information on phenotypic expression adds to the ability to discriminate Ps and EV of very small dimensions.

The size and distribution assessments of micro and nano Ps or EVs are very important for various applications: medicine, ecology, microbiology and engineering too. In this presentation different FCM approaches, developed in our FCM facility and applied to the study Ps and EVs at sub-micron level, will be described: analysis and sorting of labelled exosomes and EVs, analysis of micro plastic, analysis of bacterial and viral particles.

Our data demonstrate the high potential of FCM but in order to obtain results of full trust, harmonization and cooperation between the different strategies is necessary.