Towards the Study of Exosomal Membrane Phase Transition

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In the last few years, it has been discovered that the majority of eukaryotic and prokaryotic cells release small lipid vesicles. These vesicles, generally called micro-vesicles or exosomes, are becoming the object of a great scientific interest, because of their role as carrier of information about progenitor cells, through their cargo of proteins and nucleic acids and the biochemical composition of their membrane [1]. Indeed, the discovery of this important role of exosomes opened a completely new scenario for therapeutic and diagnostic applications.

Here we present a study of the temperature-induced phase transitions in the membrane of bacterial Outer-Membrane-Vesicles (OMVs) that are the bacterial analogous of exosomes from eukaryotic cells. In particular, we study the OMVs produced by Escherichia Coli because they are considered a model system for biological studies. Indeed, as known from the literature [2], Escherichia Coli membrane presents different temperature phase transitions due to structural changes in the organization of the lipid bilayer. In our study, we have studied the phase transition behaviour of the OMVs membrane by Light Scattering measurements at varying temperature [3]. OMVs were characterized by the presence of phase transitions similar to those revealed for E. Coli membrane but occurring at slightly different temperatures. This preliminary result suggests the possibility of distinguishing exosomes from different progenitor cells based on their phase transition profiles.