UNIVERSITÀ POLITECNICA DELLE MARCHE

RESEARCH AREA:
IMMUNOLOGY

TITLE: **Promising Extracellular Vesicle-Based Vaccines Against Vi-ruses, Including SARS-CoV-2**

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UNIVPM Research Group: Biologia Applicata

Research activity description: Extracellular vesicles (EVs) are secreted from almost all human cells and mediate intercellular communication by transferring heterogeneous molecules (i.e., DNA, RNAs, proteins, and lipids). In this way, EVs participate in various biological processes, including immune responses. Viruses can hijack EV biogenesis systems for their dissemination, while EVs from infected cells can transfer viral proteins to uninfected cells and to immune cells in order to mask the infection or to trigger a response. Several studies have highlighted the role of native or engineered EVs in the induction of B cell and CD8(+) T cell reactions against viral proteins, strongly suggesting these anti-gen-presenting EVs as a novel strategy for vaccine design, including the emerging COVID-19. EV-based vaccines overcome some limitations of conventional vaccines and introduce novel unique characteristics useful in vaccine design, including higher bio-safety and efficiency as an-tigen-presenting systems and as adjuvants. Here, we show the state-of-the-art for antiviral EV-based vaccines, including the ongoing projects of some biotech companies in the development of EV-based vaccines for SARS-CoV-2. Finally, we discuss the limits for further development of this promising class of therapeutic agents.

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