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Loading EVs using exogenous methods, for their further use of mRNA tumor vaccines

Vaccination has been one of the main successes of modern society, thus improving notably human beings' life expectancy. In fact, after the last Covid-19 pandemic, the role of vaccines has gained interest, being mRNA vaccines the first to arrive on the market at an unprecedented speed. Therefore, the role of mRNA as an antigen molecule has been demonstrated clear. Nevertheless, mRNA is labile and needs to be protected by a carrier. In addition, being an expensive macromolecule, its targeting to dendritic cells is key in terms of making all the administered dose is effective.

In this context, extracellular vesicles, natural lipid carriers that accomplish a communication function between cells, having a natural preference to be absorbed by the cell lineage as donor cells, could be advantageous. Thus, we propose here to use extracellular vesicles released from dendritic cells, engineered to carry exogenous mRNAs encoding for tumor associated antigens and become a naturally targeted mRNA vaccine. (*This project is in collaboration with an international group).

The objective of this project is to engineer dendritic cells released EVs to become mRNA vaccines:
1) Establishing an efficient method to load mRNA into EVs.
2) In vitro functional studies of engineered EVs.

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