Extracellular vesicles are spherical particles secreted by prokaryotic and eukaryotic cells, and have the ability to transport biologically active cargo, e.g. proteins and nucleic acids. As a result, the vesicles are involved in a number of important processes. For instance, the vesicles take part in the transfer of genes encoding drug resistance in bacteria, facilitate the process of growth and progression of cancer cells, and play an important role in the regulation of inflammatory processes in the human body. They have also found application as vaccines and drug carriers.

The isolation of vesicles from biological samples is a complex process, after which the isolates have to undergo characterization in terms of their quantity, purity and identity. Most of routinely used techniques for EVs quantitation like total protein content assays and particle-counting techniques (e.g. nanoparticles tracking analysis, NTA) suffer from low to moderate selectivity, which can lead to biased results in a consequence of co-isolation of impurities

Hence, the aim of this project is to develop an **innovative method of quality control of extracellular vesicle isolates based on the capillary electrophoresis**. Achieving the intended goal will allow to rapidly obtain information on the purity, cargo and identity of extracellular vesicles in the tested isolates. The proposed concept is green, minimize the sample (dozens of nL per run) and reagents consumption (few μL per run), and automate the whole analytical process. It will significantly reduce the costs associated with the characterization of extracellular vesicles and will improve the safety of biotechnological products containing extracellular vesicles, dedicated to the medical applications (e.g. vaccines).