# Abstract

Cancer is a leading cause of death worldwide, and it is a condition that occurs when cells in the body divide and grow uncontrollably. These abnormal cells can form tumors that can invade and destroy surrounding healthy tissue.

In this research, we sought to discover the relationship between cancer cells possessing gain of function (GOF) mutation in P53 gene and M1 macrophages. P53 is a gene responsible for cell proliferation regulation, and p53 is mutated in most of the cancers.

Our research question tries to find out what is the effect that p53 mutated cancer cells-derived exosomes, “cargo ships” of the cell, on M1 macrophages, to better understand the bi-directional communication between tumor cells and immune cells such as macrophages in the tumor bed.

The experiment has included using of cell culture, exosomes and monocytes isolation, and more, for the purpose of simulating the interaction between the exosomes and the macrophages inside the patient’s bodies.

Our results indicate that when M1 macrophages were exposed to exosomes derived from cancer cells with a gain of function mutation in p53, they were able to sustain their M1 phenotype compared to their counterparts exposed to exosomes derived from cancer cells devoid of p53. Further research would definitely help us to better understand the complex process of cancer metastasis.