Characterization and comparative analysis of the effects of *Artemisia abrotanum, Artemisia annua* and *Artemisia vulgaris* on colorectal cancer cell lines

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Abstract: Colorectal cancer (CRC) is the third most common cancer and the fourth most common cause of cancer-related death worldwide. Most cases of CRC are detected in Western countries, with incidence increasing year by year. The risk for developing CRC is associated with personal features or habits such as age, chronic disease history and lifestyle[1]. The main current treatments for CRC involve the use of chemotherapeutic agents such as 5-fluorouracil and irinotecan which, however, like most chemotherapeutics, induce side effects in patients. For these reasons, it is necessary to find new compounds capable of treating this type of cancer or, at least, acting as adjuvants to conventional chemotherapy[2].

In this project we will investigate the effects on CRC cell lines of three different species of *Artemisia*, namely *Artemisia abrotanum*, *Artemisia annua* and *Artemisia vulgaris,* which have been shown to have an anti-tumoral activity on different types of solid tumours. We are studying CRC cell lines SW480 (the primary tumour) and SW620 (its metastasis), both with a mutation in *KRAS*.

First, we will evaluate the selective toxicity on CRC cell lines compared to healthy cell lines using an MTT assay. Then, we will study the proliferation focusing on cell migration, using a wound healing assay, and on cell cycle using flow cytometry and evaluating its main markers through western blot analysis. In addition, we will analyse autophagy and apoptosis markers using western blot, and then the oxidative stress by measuring glutathione levels, reactive oxygen species (ROS) and key enzymes involved in detoxification processes.

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