The goal is to develop a nanoparticle whose main purpose will be the targeted treatment of a target tissue. Targeted cancer treatment has been in use for the past 10 years, having dramatically changed the survival statistics of cancer patients and is based on understanding the differences between cancer and normal cells. "Smart drugs" target cancer cells, leaving virtually unaffected normal cells in the body. So treatment is more effective and less toxic.

In this project we will use magnetic iron oxide nanoparticles, which will be coated with citric acid as surfactant. Magnetic nanoparticles have, as is well known, properties that make them valuable tools in the field of biomedical engineering. Initially they have an adjustable size ranging from a few to tens of nm, that is, size comparable to that of the cell, virus or gene. The main property of magnetic nanoparticles used in biomedical applications is magnetism. Their main applications are drug delivery with the use of external magnetic fields (magnetic targeting), heat generation (hyperthermia) and magnetic resonance imaging.

The active substance to be used will be Morin belonging to the flavonoid family. In general, flavonoids are one of the largest chemical classes of secondary metabolites found in the plant kingdom. Although not related to the survival of a plant, they give plants intense colors and play an important role in protecting them from pathogenic microorganisms, ultraviolet rays and herbivores. They have antioxidant, anti-allergic, diuretic and anti-inflammatory effects. Their contribution to human health has proven to be beneficial in many cases by activating enzymes that reduce the likelihood of certain types of cancer, heart disease, and degenerative diseases associated with aging. Some of these substances also contribute to better tooth health and reduce the incidence of common diseases such as influenza. Morin's molecule can create many forms of coordination that lead to the stabilization of free radicals. It is also a molecule that has not been studied very much and it would be interesting to examine it.

Liposomes are small, artificial lipid vesicles that are spontaneously assembled by amphiphilic phospholipids and predominantly cholesterol. They consist of a spherical bilayer structure surrounding an aqueous core. Their size ranges from 50 nm to 5 μm. They are at the forefront of research interest as carriers of drugs and biologically active substances due to their following biological properties:

• They are biocompatible and biodegradable.

• They isolate drugs from the environment.

• They have the ability to trap hydrophilic and hydrophobic drugs.

In addition, it is possible to adjust their properties such as their size and surface load by adding a variety of factors to the lipid membrane. Finally, a bioavailability, toxicity study will be performed and the release of the drug from the nanoparticle we have created will be studied