Gastrointestinal cancer: hyperthermia treatment

Consolacion Melguizo[1],
Lidia Gago[1], Ana Cepero[1], Gloria Perazzoli[1], Francisco Quiñonero[1], Maria del Mar Chico[1], Cristina Mesas[1], Cristina Jimenez-Luna[1], Javier Moreno[1], Laura Cabeza[1]

[1]Institute of Biopathology and Regenerative Medicine (IBIMER), Center of Biomedical Research (CIBM), University of Granada, 18100 Granada, Spain.

melguizo@ugr.es

Abstract
In recent years, unhealthy habits such as smoking, lack of physical activity and an unbalanced diet have contributed to the increase in the incidence and mortality of several types of gastrointestinal cancer, with colorectal cancer being the third in incidence and the second in mortality, followed by stomach and esophageal cancer [1]. Furthermore, current cancer treatments have many associated problems, so there is a need to look for new therapeutic options that can improve the quality of life of patients. Nanomedicine has emerged as a promising alternative to improve both the diagnosis and treatment of cancer. Nanoformulations can deliver drugs directly to the tumor region, improving the precision of treatment, increasing the amount of drug at the target site, and reducing side effects. Among these nanoformulations, magnetic nanoparticles [2,3] have unique physicochemical properties that allow them to be used in the diagnosis and treatment of cancer. They can be directed to the tumor region by applying a magnetic field and are used as contrast agents in various imaging techniques. Furthermore, magnetic nanoparticles have the ability to generate high temperatures in the tumor region after being exposed to an alternating external magnetic field. This characteristic is used to employ combined chemotherapy and hyperthermia treatments, which increases the antiproliferative activity of the treatment and improves effectiveness both in vitro and in vivo. Therefore, in the present work the most recent results obtained through the application of hyperthermia in the treatment of gastrointestinal cancers have been analyzed, highlighting the advantages of this emerging therapy.

References

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[2] Wu, K.; Su, D.; Liu, J.; Saha, R.; Wang, J.-P. Nanotechnology 2019, 30, 502003.
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Figures

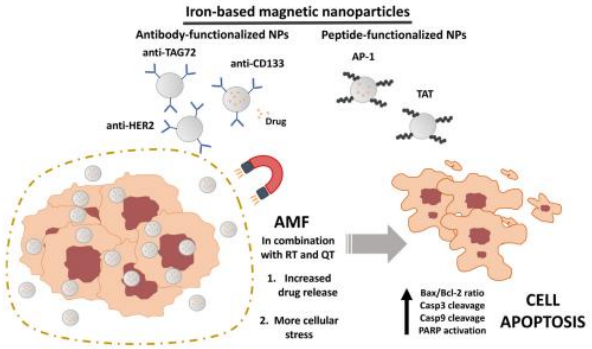

Figure 1. Use of magnetic nanoparticles in in vitro AMF hyperthermia application experiment.

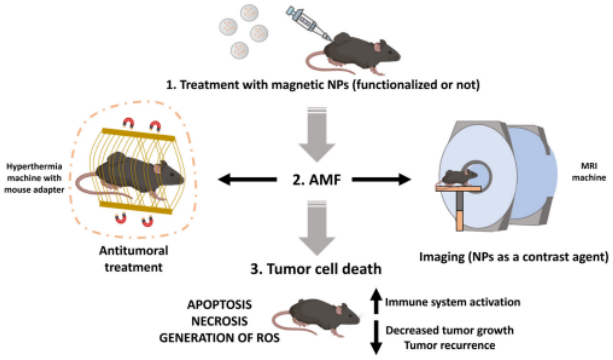

Figure 2. Use of magnetic hypothermia in in vivo experiments.