



# Magnetic drug-carrying nanoparticles in cancer treatments

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## 1 INTRODUCTION

Magnetic nanoparticles are nanomaterials that are magnetically influenced by an external gradient. The engineering and manipulation of matter at the molecular level presents several advantages in the field of nanomedicine since most biological molecules exist and function at the nanoscale. Magnetic nanoparticles are promising methods for targeted drug delivery that allow for spatially, temporally and dosage-tunable drug release with minimal side effects. The most commonly used magnetic nanoparticles are Magnetite ( $\text{Fe}_3\text{O}_4$ ) and Maghemite ( $\text{Fe}_2\text{O}_3$ ). The function of drug carriers, or "Drugs delivery" is to take the drug to the pharmacological target, reducing the side effects observed in the drugs, also reducing the amount of drug administered, thus obtaining the pharmacological treatment in an optimized way. This study aims to analyze the use of drug-loading magnetic nanoparticles in cancer treatments.

## 2 METHODOLOGY

This is a literature review, conducted by searching the academic databases "Sciencedirect", "Scielo" and "PubMed", using as descriptors "Biomedical application", "Drug delivery" and "Magnetic nanoparticles", selecting articles published in 2022 and in English. After the search, the results found were: 38 articles in Sciencedirect, 0 article in Scielo, 10 articles in Pubmed, totaling 48 articles. Of these, 11 presented the proposed theme, 2 from Sciencedirect and 9 from Pubmed, were read and 9 were used.

## 3 CONCLUSION

Of the 9 (100%) articles, 7 (77.78%) demonstrated the use of magnetic nanoparticles as drug carriers in cancer treatments. NAEIMI, R.; et al. (2022) observed the application of magnetic nanoparticles as drug carriers, being used for colorectal cancer, which currently present treatment that include chemotherapy, which often is not successful due to side effects, being the application of magnetic nanoparticles as drug carriers an option to optimize the treatment, using low concentrations and reduced adverse effects. DEMIN, A., M.; et al. (2022) analyzed the use of  $\text{Fe}_3\text{O}_4$  magnetic drug-loading nanoparticles with Doxorubicin and



its positive effects on cancer cell lines. Thus, it can be concluded that the drug-loading magnetic nanoparticles presented use in cancer treatments.