Functionalization of Magnetic Nanoparticles with Tryptophan and Isatin for Enhanced Glioblastoma Treatment

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The dynamic landscape of cancer therapy demands novel approaches for effective diagnosis and treatment [1,2]. This study presents the synthesis of magnetic nanoparticles (MNPs), and functionalized with a unique molecules, Tryptophan (Trp) and isatin, showing affinity to brain components. A comprehensive characterization through the use of SEM-EDS, FTIR, XPS, and DLS techniques provides an in-depth understanding of the physicochemical properties of the nanoparticles. *In vitro* evaluations on U-87 glioblastoma cells examine crucial factors, including cell adhesion, viability, and potential responsiveness to radiotherapy. This research investigates the potential practical applications of Trp-isatin functionalized MNPs in the treatment of glioblastoma. The preliminary findings suggest that MNPs have the potential to serve as multifaceted agents in glioblastoma therapy. The conjugation of Trp and isatin enhances molecular specificity, suggesting new possibilities for targeted treatment. Additionally, the study highlights the capacity of these MNPs to boost the effectiveness of radiotherapy, indicating their potential role as radiosensitizers. This work contributes to the growing field of nanomedicine and holds promise for advancing targeted treatments for glioblastoma, potentially leading to innovative strategies in the ongoing fight against this challenging disease.

References

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