

Special Issue on
Use of Nanomedicines in the Treatment of Brain Tumors

CALL FOR PAPERS

Malignant brain tumors (*e.g.*, glioblastoma) are some of the most fatal neoplasms with high heterogeneity and mortality. The blood-brain barrier (BBB) blocks the penetration of macromolecules (~100%) and small molecules (> 95%, *e.g.*, antitumor drugs) to the brain. Additionally, brain tumors have unique development, progression, and metastasis features influenced by multidrug resistant pathways. The aggressive and invasive nature of brain tumors is a critical reason for diagnostic failure, leading to a low 5-year survival rate of 35%. Brain tumor patients frequently relapse in spite of conventional treatments such as radiotherapy, chemotherapy, immunotherapy, and surgery.

Nanomedicines to treat brain tumors can be prepared from polymeric materials such as poly(ethylenimine), poly(alkylcyanoacrylates), poly(amidoamine) dendrimers, poly(ϵ -caprolactone), poly(lactic-co-glycolic acid), polyesters (poly(lactic acid), polysaccharides (*e.g.*, chitosan and alginate), amino acids (poly(lysine), poly(aspartic acid)), or proteins (*e.g.* gelatin and albumin) or from inorganic materials including gold, silicon dioxide, iron oxide, and quantum dots for imaging or synergistic therapy. Nanomedicine has taken many forms over the past decade to address various drawbacks in brain tumor treatment through novel designs. Liposomes, lipid nanoparticles, nanofibers, dendrimers, nanoemulsions, polymeric micelles, and inorganic nanoparticles are extensively exploited to cure brain tumors as nanoplatfoms. The established surface-chemistry on the nanoparticles can allow for deep penetration in brain tumors. Nanocarriers can control the release rate of drugs for sustainable treatment with high cancer specificity. Nanoplatforms with multiple types of drugs have bypassed drug resistant pathways. However, there are many problems that should be addressed for practical use of nanomedicines in the treatment of brain tumors. Although drugs based on nanoplatfoms can penetrate the tumor up to several millimeters, they are still unsuitable for reaching deeper regions of the human brain. Also, drugs might accidentally be released prematurely from their parent nanoplatfoms before reaching the brain tumor site, resulting in toxicity to normal cells.

We welcome the submission of original research as well as review articles that address specific targeting, bypassing multidrug resistance and the BBB, and deeper penetration of nanomedicines in the field of brain tumor treatment.

Potential topics include but are not limited to the following:

- ▶ Nanomedicines to specifically target brain tumor
- ▶ Research on nanomedicines that can overcome the brain-blood barrier (BBB)
- ▶ Research on nanomedicines that can overcome multidrug resistance
- ▶ Sustained release of nanomedicine in brain tumors
- ▶ Nanomedicines to target brain tumors with deep penetration

Authors can submit their manuscripts through the Manuscript Tracking System at <https://mts.hindawi.com/submit/journals/jo/ntbt/>.

Papers are published upon acceptance, regardless of the Special Issue publication date.

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