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Delivery of temozolomide to the tumor bed via biodegradable gel matrices in a novel model of intracranial glioma with resection.

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Introduction We have completed in vivo safety and efficacy studies of the use of a novel drug delivery system, a gel matrix-temozolomide formulation that is injected intracranially into the post-resection cavity, as a candidate for glioma therapy. **Methods** A rat intracranial resection model of C6-GFP intracranial glioma was used for safety and toxicity studies. Biodistribution studies were performed using gel matrix-galloycyanine formulations and were evaluated at various time intervals using real-time analysis of dye distribution. Additionally, the resection model was used to determine the efficacy of gel matrix-temozolomide as compared to blank gel matrix. A subcutaneous human xenograft glioma model was used to further assess the efficacy of gel matrix-temozolomide in reducing the overall tumor load. **Results** Gel matrix-temozolomide exhibited minimal cytotoxicity toward normal brain tissue while displaying high levels of oncolytic activity toward glioma cells. In the intracranial glioma resection and subcutaneous glioma model, administration of gel matrix-temozolomide directly to the tumor bed was well tolerated and effective at reducing the tumor load. A significant reduction of tumor load was observed ($P < 0.0001$) in the 30% temozolomide group (~95%) as compared to blank control. There was little morbidity and no mortality associated with gel matrix treatment. **Conclusions** Gel matrix-temozolomide appears to be safe and effective when used in vivo to treat intracranial glioma and warrants further development as a potential adjuvant therapy.

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