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Local delivery of nanomedicines-loaded hydrogel for the treatment of glioblastoma

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Glioblastoma (GBM) are malignant brain tumors that arise from astrocytes. The annual global incidence of GBM is 6 per 100,000: each year. There is no accepted treatment to prevent recurrences of GBM, in particular from infiltrating cells at the border of resection. Therefore, this clinical situation is considered as an unmet medical need. Two types of hydrogels have been selected to fit the following clinically relevant requirements: injectability, biocompatibility, and very limited cell infiltration. First, polyethylene glycol-based copolymer hydrogels for the delivery of Temozolomide. Second, a specific formulation of lipid nanocapsules that presents adapted rheological properties to directly form a hydrogel for the delivery of Gembictabine. We have shown that hydrogels allow the sustained release of anti-cancer drugs, are well tolerated *in-vivo* over one week and can significantly reduce the growth of subcutaneous U87MG tumor-bearing nude mice. Thus, these data support the hypothesis that hydrogel could be injected at the resection site and provide a sustained and local delivery of anti-cancer drugs-loaded nanomedicines that will enable GBM to be treated by maintaining a therapeutic concentration at the resection borders as well as ensuring a sustained diffusion in the surrounding tissue. These approaches provide different perspectives in the development of nanomedicine-loaded hydrogels in relation with the GBM recurrences.

Biography

Fabienne Danhier has completed her PhD from the Université catholique de Louvain under the supervision of Prof. V. Préat and Post-doctoral studies from the INSERM U1066 (Prof. J.P. Benoit), Angers, France. She is currently supervising the group of "nanomedicines for the delivery of anti-cancer drugs" of the Advanced Drug Delivery and Biomaterials laboratory. She has published more than 25 papers in reputed journals. Two of her papers have been awarded as the first and third papers cited in the 3rd journal in the SJR indicator in *Pharmaceutical Science: Journal of Controlled Release*.

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