Lauroyl-gemcitabine-loaded lipid nanocapsule hydrogel for the treatment of glioblastoma

Submitted by Marion Pitorre on Tue, 02/09/2016 - 15:24

Titre
Lauroyl-gemcitabine-loaded lipid nanocapsule hydrogel for the treatment of glioblastoma

Type de publication
Article de revue

Auteur
Bastiancich, C [1], Vanvarenberg, K [2], Ucakar, B [3], Pitorre, Marion [4], Bastiat, Guillaume [5], Lagarce, Frédéric [6], Préat, Véronique [7], Danhier, Fabienne [8]

Editeur
Elsevier

Type
Article scientifique dans une revue à comité de lecture

Année
2016

Langue
Anglais

Date
2016 mar

Pagination
283-293

Volume
225

Titre de la revue
Journal of Controlled Release

ISSN
1873-4995

Mots-clés
Lipid nanocapsules; Gemcitabine; Hydrogel; Nanomedicine; Glioblastoma [9]

Résumé en anglais
The local delivery of chemotherapeutic agents is a very promising strategy for the treatment of glioblastoma (GBM). Gemcitabine is a chemotherapeutic agent that has a different mechanism of action compared to alkylating agents and shows excellent radio-sensitizing properties. So, we developed an injectable gel-like nanodelivery system consisting in lipid nanocapsules loaded with anticancer prodrug lauroyl-gemcitabine (GemC12-LNC) in order to obtain a sustained and local delivery of this drug in the brain. In this study, the GemC12-LNC has been formulated and characterized and the viscoelastic properties of the hydrogel were evaluated after extrusion from 30G needles. This system showed a sustained and prolonged in vitro release of the drug over one month. GemC12 and the GemC12-LNC have shown increased in vitro cytotoxic activity on U-87 MG glioma cells compared to the parent hydrophilic drug. The GemC12-LNC hydrogel reduced significantly the size of a subcutaneous human GBM tumor model compared to the drug and short-term tolerability studies showed that this system is suitable for local treatment in the brain. In conclusion, this proof-of-concept study demonstrated the feasibility, safety and efficiency of the injectable GemC12-LNC hydrogel for the local treatment of GBM.

URL de la notice
http://okina.univ-angers.fr/publications/ua14433 [10]

DOI

Autre titre
J Control Release

Identifiant (ID) PubMed
26829100 [12]
Liens


Publié sur Okina (http://okina.univ-angers.fr)