In vitro anti-cancer activity and pharmacokinetic evaluation of curcumin-loaded lipid nanocapsules

Titre	In vitro anti-cancer activity and pharmacokinetic evaluation of curcumin-loaded lipid nanocapsules
Type de publication	Article de revue
Auteur	Lollo, Giovanna [1], Ullio Gamboa, Gabriela Veroniva [2], Fuentes, Edmundo [3], Matha, Kevin [4], Lautram, Nolwenn [5], Benoît, Jean-Pierre [6]
Editeur	Elsevier
Type	Article scientifique dans une revue à comité de lecture
Année	2018
Langue	Anglais
Date	1er Oct. 2018
Pagination	859-867
Volume	91
Titre de la revue	Materials science & engineering. C, Materials for biological applications
ISSN	0928-4931
Mots-clés	9L cell line [7], Curcumin [8], Glioma [9], Intravenous administration [10], Lipid nanocapsules [11]
Résumé en anglais	In the present work, lipid nanocapsules (LNC) for curcumin (CCM) encapsulation have been developed and optimized. The objective was to increase drug cytotoxicity on 9L glioma cells and drug bioavailability following intravenous administration (IV). Using the phase inversion technique, we obtained 50 nm LNC loaded with CCM (4 and 6 mg/mL) and, due to the hydrophobic nature of the drug, the encapsulation efficiency was very high, being around 90%. Following 48 h of incubation with 9L cells, CCM-loaded LNC were able to reduce the viability of glioma cells resulting in significant twofold lower IC50 in comparison with the free drug solution. Moreover, CCM-loaded LNC induced both the apoptosis of 9L cells and a strong release of ATP. This suggests a cellular uptake of the LNC and an enhanced anti-proliferative effect. In order to evaluate any alteration in the pharmacokinetic behavior of the encapsulated drug, CCM-loaded LNC were injected IV into healthy rats, at a dose of 10 mg/kg. CCM pharmacokinetic studies were carried out quantifying the CCM concentration from the blood of rats, receiving either CCM-loaded LNC or free CCM solution as a control. The results demonstrated that loaded LNC exhibited a significantly higher AUC, C and t in comparison with the control, while the clearance was strongly reduced. Globally, these results encouraged the use of CCM-loaded LNC to enhance the in vivo therapeutic activity of the drug after systemic administration.
URL de la notice	http://okina.univ-angers.fr/publications/ua17547 [12]
DOI	10.1016/j.msec.2018.06.014 [13]
Lien vers le document	https://www.sciencedirect.com/science/article/pii/S0928493117339206?via%... [14]

Titre abrégé	Mater Sci Eng C Mater Biol Appl
Identifiant (ID) PubMed	30033321 [15]

Liens
[1] http://okina.univ-angers.fr/giovanna.lollo/publications
[2] http://okina.univ-angers.fr/publications?f%5Bauthor%5D=24321
[3] http://okina.univ-angers.fr/publications?f%5Bauthor%5D=29084
[4] http://okina.univ-angers.fr/publications?f%5Bauthor%5D=27001
[5] http://okina.univ-angers.fr/n.lautram/publications
[6] http://okina.univ-angers.fr/j.benoit/publications
[7] http://okina.univ-angers.fr/publications?f%5Bkeyword%5D=25328
[8] http://okina.univ-angers.fr/publications?f%5Bkeyword%5D=23152
[9] http://okina.univ-angers.fr/publications?f%5Bkeyword%5D=8435
[10] http://okina.univ-angers.fr/publications?f%5Bkeyword%5D=25329
[11] http://okina.univ-angers.fr/publications?f%5Bkeyword%5D=8040
[12] http://okina.univ-angers.fr/publications/ua17547
[13] http://dx.doi.org/10.1016/j.msec.2018.06.014
[14] https://www.sciencedirect.com/science/article/pii/S0928493117339206?via%3Dihub
[15] http://www.ncbi.nlm.nih.gov/pubmed/30033321?dopt=Abstract