Self-assembled biotransesterified cyclodextrins as potential Artemisinin nanocarriers. II: In vitro behavior toward the immune system and in vivo biodistribution assessment of unloaded nanoparticles.

Titre	Self-assembled biotransesterified cyclodextrins as potential Artemisinin nanocarriers. II: In vitro behavior toward the immune system and in vivo biodistribution assessment of unloaded nanoparticles.
Type de publication	Article de revue
Auteur	Yaméogo, Josias BG [1], Gèze, Annabelle [2], Choisnard, Luc [3], Putaux, Jean-Luc [4], Mazet, Roseline [5], Passirani-Malleret, Catherine [6], Keramidas, Michelle [7], Coll, Jean-Luc [8], Lautram, Nolwenn [9], Bejaud, Jérôme [10], Semdé, Rasmané [11], Wouessidjewe, Denis [12]
Editeur	Elsevier
Type	Article scientifique dans une revue à comité de lecture
Année	2014
Langue	Anglais
Date	2014 Nov
Numéro	3
Pagination	683-94
Volume	88
Titre de la revue	European Journal of Pharmaceutics and Biopharmaceutics
ISSN	1873-3441

Résumé en anglais	In a previous study, we reported on the formulation of Artemisinin-loaded surface-decorated nanoparticles (nanospheres and nanoreservoirs) by co-nanoprecipitation of PEG derivatives (PEG1500 and PEG4000-stearate, polysorbate 80) and biosynthesized γ-CD fatty esters. In the present study, the co-nanoprecipitation was extended to the use of a PEGylated phospholipid, namely DMPE-PEG2000. As our goal was to prepare long-circulating nanocarriers for further systemic delivery of Artemisinin (ART), here, we have investigated, on the one hand, the in vitro behavior of these surface-modified γ-CD-C10 particles toward the immune system (complement activation and macrophage uptake assays) and, on the other hand, their biodistribution features in mice. These experiments showed that the in vitro plasma protein adsorption and phagocytosis by macrophage cells triggered by γ-CD-C10 nanoparticles were significantly reduced when their surface was decorated with amphiphilic PEGylated molecules, in particular PEG1500-stearate, DMPE-mPEG2000 or polysorbate 80. The prolonged blood circulation time assessed by fluorescence imaging was demonstrated for unloaded γ-CD-C10-based nanospheres and nanoreservoir particles containing DMPE-PEG2000 and polysorbate80, respectively. These nanoparticles also proved to be non-hemolytic at the concentration range used in vivo. Within the limits of the conducted experiments, the co-nanoprecipitation technique may be considered as an alternative for surface modification of amphiphilic CD-based drug delivery systems and may be applied to the systemic delivery of ART.
URL de la notice	http://okina.univ-angers.fr/publications/ua6683 [13]
DOI	10.1016/j.ejpb.2014.08.012 [14]
Lien vers le document	http://dx.doi.org/10.1016/j.ejpb.2014.08.012 [14]
Autre titre	Eur J Pharm Biopharm
Identifiant (ID) PubMed	25204521 [15]

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