Stealth nanocarriers based sterosomes using PEG post-insertion process

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Résumé en anglais	Sterosomes (STEs), a new and promising non-phospholipidic liposome platform based on palmitic acid (PA) and cholesterol (Chol) mixtures, need to have polyethylene glycol (PEG) chains grafted to their surface in order to obtain long-circulating nanocarriers in the blood stream. A post-insertion method was chosen to achieve this modification. The post-insertion process of PEG-modified distearoylphosphoethanolamine (DSPE-PEG) was monitored using the zeta potential value of STEs. Various conditions including PEG chain length and the DSPE-PEG/PA-Chol ratio, were explored. Zeta potential of STEs changed from about -40mV for non-modified STEs to values close to 0 mV by the end of the process, i.e. for PEG-modified STEs. The kinetics of DSPE-PEG insertion and the stability of the resulting PEG-modified STEs were not considerably influenced, within the investigated range, by changes in PEG chain lengths and in DSPE-PEG/PA-Chol proportion. The post-insertion of PEG chains reduced in vitro complement activation as well as in vitro macrophage uptake compared to the non-modified STEs. Moreover, longer blood circulation time in mice was established for PEG-modified STEs intravenously injected compared to non-modified STEs. These results establish that post-insertion process of PEG chains to STEs is a promising strategy for developing long-term circulating drug delivery nanocarriers.
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