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TITLE

Lipid based nano biodistribution of Lipidots® in FVB mice

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Nanovectorization is a promising strategy to improve the targeting of therapeutic agents. Lipidots are biocompatible lipid core nanoparticles [1], which display a long term colloidal stability in buffer (> 1 year at room temperature and at 40°C) [1] and an important volume reservoir for lipophilic drug loading [2]. Triply-labeled-particles incorporating two radiotracers (Cholesteryl-hexadecyl-ether-^{3}H and cholesteryl-oleate-^{14}C) and a fluorophore (DiD) were synthesized and their biodistribution and pharmacokinetics were quantitatively assessed in healthy mice. Passive tumour accumulation was also evaluated in PyMT tumour breast cancer cells injected in the mammary fat pad of FVB female mice.

The in vivo pharmacokinetics and biodistribution of 55nm diameter nanoparticles was investigated by ^{3}H and ^{14}C radioactivity counting and DiD fluorescence imaging (Fluobeam® 700). The biodistribution and pharmacokinetics of both radioactive and the fluorescence tracers loaded into triply-labeled Lipidots® were identical up to 8 hours post IV injection. In contrast, biodistribution and pharmacokinetics of free [^{3}H]CHE, [^{14}C]CO and DiD were completely different. Taken together, these results demonstrate that triply-loaded Lipidots® remain stable several hours after IV injection. Moreover, in the breast tumor model, nanoparticle accumulation is rapidly observed (5h post injection with a ratio tumor / muscle of 3.5), likely due to the Enhanced Permeability and Retention (EPR) effect [3]. Non toxic biocompatible Lipidots® are promising nanovectors for application to imaging and drug delivery. Work is now under way to actively target tumours with Lipidots® functionalized with various peptide.

Biography

Juliette Mérian is a PhD student at the CEA in the Technologies for Biology and Healthcare Division (DTBS) laboratory in Grenoble and Frederic Joliot Hospital Service (SHFJ) in Orsay. She is working on the development of bimodal nanoparticles for Positon Emission Tomography (PET) and fluorescence imaging. Her first work was the achievement characterization of Lipidots® behavior in mice.