



# Treatment of 9L Gliosarcoma in Rats by Ferrociphenol-Loaded Lipid Nanocapsules Based on a Passive Targeting Strategy via the EPR Effect

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**PURPOSE:**

To study a passive targeting strategy, via the enhanced permeability and retention effect following systemic administration of lipid nanocapsules (LNCs) loaded with ferrociphenol, FcdiOH.

**METHODS:**

Long chains of polyethylene glycol (DSPE-mPEG2000) were incorporated onto the surface of LNCs by post-insertion technique. Stealth properties of LNCs were investigated by in vitro complement consumption and macrophage uptake, and in vivo pharmacokinetics in healthy rats. Antitumour effect of FcdiOH-loaded LNCs was evaluated in subcutaneous and intracranial 9L gliosarcoma rat models.

**RESULTS:**

LNCs and DSPE-mPEG2000-LNCs presented low complement activation and weak macrophage uptake. DSPE-mPEG2000-LNCs exhibited prolonged half-life and extended area under the curve in healthy rats. In a subcutaneous gliosarcoma model, a single intravenous injection of FcdiOH-LNCs (400 µL, 2.4 mg/rat) considerably inhibited tumour growth when compared to the control. DSPE-mPEG2000-FcdiOH-LNCs exhibited a strong antitumour effect by nearly eradicating the tumour by the end of the study. In intracranial gliosarcoma model, treatment with DSPE-mPEG2000-FcdiOH-LNCs and FcdiOH-LNCs statistically improved median survival time (28 and 27.5 days, respectively) compared to the control (25 days).

**CONCLUSION:**

These results demonstrate the interesting perspectives for the systemic treatment of glioma thanks to bio-organometallic chemotherapy via lipid nanocapsules.

Résumé en anglais

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