

# Combination of stealth ferrocifen LNCs and standard chemotherapies: a promising treatment against multidrug resistant ovarian adenocarcinoma

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Keyword: Ovarian cancer, Ferrocifen, Lipid nanocapsule

## Abstract

Ovarian cancer is one of the deadliest epithelial malignancies in women because of multidrug resistances affecting the success of traditional chemotherapies like carboplatin and paclitaxel [1]. High grade serous ovarian carcinoma (HGSOV) can be classified in two subtypes, the High OXPHOS tumor that is chemosensitive, and the Low OXPHOS tumor that is chemoresistant [2]. The difference of sensitivity could come from the redox status of these tumors. Ferrocifens, bio-organometallic compounds, are considered as ROS producers with good cytotoxicity on multi-drug resistant cancer cell lines like ovarian cancer [3]. Nevertheless, to be administered *in vivo*, nanocarriers as the lipid nanocapsules (LNCs) are needed because of their hydrophobic nature [3]. The aim of this study was to evaluate the *in vivo* efficiency of ferrocifen lipid nanocapsules (LNCs) on a Low OXPHOS ovarian cancer Patient-Derived-Xenograft (PDX) model, alone or in combination to standard chemotherapies (carboplatin and paclitaxel). Concretely, two ferrocifens, P53 and P722, were encapsulated into 50 nm monodisperse LNCs. The surface of LNCs was decorated with a PEGylated phospholipid, DSPE-PEG<sub>2000</sub>, in order to confer stealth properties to the nanovectors. Stealth P722 LNCs in combination with chemotherapies showed higher tumor reduction than the combination with stealth P53 LNCs on a Low OXPHOS model compared to standard chemotherapies (54 % of variation and 29 % of variation respectively). These results showed that combining standard chemotherapies, carboplatin and paclitaxel, with stealth P722 LNCs could be a promising approach to treat resistant ovarian adenocarcinoma compared to chemotherapies alone.

## References

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