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Antagonist G-Labeled Long Circulating Liposomes Actively Targeted to Lung Tumor Cells

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Introduction:

One of the most promising approaches for anticancer therapy is the design of drug delivery systems specifically targeted to tumor cells. Among them, the construction of liposomes sterically stabilized with PEG (LCL) together with the addition of targeting molecules for selective cellular delivery of these particles is particularly promising. Previous work has shown that many small cell lung cancer (SCLC) cell lines, such as the H69, express receptors for the neuropeptide antagonist G.

Aims:

Study the ability of antagonist G as a ligand at the surface of long circulating liposomes (LCL), i.e. liposomes sterically stabilized with polyethylene glycol (PEG), to selectivity improve their internalization into cells of the human small cell lung cancer (SCLC) H69 cell line.

Methods:

Antagonist G-targeted LCL were prepared by direct and post-insertion methods, where antagonist G was covalently linked to pre-formed liposomes or to DSPE-PEG_{2000}-maleimide micelles and then inserted into the liposomes. The size, zeta potential and antagonist G/lipid ratio of neutral and cationic liposomes were characterized. To study the in vitro internalization in the H69 cell line, targeted and non-targeted LCL were labelled with PE-Rhodamine B and the fluorescent intensity was observed by fluorescence microscopy.

Results:

The conjugation of antagonist G did not affect the characteristics of LCL and targeted LCL prepared by both methods were more internalized by H69 cells than LCL, independently of being neutral or cationic liposomes.

Conclusions:

The enhanced internalization promoted by antagonist G indicates a potential use of antagonist G-targeted LCL as a selective vehicle for drug delivery in the treatment of SCLC.

Keywords:
Active targeting, small cell lung cancer, long circulating liposomes, antagonist G