In vivo toxicity of cationic micelles and liposomes

This study investigated toxicity of nanocarriers comprised of cationic polymer and lipid components often used in gene and drug delivery, formulated as cationic micelles and liposomes. Rats were injected intravenously with 10, 25 or 100 mg/kg and sacrificed after 24 or 48 h, or 24 h after the last of three intravenous injections of 100 mg/kg every other day. Histological evaluation of liver, lung and spleen, clinical chemistry parameters, and hematology indicated little effect of treatment. DNA strand breaks were increased in the lung and spleen. Further, in the dose response study we found unaltered expression levels of genes in the antioxidant response (HMOX1) and repair of oxidized nucleobases (OGG1), whereas expression levels of cytokines (IL6, CXCL2 and CCL2) were elevated in lung, spleen or liver. The results indicate that assessment of genotoxicity and gene expression add information on toxicity of nanocarriers, which is not obtained by histology and hematology.

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