DELIVERY OF LIPOSOMAL FATTY ACID BINDING PROTEIN 4 SIRNA FOR THE TREATMENT OF Atherosclerosis in Apolipoprotein E-Deficient Mice

Poster Contributions
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Background: Fatty acid binding protein 4 (FABP4) deficiency protects apolipoprotein E-deficient (ApoE-/-) mice against developing atherosclerosis, suggesting that FABP4 may be a potential drug target for treating atherosclerosis.

Methods: We developed a liposomal siRNA delivery system for silencing FABP4 as a potential treatment for atherosclerosis. We analyzed the short-term distribution of liposomal FABP4 siRNA and the expression of FABP4 in aortic atherosclerotic tissues of ApoE-/- mice. Liposomal siRNAs were prepared by using the thin-film hydration method and were labeled with quantum dots (QD). ApoE-/- mice were intravenously injected twice in 1 week with either liposomal control siRNA-QD or liposomal FABP4 siRNA-QD. Mouse aortas were harvested, and we used immunofluorescence staining to analyze the distribution of liposomal siRNA. The expression of FABP4 was examined by using immunohistochemical staining.

Results: Immunofluorescence staining of ApoE-/- mouse aortas showed the successful uptake of fluorescently labeled liposomal siRNA into atherosclerotic plaque and the colocalization of these liposomes with FABP4. Additionally, liposomal FABP4 siRNA significantly reduced FABP4 expression in atherosclerotic plaques as compared with liposomal control siRNA (Figure).

Conclusion: The intravenous injection of liposomal FABP4 siRNA silences FABP4 expression in the aortas of ApoE-/- mice and may protect against the development of atherosclerosis.