11th International Conference
on Advanced Materials

Rio de Janeiro Brazil
September 20 - 25

ICAM2009

Cellular Pharmacokinetic of PEG-Stabilized Antisense Nanoliposomes

S.S. Abolmaali[1], A.M. Tamaddon[1, 2] *, F.H. Shirazi[2], H.R. Moghimi[2]

[1] Pharmaceutical Nanotech Lab, Department of Pharmaceutics, Shiraz School of Pharmacy and Pharmaceutical Research Center, Shiraz University (Medical Sciences), Shiraz, Iran.
[2] Department of Pharmaceutics, School of Pharmacy, Shaheed-Beheshti Medical University, Tehran, Iran.
* Corresponding author: amtamadon@sums.ac.ir, Tel/Fax: (98) 711 623-4014

Antisense oligonucleotides (AsON), short pieces of synthetic and chemically-modified DNA, are promising therapeutic molecules designed to inhibit cellular gene expression specifically. Nanovectors viz. cationic liposomes have been developed to promote the biological activity of AsONs hindered by rapid clearance and poor cellular uptake. We aimed to determine membrane binding and cellular association of cationic nanoliposomes. FITC-tagged AsON was actively encapsulated using pH-gradient method in 40% ethanol destabilized DODAP liposomes containing PEG-Cer_{20}. Rate and affinity constants of cellular binding and association were studied in A549 cells by flow cytometry and epi-fluorescence microscopy. Nanoliposomes were characterized 108 nm with 73% encapsulation efficiency. Cellular binding was saturable, time and concentration dependent. Two binding sites were recognized for membrane binding from a Scatchard plot with K_d of 0.1 and 4.8 μM. $T_{1/2}$ of cellular uptake and transfection yield were calculated 1.1h and 78.9% ± 4.5%.