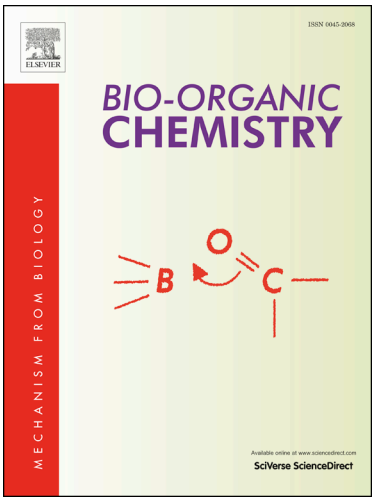

α-Tocopherol-ascorbic acid hybrid antioxidant based cationic amphiphile for gene delivery: Design, Synthesis and transfection

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α-Tocopherol-ascorbic acid hybrid antioxidant based cationic amphiphile for gene delivery: Design, Synthesis and transfection

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ABSTRACT:

Natural antioxidants and vitamins have potential to protect biological systems from peroxidative damage induced by peroxyl radicals, α-tocopherol (Vitamin E, lipid soluble) and ascorbic acid (vitamin C, water soluble), well known natural antioxidant molecules. In the present study we described the synthesis and biological evaluation of hybrid of these two natural antioxidants with each other *via* ammonium di-ethylether linker, **Toc-As** in gene delivery. Two control cationic lipids **N14-As** and **Toc-NOH** are designed in such a way that one is with ascorbic acid moiety and no tocopherol moiety; another is with tocopherol moiety and no ascorbic acid moiety respectively. All the three cationic lipids can form self-assembled aggregates. The antioxidant efficiencies of the three lipids were compared with free ascorbic acid. The cationic lipids (**Toc-As**, **N14-As** and **Toc-NOH**) were formulated individually with a well-known fusogenic co-lipid DOPE and characterization studies such as DNA binding, heparin displacement, size, charge, circular dichroism were performed. The biological characterization studies such as cell viability assay and *in vitro* transfection studies were carried out with the above formulations in HepG2, Neuro-2a, CHO andHEK-293T cell