New Polyamines Phosphoramidate Vectors for Gene Therapy

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DNA delivery into cells can be achieved by using synthetic vectors that compact DNA forming a cationic lipoplex that can interact with cell membrane by electrostatics interactions. The next step will consists to liberate the plasmid DNA into the cyctoplasm followed by its migration up to perinuclear region and finally across the nuclear membrane. Finally, it migrates to the nucleus where it penetrates via the nuclear pores or during the mitosis. The chemical structure of the synthetic vectors can be classified into two categories: cationic polymers (PEI ...) and cationic lipids. In our group, cationic lipids possessing structure inspired from phospholipids present into membranes have been synthesized and tested for in vivo and in vitro essays.[1,2,3] Of note, many cationic polymers (e.g., PEI) or cationic lipids (DOGS, DPPES, DOSPA), identified by their transfection efficiency, are characterised by the presence of several amino functional groups on their backbone. We attempt the synthesis of cationic lipids having a phosphoramidate lipidic moiety and a polyamino polar headgroup. For this study, the polar headgroup is formed by the spermine as depicted below.

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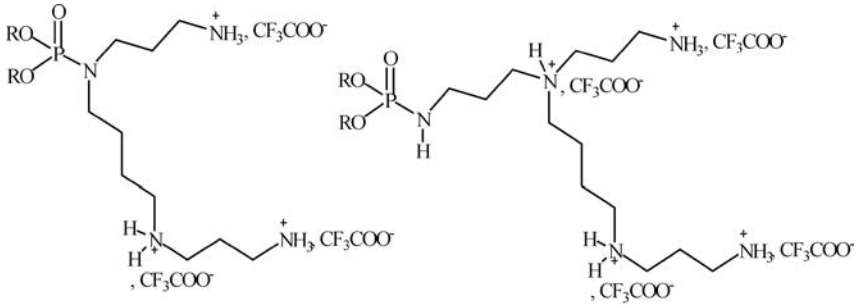

R= $C_{14}H_{29}$ or $C_{18}H_{35}$

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