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Polyammonium derivatives of (thia)calix[4]arene: Synthesis and interaction with nucleic acids

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Abstract

© 2015 Nova Science Publishers, Inc. Targeted delivery of polynucleic acids in cells (transfection) for therapeutic purposes is limited by a number of obstacles, starting from the cell membrane to the gene expression. To overcome the cell barriers, the use of gene carriers - viral and non-viral vectors are employed. One of the current approaches employed in the development of synthetic nonviral vectors is the functionalization of easily accessible molecular platforms with receptor groups (amino, ammonium or guanidinium groups), capable of interacting with nucleic acids. In this chapter, we examine recent advances in the design and development of synthetic vectors, and the principles underlying their interactions with nucleic acids. The focus will be on recent advances in the design and synthesis of potential transfection agents based on the (thia)calixarene platform functionalized with different polyamino fragments differing in the number of amino groups, the length of their alkyl linker chains and the present or absent of hydroxy groups. The interaction of functionalized (thia)calixarene derivatives with DNA will also be discussed.

Keywords

(Thia)Calixarenes, DNA, Oligoamines, Synthesis, Transfection