

N^4 -acyl-2-deoxycytidine-5-triphosphates for the enzymatic synthesis of modified DNA

PURPOSE

Novel N^4 -acylated deoxycytidine nucleotides as beneficial substrates for screening of enzymes, the enzymatic synthesis of modified DNA, which can be further applied for specific labelling of DNA fragments, selection of aptamers or photoimmobilization.

BRIEF DESCRIPTION OF THE TECHNOLOGY

The newly developed method on N^4 -modified nucleotides relates generally to the field of nucleic acid chemistry, specifically to N^4 -position modified cytidine triphosphates. It also relates to methods of making and using the same. The invention includes the use of the modified nucleotides for the synthesis of modified product, which can be an oligonucleotide, double- or single-stranded DNA or RNA fragment, or an aptamer. The technology is based on the idea of using N^4 -modified cytidine triphosphates for the biosynthesis and application of modified nucleic acids. The present idea of biosynthesis and application of modified nucleic acids covers synthesis, modification and application of nucleic acid molecule comprising at least one cytosine nucleobase modification of the compounds. In summary novel N^4 -modified nucleotides significantly expand the toolbox for the enzymatic synthesis of modified nucleic acids.

TECHNOLOGY READINESS LEVEL

Validated in laboratory.

INTELLECTUAL PROPERTY

USPTO patent application (#16646593) and EPO patent application (#18779053) on the method of N^4 -modified cytidine nucleotides filed. Applicant: Vilnius University (Lithuania).

INVENTORS

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PUBLICATIONS

Jakubovska, J., Tauraitė, D., Birštonas, L., Meškys, R. N^4 -acyl-2-deoxycytidine-5-triphosphates for the enzymatic synthesis of modified DNA. *Nucleic Acids Research*, 2018, Vol. 46, No. 12 5911–5923.



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FIELDS OF APPLICATION

- molecular biology,
- biotechnology,
- synthetic biology,
- medicine,
- clinical diagnostics,
- pharmacy.

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