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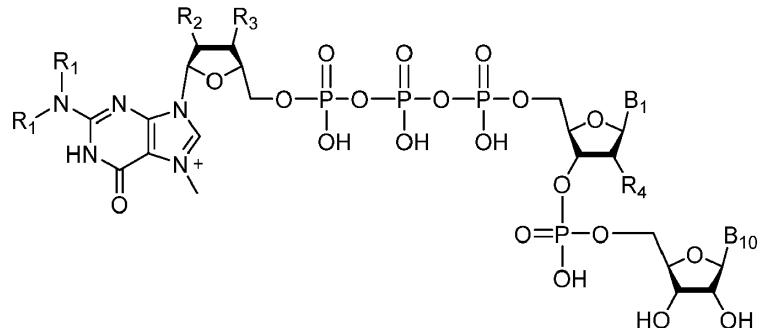
(54)	Title	INITIATING CAPPED OLIGONUCLEOTIDE PRIMERS FOR SYNTHESIZING 5'-CAPPED RNAs
(56)	References Cited:	WO-A2-2009/058911 WO-A2-2008/016473 I. I. KOUKHAREVA ET AL: "Chemical Route to the Capped RNAs", NUCLEOSIDES, NUCLEOTIDES AND NUCLEIC ACIDS., vol. 23, no. 10, 1 January 2004 (2004-01-01), pages 1667-1680, XP055553747, US ISSN: 1525-7770, DOI: 10.1081/NCN-200031492 ROBERT E. SMITH ET AL: "A Unique Class of Compound, Guanosine-Nucleoside Tetraphosphate G(5')pppp(5')N, Synthesized during the in Vitro Transcription of Cytoplasmic Polyhedrosis Virus of Bombyx mori STRUCTURAL DETERMINATION AND MECHANISM OF FORMATION**", THE JOURNAL OF BIOLOGICAL CHEMISTRY, vol. 257, no. 1, 1 January 1982 (1982-01-01), pages 485-494, XP055331398,

- M. Ishikawa ET AL: "Preparation of eukaryotic mRNA having differently methylated adenosine at the 5'-terminus and the effect of the methyl group in translation", Nucleic Acids Symposium Series, vol. 53, no. 1, 1 September 2009 (2009-09-01), pages 129-130, XP055331388, GB ISSN: 0261-3166, DOI: 10.1093/nass/nrp065
- Y. THILLIER ET AL: "Synthesis of 5' cap-0 and cap-1 RNAs using solid-phase chemistry coupled with enzymatic methylation by human (guanine-N7)-methyl transferase", RNA, vol. 18, no. 4, 14 February 2012 (2012-02-14), pages 856-868, XP055553150, US ISSN: 1355-8382, DOI: 10.1261/rna.030932.111
- HIROAKI SAWAI ET AL: "Synthesis and Reactions of Nucleoside 5'-Diphosphate Imidazolide. A Nonenzymatic Capping Agent for 5'-Monophosphorylated Oligoribonucleotides in Aqueous Solution", JOURNAL OF ORGANIC CHEMISTRY, vol. 64, no. 16, 1 August 1999 (1999-08-01), pages 5836-5840, XP055331109, ISSN: 0022-3263, DOI: 10.1021/jo990286u

Enclosed is a translation of the patent claims in Norwegian. Please note that as per the Norwegian Patents Acts, section 66i the patent will receive protection in Norway only as far as there is agreement between the translation and the language of the application/patent granted at the EPO. In matters concerning the validity of the patent, language of the application/patent granted at the EPO will be used as the basis for the decision. The patent documents published by the EPO are available through Espacenet (<http://worldwide.espacenet.com>) or via the search engine on our website here: <https://search.patentstyret.no/>

Patentkrav

1. Forbindelse med den følgende struktur:



hvor:

- 5 B₁ og B₁₀ uavhengig av hverandre er en naturlig nukleosidbase;
 R₁ er H eller methyl;
 R₂ er H, OH, alkyl, O-alkyl eller halogen;
 R₃ er O-alkyl; og
 R₄ er H, OH eller O-metyl.

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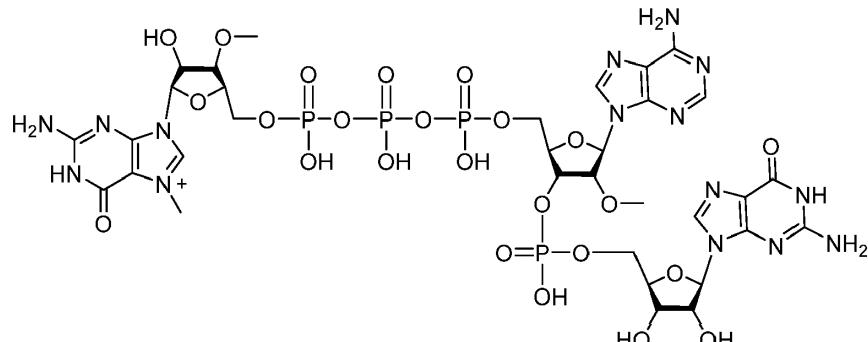
2. Forbindelse ifølge krav 1, hvor R₃ er O-metyl.

3. Forbindelse ifølge krav 1, hvor B₁ er adenin, guanin, N⁶-metyladenin, cytosin eller uracil.

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4. Forbindelse ifølge krav 1, hvor B₁₀ er adenin, guanin, N⁶-metyladenin, cytosin eller uracil.

5. Forbindelse ifølge krav 1, som har strukturen:



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6. Forbindelse ifølge et hvilket som helst av kravene 1 til 5, hvor forbindelsen er en initierende capped oligonukleotidprimer.

7. Initierende capped oligonukleotidprimer ifølge krav 6, valgt

- 5 blant $m^7G_{3'Om}e$ pppApA, $m^7G_{3'Om}e$ pppApC, $m^7G_{3'Om}e$ pppApG, $m^7G_{3'Om}e$ pppApU,
 $m^7G_{3'Om}e$ pppCpA, $m^7G_{3'Om}e$ pppCpC, $m^7G_{3'Om}e$ pppCpG, $m^7G_{3'Om}e$ pppCpU,
 $m^7G_{3'Om}e$ pppUpA, $m^7G_{3'Om}e$ pppUpC, $m^7G_{3'Om}e$ pppUpG, $m^7G_{3'Om}e$ pppUpU,
 $m^7G_{3'Om}e$ pppA_{2'Om}e pA, $m^7G_{3'Om}e$ pppA_{2'Om}e pC, $m^7G_{3'Om}e$ pppA_{2'Om}e pG,
 $m^7G_{3'Om}e$ pppA_{2'Om}e pU, $m^7G_{3'Om}e$ pppC_{2'Om}e pA, $m^7G_{3'Om}e$ pppC_{2'Om}e pC,
10 $m^7G_{3'Om}e$ pppC_{2'Om}e pG, $m^7G_{3'Om}e$ pppC_{2'Om}e pU, $m^7G_{3'Om}e$ pppU_{2'Om}e pA,
 $m^7G_{3'Om}e$ pppU_{2'Om}e pC, $m^7G_{3'Om}e$ pppU_{2'Om}e pG og $m^7G_{3'Om}e$ pppU_{2'Om}e pU.

8. RNA-molekyl som omfatter den initierende capped oligonukleotidprimer ifølge krav 6 eller krav 7.

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9. Celle som inneholder et RNA-molekyl som omfatter den initierende capped oligonukleotidprimer ifølge krav 6 eller krav 7.

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10. Fremgangsmåte for fremstilling av en celle som inneholder et protein som er translatert fra et RNA-molekyl, omfattende den initierende capped oligonukleotidprimer ifølge krav 6 eller krav 7, omfattende innføring av nevnte RNA-molekyl som inneholder den initierende capped oligonukleotidprimer, i en celle som benytter nevnte RNA-molekyl for å produsere nevnte protein.

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11. Farmasøytisk sammensetning som omfatter RNA-molekylet ifølge krav 8 og en farmasøytisk aksepterbar bærer.