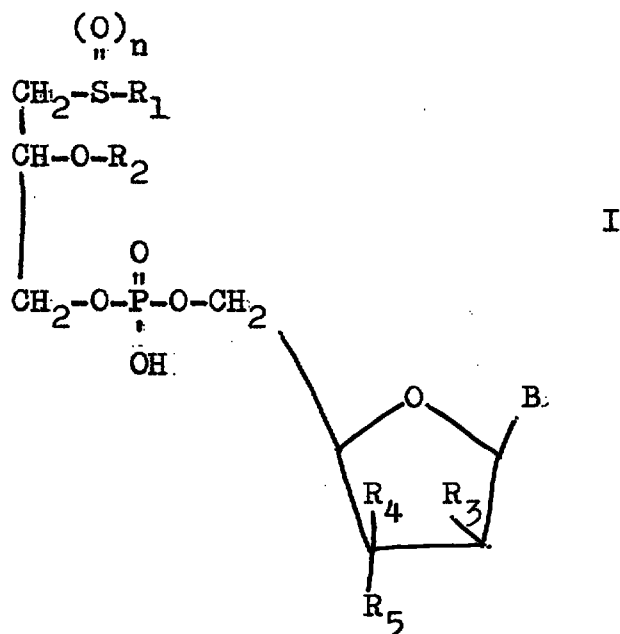
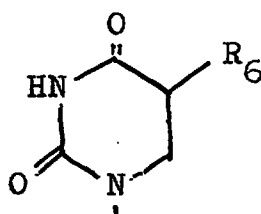


The subject of the present invention are new phospholipid derivatives of nucleosides of the general formula I



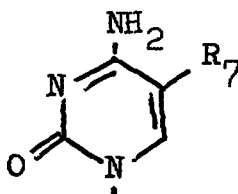
- 5 in which R_1 signifies a straight-chained or branched, saturated or unsaturated alkyl chain with 8 - 15 carbon atoms which can possibly be substituted one or more times by phenyl, halogen, C_1 - C_6 -alkoxy, C_1 - C_6 -alkylmercapto, C_1 - C_6 -alkoxycarbonyl, C_1 - C_6 -alkylsulphanyl or C_1 - C_6 -alkylsulphonyl groups, R_2 a
- 10 straight-chained or branched, saturated or unsaturated alkyl chain with 8 - 15 carbon atoms which can possibly be substituted one or more times by phenyl, halogen, C_1 - C_6 -alkoxy, C_1 - C_6 -alkylmercapto, C_1 - C_6 -alkoxycarbonyl or C_1 - C_6 -alkylsulphonyl groups, R_3
- 15 hydrogen or a hydroxyl group, R_4 , R_5 in each case hydrogen or one of the radicals R_4 and R_5 can represent halogen, a hydroxyl, a cyano or an azido group and, furthermore, R_3 and R_4 can represent a
- 20 further bond between C-2' and C-3', n 0, 1 or 2 and B one of the following compounds:

1.)



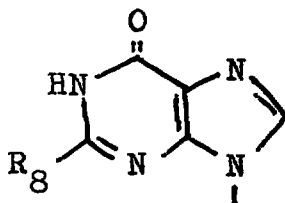
whereby R_6 can be hydrogen, an alkyl chain with 1 - 4 carbon atoms or halogen,

2.)



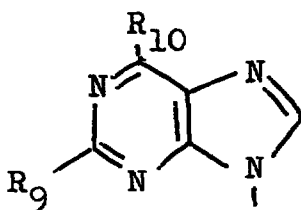
5 whereby R_7 can be hydrogen, an alkyl chain with 1 - 4 carbon atoms or halogen,

3.)



whereby R_8 can be hydrogen, an alkyl chain with 1 - 4 carbon atoms, halogen or a hydroxyl or an amino group

10 4)



whereby R_9 can be hydrogen or an amino group and R_{10} signifies hydrogen, halogen, C_1-C_6 -alkoxy, C_1-C_6 -alkylmercapto or an amino group which can be mono- or disubstituted by C_1-C_6 -alkyl, C_1-C_6 -alkoxy, hydroxy-
15 C_2-C_6 -alkyl and/or C_3-C_6 -cycloalkyl, aryl, hetaryl, aralkyl or hetarylalkyl groups, which can possibly be substituted in the aryl or hetaryl radical by one or more hydroxyl, methoxy or alkyl groups or halogen, or allyl, which can possibly be substituted by mono- or dialkyl or alkoxy groups,

their tautomers and their physiologically acceptable salts of inorganic and organic acids and bases, as well as processes for their preparation and medicaments containing these compounds.

5 Since the compounds of the general formula I contain asymmetric carbon atoms, all optically-active forms and racemic mixtures of these compounds are also the subject of the present invention.

10 In J. Biol. Chem., 265, 6112 (1990) is described the preparation and use of liponucleotides as anti-viral medicaments. However, there were here only investigated and synthesised the dimyristoylphosphatidyl and dipalmitoylphosphatidyl radicals coupled with their fatty acid ester structure to known nucleosides,
15 such as e.g. AZT and ddC.

 In J. Med. Chem., 33, 1380 (1990) are described nucleoside conjugates of thioether lipids with cytidine diphosphate which display an anti-tumour action and could find used in oncology.

20 In Chem. Pharm. Bull., 36, 209 (1988) are described 5'-(3-SN-phosphatidyl)-nucleosides with anti-leukaemic activity, as well as their enzymatic synthesis from the corresponding nucleosides and phosphocholines in the presence of phospholipase D
25 with transferase activity.

 The enzymatic synthesis of liponucleotides is also described, inter alia, in Tetrahedron Lett., 28, 199 (1987) and in Chem. Pharm. Bull., 36, 5020 (1988).

30 The compounds of the present invention also display valuable pharmacological properties. In particular, they are suitable for the therapy and prophylaxis of infections which have been caused by DNA viruses, such as e.g. the herpes simplex virus, the cytomegalovirus, Papovaviruses, the varicella zoster virus or Epstein-
35 Barr virus, or by RNA viruses, such as togaviruses, or especially retroviruses, such as the oncoviruses HTLV I and II, as well as the lentiviruses visna and human immune deficiency virus HIV-1 and HIV-2.

The compounds of the formula I appear to be especially suitable for the treatment of the clinical manifestations of the retroviral HIV infections in humans, such as persistent generalised lymphadenopathy (PGL), the advanced stage of the AIDS-related complex (ARC) and the clinically complete picture of AIDS.

Surprisingly, it has now been found that compounds of the general formula I inhibit the multiplication of DNA and RNA viruses at the stage of the virus-specific DNA and RNA transcription. The substances can influence the multiplication of retroviruses via the inhibition of the enzyme reverse transcriptase (cf. Proc. Natl. Acad. Sci. USA, 83, 1911, 1986 and Nature, 325, 773, 1987). Of especial therapeutic interest is the inhibiting action on the HIV, the cause of the immune deficiency disease AIDS. At the present time, for the treatment of AIDS only 3'-azido-3'-desoxythymidine (DE-A-36 08 606) is permitted in the case of AIDS patients. However, toxic side effects of 3'-azido-3'-desoxythymidine on the bone marrow in the case of about 50% of the treated patients make blood transfusions necessary. The compounds of the general formula I do not possess these disadvantages. They act anti-virally without being cytotoxic in pharmacologically relevant doses.

The compounds of the present invention and their pharmaceutical preparations can also be used in combination with other medicaments for the treatment and prophylaxis of the above-mentioned infections. Examples of these agents containing further medicaments, which can be used for the treatment and prophylaxis of HIV infections or of diseases accompanying this disease are such as 3'-azido-3'-desoxythymidine, 2',3'-didesoxynucleosides, such as e.g. 2',3'-didesoxycytidine, 2',3'-didesoxyadenosine and 2',3'-didesoxyinosine, acyclic nucleosides (e.g. acyclovir), interferons, such as e.g. A-interferon,

renal excretion inhibitors, such as e.g. probenecid, nucleoside transport inhibitors, such as e.g. dipyridamol, as well as immune modulators, such as e.g. interleukin II, or stimulations factors, such as e.g. the granulocyte macrophage colony factor. The compounds of the present invention and the other medicaments can each be administered in a single or two separate formulations or can be administered at different times so that a synergistic effect is achieved.

As possible salts of the compounds of the general formula I, there come into question above all alkali metal, alkaline earth metal and ammonium salts of the phosphate group. As alkali metal salts, lithium, sodium and potassium salts are preferred. As alkaline earth metal salts, there come into question especially magnesium and calcium salts. By ammonium salts, according to the invention are understood salts which contain the ammonium ion which can be substituted up to four times by alkyl radicals with 1 - 4 carbon atoms and/or aralkyl radicals, preferably benzyl radicals. The substituents can hereby be the same or different.

The compounds of the general formula I can contain basic groups, especially amino groups, which can be converted with suitable acids into acid-addition salts. As acids herefor, there come into consideration for example: hydrochloric acid, hydrobromic acid, sulphuric acid, phosphoric acid, fumaric acid, succinic acid, tartaric acid, citric acid, lactic acid, maleic acid or methanesulphonic acid.

In the general formula I, R_1 preferably signifies a straight-chained C_{10} - C_{14} -alkyl group which can also be substituted by a C_1 - C_6 -alkoxy or a C_1 - C_6 -alkylmercapto group. In particular, R_1 represents a decyl, undecyl, dodecyl, tridecyl or tetradecyl radical. As C_1 - C_6 -alkoxy substituents of R_1 , there preferably come into question the methoxy, ethoxy,

butoxy and the hexyloxy groups. If R_1 is substituted by a C_1-C_6 -alkylmercapto radical, one understands thereunder the methylmercapto, ethylmercapto, propylmercapto, butylmercapto and the hexylmercapto radical and n one of the numbers 0, 1 or 2.

R_2 preferably signifies a straight-chained $C_{10}-C_{14}$ -alkoxy group or a C_1-C_6 -alkylmercapto group. In particular, R_2 represents a decyl, undecyl, dodecyl, tridecyl or tetradecyl group. As C_1-C_6 -alkoxy substituents of R_2 , there preferably come into question the methoxy, ethoxy, propoxy, butoxy and the hexyloxy group.

If R_2 is substituted by a C_1-C_6 -alkylmercapto radical, one understands thereunder especially the methylmercapto, ethylmercapto, butylmercapto and hexylmercapto radical.

R_4 and R_5 preferably signify in each case hydrogen or one of the two radicals is preferably a cyano or azido group or a halogen atom, such as fluorine, chlorine, bromine or iodine.

Especially preferred are compounds in which R_3 and R_4 represent a hydrogen atom and R_5 cyano, azido or fluorine or R_5 is hydrogen and R_3/R_4 represent a further bond between C-2' and C-3'.

In the bases B of the general formula I, the radicals R_6 and R_7 , respectively, preferably signify a hydrogen atom, a methyl, ethyl, propyl or butyl radical or a halogen atom, such as fluorine, chlorine, bromine or iodine. Especially preferred for R_6 or R_7 , respectively, is a hydrogen atom, the methyl or ethyl radical or a chlorine or bromine atom.

The radical R_8 is preferably a hydrogen atom, a methyl, ethyl, propyl or butyl radical, an amino group or a halogen atom, such as a fluorine, chlorine, bromine or iodine atom, preferably chlorine or bromine.

R_{10} preferably signifies a hydrogen, fluorine, chlorine or bromine atom, a C_1-C_6 -alkoxy group,

especially a methoxy, ethoxy, propoxy, butoxy or
hexyloxy group, a C_1-C_6 -alkylmercapto group,
especially a methylmercapto, ethylmercapto, butyl-
mercapto or hexylmercapto group, or an amino group
5 which can be mono- or disubstituted by a C_1-C_6 -alkyl
group, such as e.g. the methyl, ethyl, butyl or hexyl
group, by a hydroxy- C_2-C_6 -alkyl group, such as e.g.
the hydroxyethyl, hydroxypropyl, hydroxybutyl or
hydroxyhexyl group, by a C_3-C_6 -cycloalkyl radical,
10 such as e.g. the cyclopropyl, cyclopentyl or cyclo-
hexyl radical, by aryl, preferably phenyl, by an
aralkyl radical, such as especially benzyl, which can
possibly also be substituted by one or more hydroxyl
or methoxy groups, by C_1-C_6 -alkyl groups, such as
15 e.g. the methyl, ethyl, propyl, butyl or hexyl group,
or by halogen atoms, such as fluorine, chlorine or
bromine. The amino group can also be substituted by
a hetarylalkyl or hetaryl radical, such as especially
the thienyl, the furyl or the pyridyl radical. By the
20 hetarylalkyl radical one preferably understands the
thienylmethyl, furylmethyl or pyridylmethyl radical.

Preferred coupled nucleosides in the claimed lipo-
nucleotides of the general formula I are:

- 2',3'-didesoxy-3'-azidouridine
- 25 -2',3'-didesoxyinosine
- 2',3'-didesoxyguanosine
- 2',3'-didesoxycytidine
- 2',3'-didesoxyadenosine
- 3'-desoxythymidine
- 30 -2',3'-didesoxy-2',3'-didehydro- N^6 -(o-methylbenzyl)-
adenosine
- 2',3'-didesoxy-2',3'-didehydro- N^6 -(2-methylpropyl)-
adenosine
- 2',3'-didesoxy-3'-azidoguanosine
- 35 -2',3'-didesoxy-3'-fluoro-5-chlorouridine
- 3'-desoxy-3'-fluorothymidine
- 2',3'-didesoxy-3'-fluoroadenosine
- 2',3'-didesoxy-2',3'-didehydrocytidine

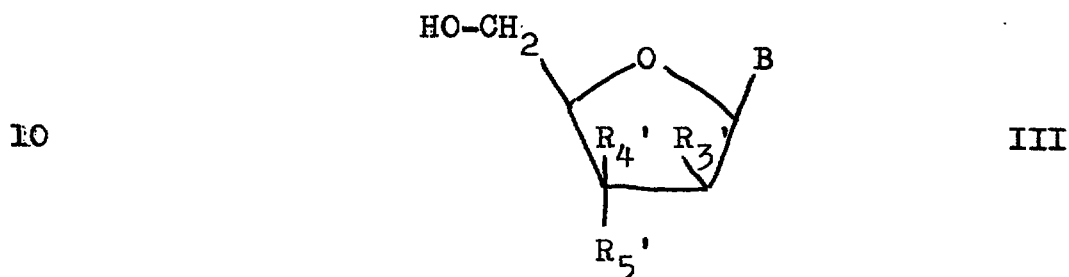
-3'-desoxy-2',3'-didehydrothymidine
 -3'-desoxy-3'-azidothymidine
 -2',3'-didesoxy-3'-fluoro-2,6-diaminopurine-riboside.

The compounds of the general formula I can be
 5 prepared in that one

1. brings a compound of the general formula II

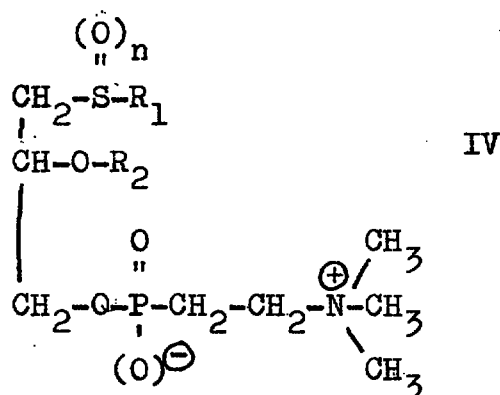


in which R_1 , R_2 and n possess the given meanings, to
 reaction with a compound of the general formula III



in which R_3' represents hydrogen or a hydroxyl group
 protected by an oxygen protective group conventional
 to the expert and R_4' and R_5' in each case signify
 hydrogen, halogen, an azido, a cyano group or one of
 15 the radicals R_4' and R_5' signify a hydroxyl group
 protected by an oxygen protective group conventional
 to the expert or R_3' and R_4' represent a further bond
 and B possesses the given meanings, in the presence of
 phosphorus oxytrichloride and of a phosphoric acid
 20 ester and of a tertiary nitrogen base, e.g. pyridine
 or triethylamine, in an inert solvent, such as
 e.g. toluene, and, after hydrolysis has taken place,
 possibly splits off the oxygen protective group
 according to the processes usual in nucleoside
 25 chemistry; or

2. brings a compound of the general formula IV



in which R_1 , R_2 and n possess the above-given meanings, to reaction with a compound of the general formula III, in which R_3' , R_4' , R_5' and B possess the given meanings, 5 in the presence of phospholipase D in an inert solvent, such as e.g. chloroform, and in the presence of a suitable buffer and, after reaction has taken place, possibly splits off the oxygen protective groups by processes usual in nucleoside chemistry.

10 The preparation of the compounds of the general formulae II and IV are described in Lipids, 22, 947 (1987) and in DE-A-30 39 629.

The preparation of the compounds of the general formula III are described e.g. in EP-A-0 286 028 and 15 WO 90/08147.

Compounds similar to general formula I are described in EP-A-0 350 287. However, only 1,2-di- esters of glycerol are there described.

The medicaments containing compounds of the formula 20 I for the treatment of viral infections can be administered enterally or parenterally in liquid or solid form. The usual forms of administration hereby come into question, such as tablets, capsules, dragees, syrups, solutions or suspensions. As injection medium, 25 water is preferably used which contains the additives usual in the case of injection solutions, such as stabilising agents, solubilising agents and buffers. Such additives are e.g. tartrate and citrate buffers, ethanol, complex formers, such as ethylenediamine- 30 tetraacetic acid and its non-toxic salts, high

molecular polymers, such as liquid polyethylene oxide, for viscosity regulation. Liquid carrier materials for injection solutions must be sterile and are preferably filled into ampoules. Solid carrier materials are, for example, starch, lactose, mannitol, methyl cellulose, talc, highly dispersed silicic acids, high molecular fatty acids, such as stearic acid, gelatine, agar-agar, calcium phosphate, magnesium stearate, animal and vegetable fats, solid high molecular polymers, such as polyethylene glycol, etc. Compositions suitable for oral administration can, if desired, contain flavouring or sweetening agents.

The dosage can depend upon various factors, such as manner of administration, species or individual state of health. The compounds according to the invention are usually administered in amounts of 0.1 - 100 mg, preferably 0.2 - 80 mg per day and per kg of body weight. It is preferred to divide up the daily dose into 2 - 5 administrations, whereby, in the case of each administration, 1 - 2 tablets with an active material content of 0.5 - 500 mg are administered. The tablets can also be retarded, whereby the number of administrations is reduced to 1 - 3 per day. The active material can also be given by continuous infusion, whereby the amounts of from 5 - 1000 mg per day normally suffice.

Apart from the compounds mentioned in the Examples and those derived by combination of all meanings of the substituents mentioned in the claims, the following compounds also come into question in the meaning of the present invention:

1. (2',3'-dideoxy-3'-fluoro-5-chlorouridine)-5'-phosphoric acid (3-dodecylmercapto-2-decyloxy)-propyl ester
2. (3'-desoxy-3'-azidothymidine)-5'-phosphoric acid (3-dodecylsulphinyl-2-decyloxy)-propyl ester

3. (3'-desoxy-3'-azidothymidine)-5'-phosphoric acid
(3-dodecylsulphonyl-2-decyloxy)-propyl ester
4. (2',3'-didesoxycytidine)-5'-phosphoric acid (3-
(dodecylmercapto-2-decyloxy)-propyl ester
- 5 5. (2',3'-didesoxyinosine)-5'-phosphoric acid (3-
dodecylmercapto-2-decyloxy)-propyl ester
6. (2',3'-didesoxyguanosine)-5'-phosphoric acid (3-
dodecylmercapto-2-decyloxy)-propyl ester
7. (2',3'-didesoxyadenosine)-5'-phosphoric acid (3-
10 dodecylmercapto-2-decyloxy)-propyl ester
8. (3'-desoxythymidine)-5'-phosphoric acid (3-dodecyl-
mercapto-2-decyloxy)-propyl ester
9. (3'-desoxy-2',3'-didehydrothymidine)-5'-phosphoric
acid (3-dodecylmercapto-2-decyloxy)-propyl ester
- 15 10. (3'-desoxy-3'-fluorothymidine)-5'-phosphoric acid
(3-dodecylmercapto-2-decyloxy)-propyl ester
11. (2',3'-didesoxy-3'-azidoguanosine)-5'-phosphoric
acid (3-dodecylmercapto-2-decyloxy)-propyl ester
12. (2',3'-didesoxy-3'-fluoro-2,6-diaminopurine-
20 riboside)-5'-phosphoric acid (3-dodecylmercapto-
2-decyloxy)-propyl ester
13. (2',3'-didesoxy-2',3'-didehydro-N⁶-(2-methyl-
propyl)-adenosine)-5'-phosphoric acid (3-dodecyl-
mercapto-2-decyloxy)-propyl ester
- 25 14. (2',3'-didesoxy-2',3'-didehydro-N⁶-(o-methyl-
benzyl)-adenosine)-5'-phosphoric acid (3-dodecyl-
mercapto-2-decyloxy)-propyl ester
15. (2',3'-didesoxy-2',3'-didehydrocytidine)-5'-
phosphoric acid (3-decylmercapto-2-dodecyloxy)-
30 propyl ester
16. (2',3'-didesoxy-3'-fluoroadenosine)-5'-phosphoric
acid (3-undecylmercapto-2-dodecyloxy)-propyl ester
17. (2',3'-didesoxy-3'-azidouridine)-5'-phosphoric acid
(3-decylsulphonyl-2-dodecyloxy)-propyl ester
- 35 18. (2',3'-didesoxycytidine)-5'-phosphoric acid (3-
decylmercapto-2-decyloxy)-propyl ester

19. (2',3'-didesoxyinosine)-5'-phosphoric acid (3-dodecylmercapto-2-dodecyloxy)-propyl ester
20. (3'-desoxy-3'-azidothymidine)-5'-phosphoric acid (3-tetradecylmercapto-2-decyloxy)-propyl ester
5 21. (3'-desoxy-3'-azidothymidine)-5'-phosphoric acid (3-pentadecylmercapto-2-decyloxy)-propyl ester
22. (2',3'-didesoxyinosine)-5'-phosphoric acid (3-dodecylmercapto-2-octyloxy)-propyl ester
23. (2',3'-didesoxyinosine)-5'-phosphoric acid (3-dodecylmercapto-2-octyloxy)-propyl ester.
10

Example 1a

(3'-Desoxy-3'-azidothymidine)-5'-phosphoric acid (3-dodecylmercapto-2-decyloxy)-propyl ester

To a solution of 1.25 g (3 mmol) 3-dodecylmercapto-2-decyloxypropan-1-ol and 1.2 ml (8.6 mmol) triethylamine in 40 ml abs. ether were added dropwise at 0°C, under nitrogen, 0.42 ml (4.5 mmol) POCl₃ and after stirred for 45 min. One then allows to warm to RT, adds dropwise thereto a solution of 800 mg (3 mmol) 3'-desoxy-3'-azidothymidine (AZT) in a mixture of 15 ml abs. ether and 20 ml abs. toluene and stirs under reflux for 6 h (TLC monitoring).
15
20

After cooling, 50 ml water were added thereto, the mixture was vigorously stirred for 2 h, the organic phase thereafter separated off, dried over Na₂SO₄ and evaporated on a rotary evaporator. The residue was purified by preparative column chromatography on silica gel 60 with dichloromethane/methanol 9:1 as eluent. Yield 540 mg (24% of theory). M.p. 187°C sinters, 220 - 223°C decomp. with brown coloration; ³¹P-NMR = 0.59 ppm.
25
30

Example 1b

(3'-Desoxy-3'-azidothymidine)-5'-phosphoric acid (3-dodecylmercapto-2-decyloxy)-propyl ester

Analogously to the procedure in Chem. Pharm. Bull. 36, 5020 (1988), 2 mmol AZT and 5000 U phospholipase D were suspended in 4 ml sodium acetate buffer/CaCl₂, mixed with a solution of 6 mmol 3-dodecylmercapto-2-
35

decyloxypropyl-1-phosphoric acid monocholine ester in 160 ml chloroform and heated to 45°C for 8 h. It was then dried over Na₂SO₄ and the solvent removed in a vacuum. The residue was purified by
5 column chromatography as in Example 1a. Yield 51%. The product proved to be identical to the product of Example 1a. (m.p., TLC, ¹H- and ³¹P-NMR).

Example 2

(3'-Desoxy-3'-azidothymidine)-5'-phosphoric acid (3-
10 undecylmercapto-2-undecyloxy)-propyl ester was prepared analogously to Example 1a; yield 27%, m.p. 218 - 222°C (decomp.).

Example 3

/2',3'-Didesoxy-2',3'-didehydro-N⁶-(o-methylbenzyl)-
15 adenosine-5'-phosphoric acid (3-dodecylmercapto-2-
decyloxy)-propyl ester

680 mg (1.37 mmol) phosphoric acid (3-dodecylmercapto-2-decyl)-propyl ester in 20 ml abs. pyridine were mixed with 337 mg (1 mmol) 2',3'-didesoxy-2',3'-
20 didehydro-N⁶-(o-methylbenzyl)-adenosine and, after addition of 1.37 g (6.7 mmol) DCC, stirred for 24 hours at room temperature (TLC monitoring). The pyridine was then removed in a vacuum, the residue suspended in ether and filtered off from undissolved
25 urea. After evaporation of the solvent, the filtrate was purified by column chromatography on silica gel 60 with dichloromethane/methanol 95/5 as eluent.

Yield 220 mg (26% of theory); R_f = 0.68 (CH₂Cl₂/CH₃OH/H₂O 13/5/0.8).

30 Example 4

(3'-Desoxy-3'-azidothymidine)-5'-phosphoric acid (3-
dodecylmercapto-2-decyloxy)-propyl ester

Analogously to Example 3, from 13.5 g phosphoric acid (3-dodecylmercapto-2-decyloxy)-propyl ester,
35 5.4 g AZT and 27 g DCC in 350 ml abs. pyridine, by 30 hours stirring at room temperature and purification as described above, the corresponding lipo-

nucleotide was prepared in 62% yield (analytical data identical with that of Example 1).

Example 5

5 (3'-Desoxythymidine)-5'-phosphoric acid (3-dodecyl-mercapto-3-decyloxy)-propyl ester

Analogously to Example 3, from 1.3 g phosphoric acid (3-dodecylmercapto-2-decyloxy)-propyl ester, 500 mg 3'-desoxythymidine and 2.6 g DCC in 40 ml abs. pyridine, by 24 hours stirring at room temperature and
10 chromatographic purification, there was obtained the corresponding liponucleotide in 51% yield. $R_f = 0.45$ ($\text{CH}_2\text{Cl}_2/\text{CH}_3\text{OH}/\text{H}_2\text{O}$ 12/5/0.8).

Example 6

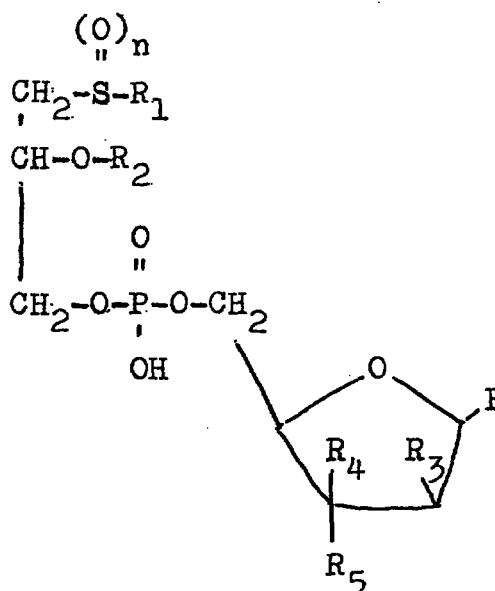
15 (2',3'-Didesoxyinosine)-5'-phosphoric acid (3-dodecyl-mercapto-2-decyloxy)-propyl ester

Analogously to Example 3, from 1.3 g phosphoric acid (3-dodecylmercapto-2-decyloxy)-propyl ester, 500 mg 2',3'-didesoxyinosine and 2.6 g DCC in 40 ml abs. pyridine, by 40 hours stirring at room temper-
20 ature and chromatographic purification, there was prepared the corresponding liponucleotide in 61% yield. $R_f = 0.38$ ($\text{CH}_2\text{Cl}_2/\text{CH}_3\text{OH}/\text{H}_2\text{O}$ 13/5/0.8).



Patent Claims

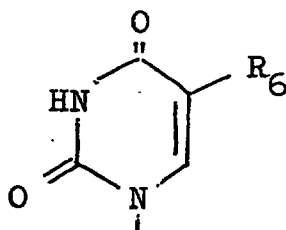
1. Compounds of the general formula I



- in which R_1 signifies a straight-chained or branched, saturated or unsaturated alkyl chain with 8 - 15 carbon atoms which can possibly be substituted one or more times by phenyl, halogen, $\text{C}_1\text{-C}_6$ -alkoxy, $\text{C}_1\text{-C}_6$ -alkylmercapto, $\text{C}_1\text{-C}_6$ -alkoxycarbonyl, $\text{C}_1\text{-C}_6$ -alkylsulphinyl or $\text{C}_1\text{-C}_6$ -alkylsulphonyl groups, R_2 a straight-chained or branched, saturated or unsaturated alkyl chain with 8 - 15 carbon atoms which can possibly be substituted one or more times by phenyl, halogen, $\text{C}_1\text{-C}_6$ -alkoxy, $\text{C}_1\text{-C}_6$ -alkylmercapto, $\text{C}_1\text{-C}_6$ -alkoxycarbonyl or $\text{C}_1\text{-C}_6$ -alkylsulphonyl groups, R_3 hydrogen or a hydroxyl group, R_4 , R_5 in each case hydrogen or one of the substituents R_4 and R_5 halogen, a hydroxyl, a cyano or an azido group and, furthermore, R_3 and R_4 can represent a further bond between C-2' and C-3' , n 0, 1 or 2 and B one of the following compounds:

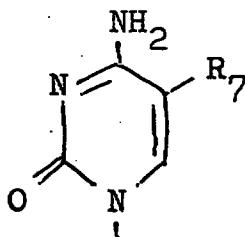


1.)



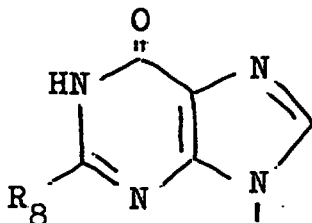
whereby R_6 can be hydrogen, an alkyl chain with 1 - 4 carbon atoms or halogen,

2.)



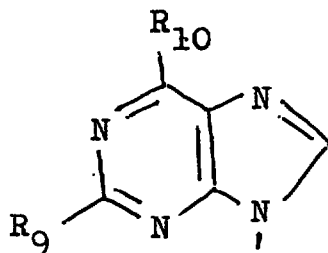
5 whereby R_7 can be hydrogen, an alkyl chain with 1 - 4 carbon atoms or halogen,

3.)



whereby R_8 can be hydrogen, an alkyl chain with 1 - 4 carbon atoms, halogen or a hydroxyl or an amino group,

10 4.)



whereby R_9 can be hydrogen or an amino group and R_{10} signifies hydrogen, halogen, C_1-C_6 -alkoxy, C_1-C_6 -alkylmercapto or an amino group which can be mono- or disubstituted by C_1-C_6 -alkyl, C_1-C_6 -alkoxy, hydroxy- C_2-C_6 -alkyl and/or C_3-C_6 -cycloalkyl, aryl, hetaryl, aralkyl or hetarylalkyl groups which can possibly also be substituted in the aryl or hetaryl radical by one or more hydroxyl, methoxy or alkyl groups or halogen, or allyl which can possibly be

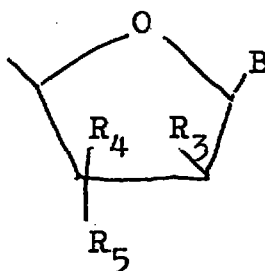


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substituted with mono- or dialkyl or alkoxy groups, their tautomers and their physiologically compatible salts of inorganic or organic acids and bases.

2. Compounds according to claim 1, wherein R_1 signifies C_{10} - C_{14} -alkyl.
3. Compounds according to claim 1 or 2, wherein R_2 signifies C_8 - C_{12} -alkyl.
4. Compounds according to one of claims 1 - 3, in which the group

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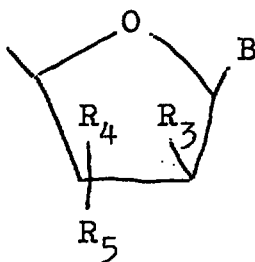


represents a radical selected from:

- 2',3'-didesoxy-3'-azidouridine
- 2',3'-didesoxyinosine
- 2',3'-didesoxyguanosine
- 15 -2',3'-didesoxyadenosine
- 3'-desoxythymidine
- 2',3'-didesoxy-2',3'-didehydro- N^6 -(o-methylbenzyl)-adenosine
- 2',3'-didesoxy-2',3'-didehydro- N^6 -(2-methylpropyl)-adenosine
- 20 -2',3'-didesoxy-3'-azidoguanosine
- 2',3'-didesoxy-3'-fluoro-5-chlorouridine
- 3'-desoxy-3'-fluorothymidine
- 2',3'-didesoxy-3'-fluoroadenosine
- 25 -2',3'-didesoxy-2',3'-didehydrocytidine
- 3'-desoxy-2',3'-didehydrothymidine
- 3'-desoxy-3'-azidothymidine
- 2',3'-didesoxy-3'-fluoro-2,6-diaminopurine riboside
5. Compounds according to claim 1, in which R_1
- 30 represents dodecyl, R_2 decyl and the group

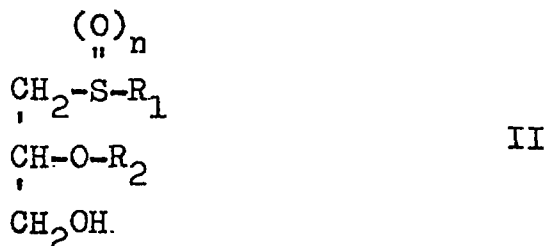


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a 2',3'-didesoxy-2',3'-didehydro-N⁶-(o-methylbenzyl)-adenosine, 3'-desoxy-3'-azidothymidine, 3'-desoxythymidine or 2',3'-didesoxyinosine radical.

- 5 6. Compounds of the formula I according to claim 1 selected from the group consisting of
(3'-desoxy-3'-azidothymidine)-5'-phosphoric acid (3-dodecylmercapto-2-decyloxy)-propyl ester
(3'-desoxy-3'-azidothymidine)-5'-phosphoric acid (3-
10 undecylmercapto-2-undecyloxy)-propyl ester
2',3'-didesoxy-2',3'-didehydro-N⁶-(o-methylbenzyl)-adenosine-5'-phosphoric acid (3-dodecylmercapto-2-decyloxy)-propyl ester
(3'-desoxythymidine)-5'-phosphoric acid (3-dodecyl-
15 mercapto-2-decyloxy)-propyl ester
(2',3'-didesoxyinosine)-5'-phosphoric acid (3-dodecylmercapto-2-decyloxy)-propyl ester
(3'-desoxy-2',3'-didehydrothymidine)-5'-phosphoric acid (3-dodecylmercapto-2-decyloxy)-propyl ester
20 (3'-desoxy-3'-fluorothymidine)-5'-phosphoric acid (3-dodecylmercapto-2-decyloxy)-propyl ester.
7. Process for the preparation of compounds of general formula I according to one of claims 1 - 6, characterised in that, in per se known manner, one
25 1. brings to reaction a compound of the general formula II

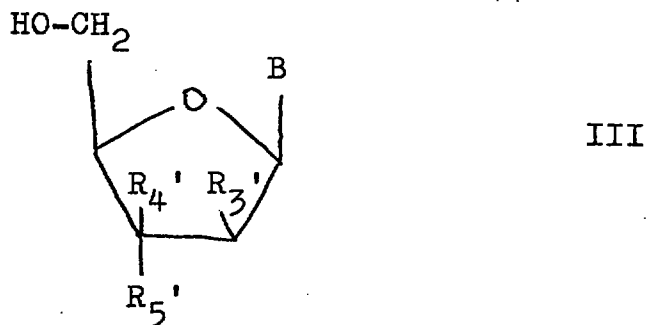


in which R₁, R₂ and n possess the given meanings,



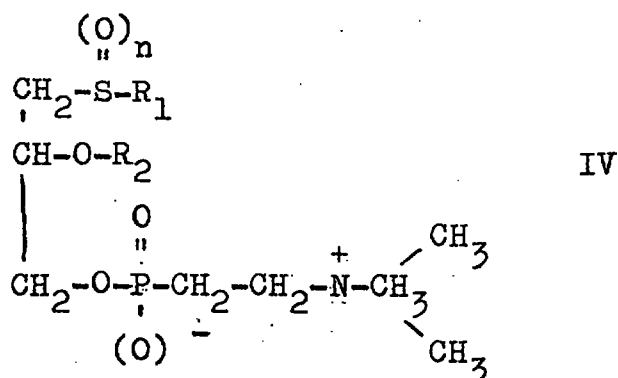
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with a compound of the general formula III,



in which R_3' represents hydrogen or a hydroxyl group protected by an oxygen protective group conventional to the expert and R_4' and R_5' are each hydrogen, halogen, an azido, a cyano group or one of the radicals R_4' and R_5' signifies a hydroxyl group protected by an oxygen protective group conventional to the expert or R_3' and R_4' represent a further bond and B possesses the given meanings, in the presence of phosphorus oxychloride and a phosphoric acid ester and of a tert. nitrogen base, e.g. pyridine or triethylamine, in an inert solvent, such as e.g. toluene, and, after hydrolysis has taken place, possibly splits off the oxygen protective groups according to processes conventional in nucleoside chemistry, or

2. brings to reaction a compound of the general formula IV



in which R_1 , R_2 and n possess the above-given meanings, with a compound of the general formula III, in which R_3' , R_4' , R_5' and B possess the given meanings, in the presence of phospholipase D in an inert solvent, such as e.g. chloroform, and in the



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- presence of a suitable buffer and, after the reaction has taken place, possibly splits off the oxygen protective group according to processes conventional in nucleoside chemistry; and
- 5 subsequently, if desired, converts the compounds obtained into physiologically compatible salts.
8. Medicaments containing at least one compound according to one of claims 1 - 6 and usual carrier and adjuvant materials.
- 10 9. Use of compounds according to one of claims 1 - 6 for the production of medicaments for the therapy of viral infections.
10. Use of compounds according to one of claims 1 - 6 for the production of medicaments for the
- 15 treatment of retroviral HIV infection.