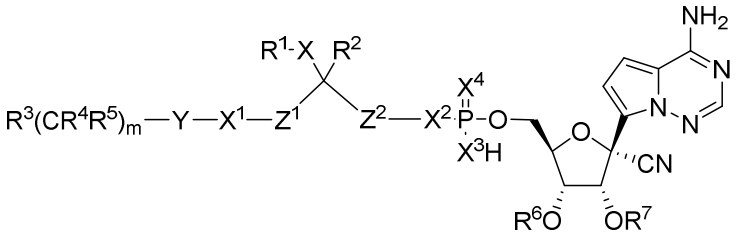
**CLAIMS**

1. A compound of Formula I:



Formula I

or a pharmaceutically acceptable salt thereof, wherein:

$Z^1$ is a bond, $-CH_2-$, $-CH_2-CH_2-$, $-CR^{ZA}R^{ZB}-$, or $-CR^{ZA}R^{ZB}-CR^{ZC}R^{ZD}-$;

$Z^2$ is a bond, $-CH_2-$, $-CH_2-CH_2-$, $-CR^{ZE}R^{ZF}-$, or $-CR^{ZE}R^{ZF}-CR^{ZG}R^{ZH}$;

$R^{ZA}$, $R^{ZC}$, $R^{ZD}$, $R^{ZE}$, $R^{ZG}$, and $R^{ZH}$ is each independently H, halo, $C_1$-$C_3$ alkyl, or $C_1$-$C_3$ haloalkyl;

$R^{ZB}$ and $R^{ZF}$ are each independently halo, $C_1$-$C_3$ alkyl, or $C_1$-$C_3$ haloalkyl;

X is a bond, -O-, $-(CR^{12A}R^{12B})_q-$, $-O(CR^{12A}R^{12B})_q-$, or $-OCR^{12A}R^{12B}-(CR^{13}=CR^{14})-$; wherein

each $R^{12A}$ is independently H, $C_1$-$C_6$ alkyl, or phenyl; or

$R^2$ and $R^{12A}$ are joined to form a four to six membered cycloalkyl or a four to six membered heterocyclyl having one, two or three heteroatoms selected from N, O, and S;

each $R^{12B}$ is independently H or $C_1$-$C_6$ alkyl; or

$R^{12A}$ and $R^{12B}$ on same carbon are joined together to form a $C_3$-$C_6$ cycloalkylene;

$R^{13}$ is H, $C_1$-$C_6$ alkyl, or phenyl;

$R^{14}$ is H, $C_1$-$C_6$ alkyl, or phenyl; and

each q is independently 1 or 2;

$X^1$ is a bond, $NR^X$, or $-CONR^X-$, or -S-;

$R^X$ is H, $C_1$-$C_3$ alkyl, $C_1$-$C_3$ haloalkyl, or $-C(O)R^{XA}$;

$R^{XA}$ is $C_1$-$C_3$ alkyl;

$X^2$ is -O- or -S-;

$X^3$ is -O- or -S-;

$X^4$ is O or S;

$R^1$ is $C_1$-$C_{20}$ alkyl, $C_3$-$C_{10}$ cycloalkyl, $C_6$-$C_{10}$ aryl, 4 to 6 membered heterocyclyl containing one, two or three heteroatoms selected from N, S and O, or 5-10 membered heteroaryl containing one, two or three heteroatoms selected from N, S, and O; wherein the $R^1$ group is optionally substituted with one, two, or three $R^{1A}$ groups;

wherein each $R^{1A}$ is independently a $C_1$-$C_3$ alkyl, phenyl, halo, $C_1$-$C_3$ alkoxy, cyano, $-SO_2R^{1B}$, $-COOR^{1B}$, or $C_1$-$C_3$haloalkyl; or two $R^{1A}$ on same or adjacent carbons are joined together to from a 3 to 6 membered cycloalkyl or 4 to 6 membered heterocyclyl ring containing one, two or three heteroatoms selected from N, S, and O;

$R^{1B}$ is H or $C_1$-$C_3$ alkyl;

$R^2$ is H or $C_1$-$C_3$ alkyl;

Y is a bond, phenylene, or $C_3$-$C_6$ cycloalkylene;

$R^3$ is H, $C_1$-$C_3$ alkyl, halo, $C_1$-$C_3$ haloalkyl, or $C_3$-$C_6$ cycloalkyl;

each $R^4$ is independently H, $C_1$-$C_3$ alkyl, halo, $C_1$-$C_3$ haloalkyl, or $C_3$-$C_6$ cycloalkyl;

or two $R^4$ groups on adjacent carbon atoms together with the carbons to which they are attached form a carbon carbon double bond;

each $R^5$ is independently H, $C_1$-$C_3$ alkyl, halo, $C_1$-$C_3$ haloalkyl, or $C_3$-$C_6$ cycloalkyl; or

$R^4$ and $R^5$ groups on adjacent carbon atoms together with the carbons to which they are attached form a carbon carbon triple bond;

$R^6$ is H or -C(O)$C_1$-$C_6$ alkyl;

$R^7$ is H or -C(O)$C_1$-$C_6$ alkyl; and

m is an integer from 7 to 21.

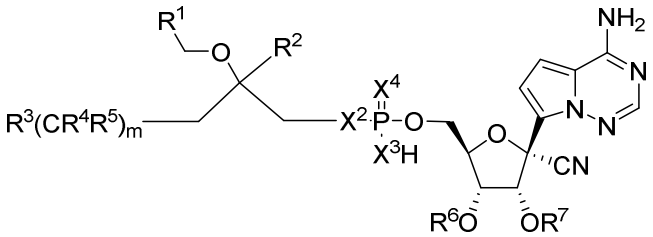
2. The compound according to claim 1, or a pharmaceutically acceptable salt thereof, wherein $Z^1$ is a bond, -$CH_2$-, -$CH_2$-$CH_2$-, or -$CH(CH_3)$-; and $Z^2$ is a bond, -$CH_2$-, -$CH_2$-$CH_2$-, or -$CH(CH_3)$-.

3. The compound according to claim 2, or a pharmaceutically acceptable salt thereof, wherein $Z^1$ is -$CH_2$- and $Z^2$ is -$CH_2$-.

4. The compound according to claim 2, or a pharmaceutically acceptable salt thereof, wherein $Z^1$ is a bond and $Z^2$ is -$CH_2$-.

5. The compound according to any one of claims 1-4, or a pharmaceutically acceptable salt thereof, wherein $X^1$ is a bond.

6. The compound according to any one of claims 1-5, or a pharmaceutically acceptable salt thereof, wherein the compound is of a Formula Ia:




7. The compound according to any one of claims 1-6, or a pharmaceutically acceptable salt thereof, wherein $X^2$ is O, $X^3$ is –O- and $X^4$ is O.

8. The compound according to any one of claims 1-7, or a pharmaceutically acceptable salt thereof, wherein $R^2$ is H.

9. The compound according to any one of claims 1-7, or a pharmaceutically acceptable salt thereof, wherein $R^2$ is $C_1$-$C_3$ alkyl, preferably methyl.

10. The compound according to any one of claims 1-9, or the pharmaceutically acceptable salt thereof, wherein $R^1$ is $C_6$-$C_{10}$ aryl optionally substituted with one, two, or three $R^{1A}$ groups.

11. The compound according to any one of claims 1-10, or the pharmaceutically acceptable salt thereof, wherein each $R^6$ and $R^7$ is H.

12. The compound according to any one of claims 1-11, or the pharmaceutically acceptable salt thereof, wherein

$R^3$ is H;

each $R^4$ is H;

each $R^5$ is H; and

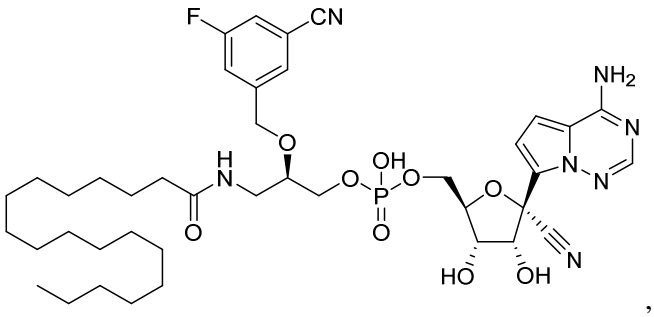
m is an integer from 14-20.

13. The compound according to any one of claims 1-12, or the pharmaceutically acceptable salt thereof, wherein m is 17, 18 or 19.

14. The compound according to any one of claims 1-13, or the pharmaceutically acceptable salt thereof, wherein each $R^{1A}$ is independently $C_1$-$C_3$ alkyl, cyano, halo, or $C_1$-$C_3$ alkoxy.

15. The compound according to claim 14, or the pharmaceutically acceptable salt thereof, wherein each $R^{1A}$ is independently halo or cyano, preferably fluoro, chloro, or cyano.

16. The compound according to claim 1, wherein the compound is selected from the group consisting of: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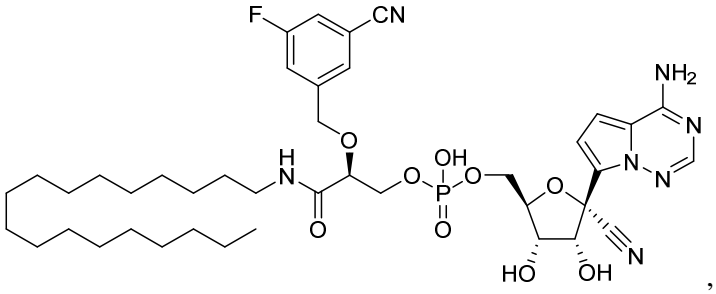
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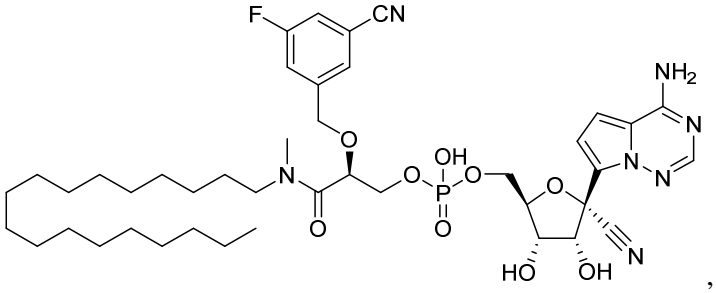
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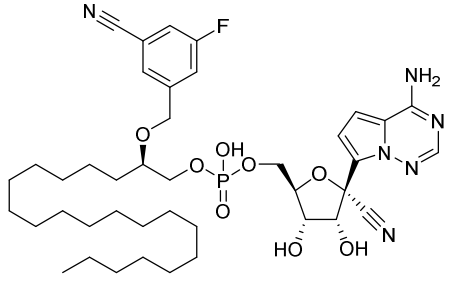
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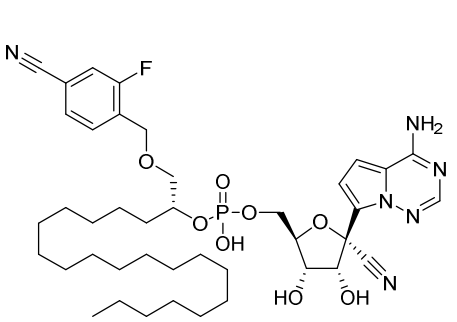
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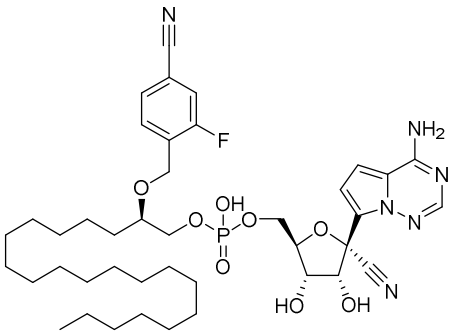
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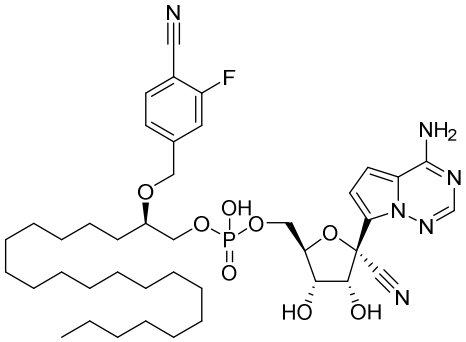
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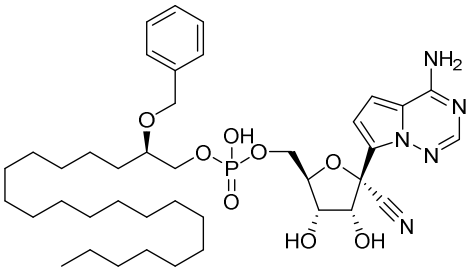
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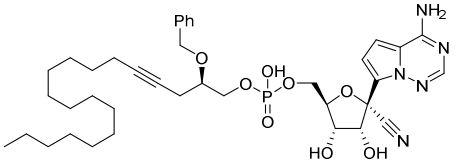
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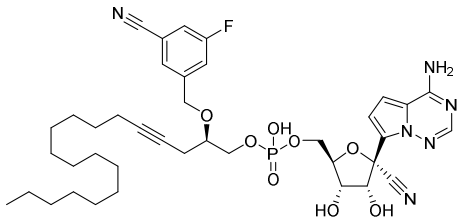
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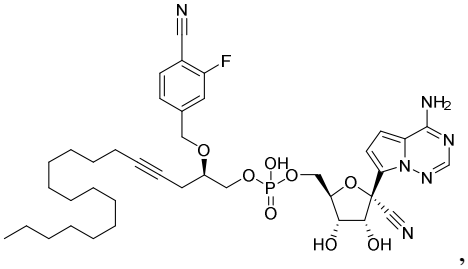
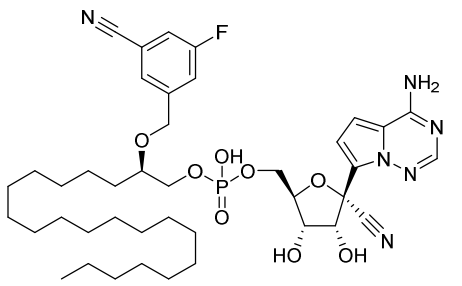

, or a pharmaceutically acceptable salt thereof.

17. The compound according to claim 1, wherein the compound is selected from the group consisting of: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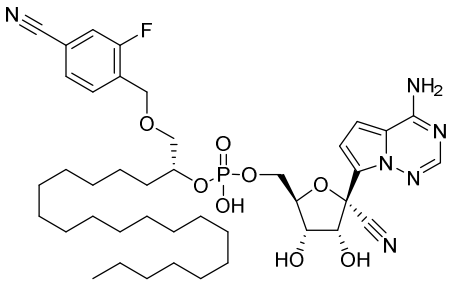
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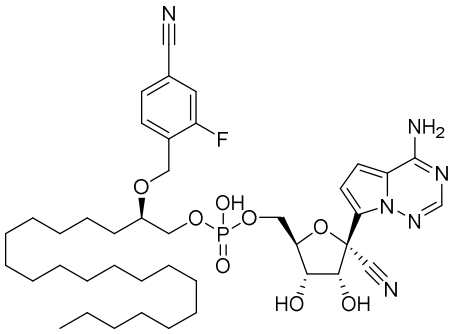
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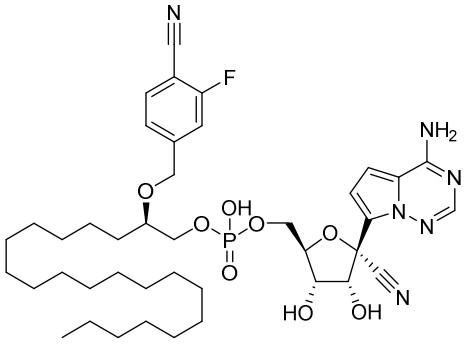
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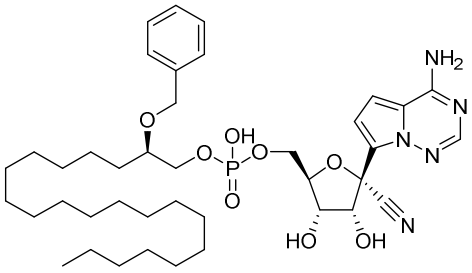
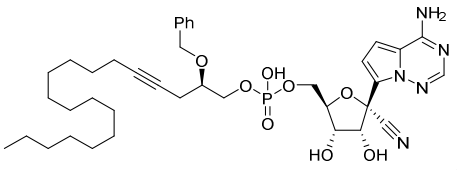
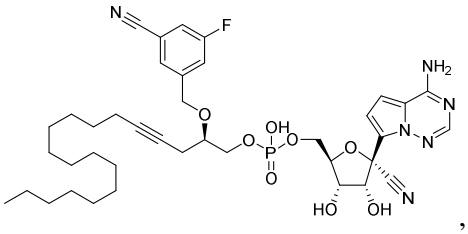

, or a pharmaceutically acceptable salt thereof.

18. The compound according to claim 1, wherein the compound is selected from the group consisting of: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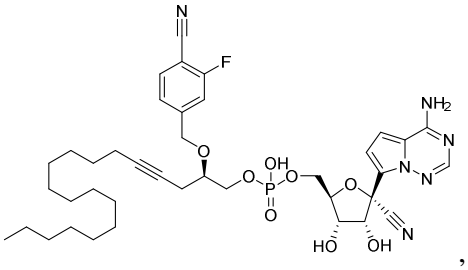
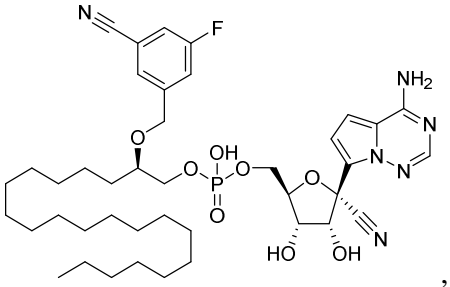
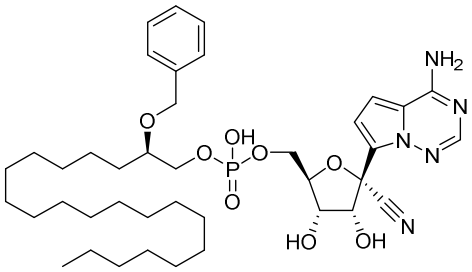

, or a pharmaceutically acceptable salt thereof.

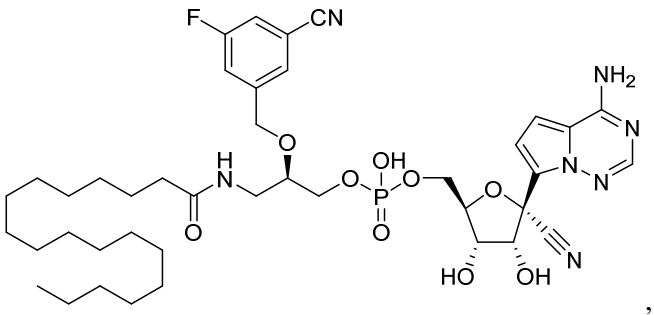
19. The compound according to claim 1, wherein the compound is of formula:


, or a pharmaceutically acceptable salt thereof.

20. The compound according to claim 1, wherein the compound is of formula:

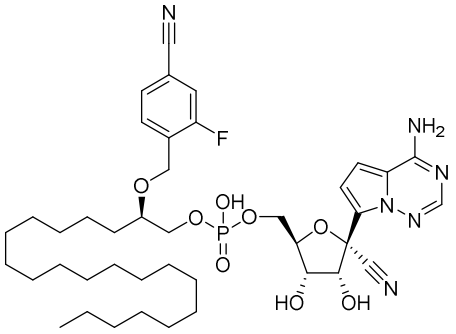

, or a pharmaceutically acceptable salt thereof.

21. The compound according to claim 1, wherein the compound is of formula:



, or a pharmaceutically acceptable salt thereof.

22. The compound according to claim 1, wherein the compound is of formula:



, or a pharmaceutically acceptable slat thereof.

23. A pharmaceutical formulation comprising a pharmaceutically effective amount of a compound according to any one of claims 1-22, or a pharmaceutically acceptable salt thereof, and a pharmaceutically acceptable carrier or excipient.

24. Use of a compound according to any one of claims 1-22, or a pharmaceutically acceptable salt thereof, in the manufacture of a medicament for the treatment or prevention of a viral infection in a human in need thereof.

25. The use according to claim 24, wherein the medicament is formulated for oral, intravenous, subcutaneous, or inhalation administration.

26. The use according to claim 24 or 25, wherein the medicament further comprises at least one additional therapeutic or prophylactic agent.

27. The use according to any one of claims 24-26, wherein the viral infection is a coronavirus infection, for example, a zoonotic coronavirus infection, a viral infection caused by a virus having at least 70% sequence homology to a viral polymerase selected from the group consisting of SARS polymerase, MERS polymerase and SARS-CoV-2 a viral infection caused by a virus having at least 80% sequence homology to a viral polymerase selected from the group consisting of SARS polymerase, MERS polymerase and SARS-CoV-2, a viral infection is caused by a virus having at least 90% sequence homology to a viral polymerase selected from the group consisting of SARS polymerase, MERS polymerase and SARS-CoV-2, a viral infection is caused by a virus having at least 95% sequence homology to a viral polymerase selected from the group consisting of SARS polymerase, MERS polymerase and SARS-CoV-2, or a viral infection is selected form the group consisting of 229E virus infection, NL63 virus infection, OC43 virus infection, and HKU1 virus infection.

28. The use according to claim 27, wherein the viral infection is SARS-CoV-2 infection.

29. The use according to claim 27, wherein the viral infection is a SARS virus infection or a MERS virus infection.

30. The use according to any one of claims 24-26, wherein the viral infection is a pneumoviridae virus infection, a flaviviridae virus infection, filoviridae virus infection, an orthomyxovirus infection or a paramyxoviridae virus infection.

31. The use according to claim 30, wherein the pneumoviridae virus infection is respiratory syncytial virus infection or a human metapneumovirus infection; the picornaviridae virus

infection is selected from the group consisting of an enterovirus infection, Coxsackie A virus infection, Coxsackie A virus infection, enterovirus D68 infection, enterovirus B69 infection, enterovirus D70 infection, enterovirus A71 infection, poliovirus infection and rhinovirus infection; the flaviviridae virus infection is selected from the group consisting of a dengue virus infection, yellow fever virus infection, West Nile virus infection, tick borne encephalitis, Kunjin Japanese encephalitis, St. Louis encephalitis, Murray valley encephalitis, Omsk hemorrhagic fever, bovine viral diarrhea, zika virus infection, and a HCV infection; the filoviridae virus infection is an ebola virus infection or a Marburg virus infection; the orthomyxovirus infection is selected from the group consisting of an influenza virus infection, an influenza A virus infection and an influenza B virus infection; and the paramyxoviridae virus infection is selected from the group consisting of a human parainfluenza virus, nipah virus, Hendra virus, measles, and a mumps infection.