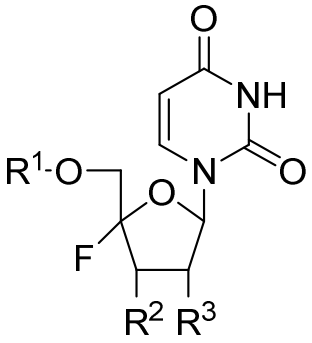
CLAIMS

What is claimed is:

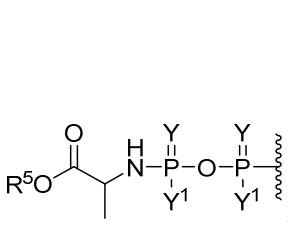
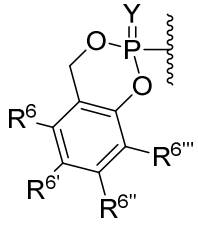
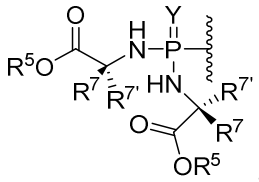
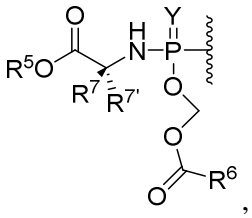
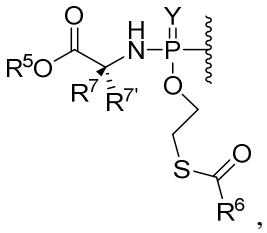
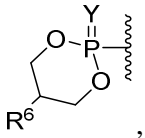
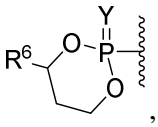
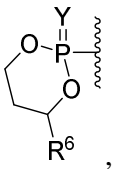
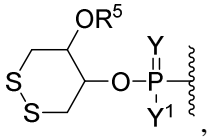
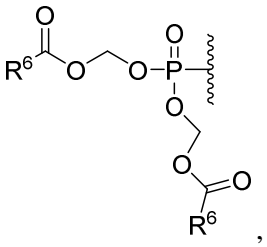
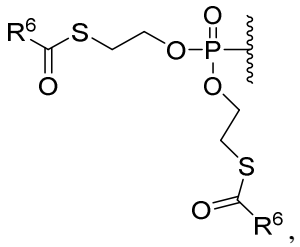
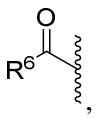
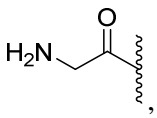
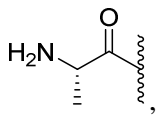
1. A compound of Formula XXVIII,

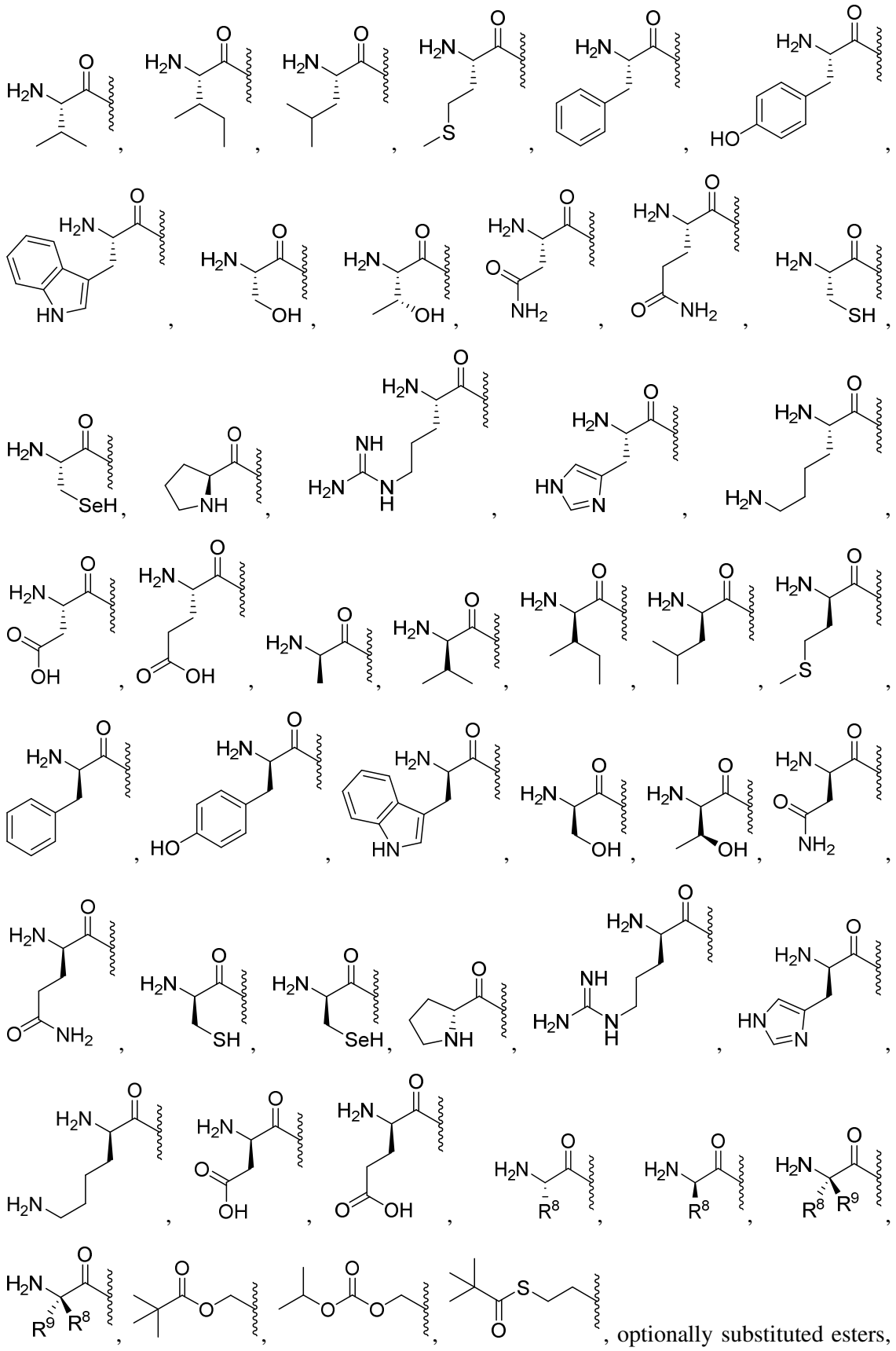


Formula XXVIII

or a pharmaceutical or physiological salt thereof, wherein

R^1 is selected from,

 ,
 ,
 ,
 ,
 ,
 ,
 ,
 ,
 ,
 ,
 ,
 ,
 ,
 ,


, optionally substituted esters,

optionally substituted branched esters, optionally substituted carbonates, optionally substituted carbamates, optionally substituted thioesters, optionally substituted branched thioesters, optionally substituted thiocarbonates, optionally substituted S-thiocarbonate, optionally substituted dithiocarbonates, optionally substituted thiocarbamates, optionally substituted oxymethoxycarbonyl, optionally substituted oxymethoxythiocarbonyl, optionally substituted oxymethylcarbonyl, optionally substituted oxymethylthiocarbonyl, L-amino acid esters, D-amino acid esters, N-substituted L-amino acid esters, N,N-disubstituted L-amino acid esters, N-substituted D-amino acid esters, N,N-disubstituted D-amino acid esters, optionally substituted sulfenyl, optionally substituted imidate, optionally substituted hydrazonate, optionally substituted oximyl, optionally substituted imidinyl, optionally substituted imidyl, optionally substituted aminal, optionally susbstituted hemiaminal, optionally substituted acetal, optionally susbstituted hemiacetal, optionally substituted carbonimidate, optionally substituted thiocarbonimidate, optionally substituted carbonimidyl, optionally substituted carbamimidate, optionally substituted carbamimidyl, optionally substituted thioacetal, optionally substituted S-acyl-2-thioethyl, optionally substituted bis-(acyloxybenzyl)esters, optionally substituted (acyloxybenzyl)esters, and BAB-esters, wherein R^1 is optionally substituted with one or more, the same or different, R^{10};

Y is O or S;

Y^1 is OH, OY^3, or $BH_3^-M^+$;

Y^3 is aryl, heteroaryl, or heterocyclyl, wherein Y^3 is optionally substituted with one or more, the same or different, R^{10};

R^2 is hydroxyl

R^3 is hydroxy;

R^5 is hydrogen, alkyl, alkenyl, alkynyl, carbocyclyl, heterocarbocyclyl, aryl, heteroaryl, heterocyclyl, cycloalkyl, cycloalkenyl, allenyl, or lipid, wherein R^5 is optionally substituted with one or more, the same or different, R^{10};

R^6, $R^{6'}$, $R^{6''}$, and $R^{6'''}$ are each independently selected from hydrogen, deuterium, hydroxyl, amino, azido, thiol, acyl, formyl, halogen, nitro, alkyl, alkenyl, alkynyl, carbocyclyl, heterocarbocyclyl, aryl, heteroaryl, heterocyclyl, cycloalkyl, cycloalkenyl, alkoxy, carbocycloxy, heterocarbocycloxy, aryloxy, heteroaryloxy, heterocycloxy, cycloalkoxy, cycloalkenoxy, alkylamino, $(alkyl)_2$amino, carbocyclamino, heterocarbocyclamino, arylamino, heteroarylamino, heterocyclamino, cycloalkamino, cycloalkenamino, alkylthio, carbocyclylthio, heterocarbocyclylthio, arylthio, heteroarylthio, heterocyclylthio, cycloalkylthio, cycloalkenylthio, sulfinyl, sulfamoyl, sulfonyl allenyl, cyano, or lipid, wherein R^6, $R^{6'}$, $R^{6''}$, and $R^{6'''}$ can each be optionally substituted with one or more, the same or different, R^{10};

R^7 and $R^{7'}$ are each independently selected from hydrogen, deuterium, hydroxy, azido, thiol, amino, cyano, halogen, alkyl, alkenyl, alkynyl, carbocyclyl, heterocarbocyclyl, aryl, heteroaryl, heterocyclyl, cycloalkyl, cycloalkenyl, alkoxy, carbocycloxy, heterocarbocycloxy, aryloxy, heteroaryloxy, heterocycloxy, cycloalkoxy, cycloalkenoxy, alkylamino, $(alkyl)_2$amino, carbocyclamino, heterocarbocyclamino, arylamino, heteroarylamino, heterocyclamino, cycloalkamino, cycloalkenamino, alkylthio, carbocyclylthio, heterocarbocyclylthio, arylthio, heteroarylthio, heterocyclylthio, cycloalkylthio, cycloalkenylthio, allenyl, sulfinyl, sulfamoyl, sulfonyl, lipid, nitro, or carbonyl, wherein R^7 is optionally substituted with one or more, the same or different, R^{10};

R^8 is deuterium, hydroxy, azido, thiol, amino, cyano, halogen, alkyl, alkenyl, alkynyl, carbocyclyl, heterocarbocyclyl, aryl, heteroaryl, heterocyclyl, cycloalkyl, cycloalkenyl, alkoxy, carbocycloxy, heterocarbocycloxy, aryloxy, heteroaryloxy, heterocycloxy, cycloalkoxy, cycloalkenoxy, alkylamino, $(alkyl)_2$amino, carbocyclamino, heterocarbocyclamino, arylamino, heteroarylamino, heterocyclamino, cycloalkamino, cycloalkenamino, alkylthio, carbocyclylthio, heterocarbocyclylthio, arylthio, heteroarylthio, heterocyclylthio, cycloalkylthio, cycloalkenylthio, allenyl, sulfinyl, sulfamoyl, sulfonyl, lipid, nitro, or carbonyl, wherein R^8 is optionally substituted with one or more, the same or different, R^{10};

R^9 is deuterium, hydroxy, azido, thiol, amino, cyano, halogen, alkyl, alkenyl, alkynyl, carbocyclyl, heterocarbocyclyl, aryl, heteroaryl, heterocyclyl, cycloalkyl, cycloalkenyl, alkoxy, carbocycloxy, heterocarbocycloxy, aryloxy, heteroaryloxy, heterocycloxy,

cycloalkoxy, cycloalkenoxy, alkylamino, $(alkyl)_2$amino, carbocyclamino, heterocarbocyclamino, arylamino, heteroarylamino, heterocyclamino, cycloalkamino, cycloalkenamino, alkylthio, carbocyclylthio, heterocarbocyclylthio, arylthio, heteroarylthio, heterocyclylthio, cycloalkylthio, cycloalkenylthio, allenyl, sulfinyl, sulfamoyl, sulfonyl, lipid, nitro, or carbonyl, wherein R^9 is optionally substituted with one or more, the same or different, R^{10};

R^7, $R^{7'}$, R^8, and R^9 can form a ring with the α-carbon they are attached to and the amino group attached to the α-carbon, wherein the ring is optionally substituted with one or more, the same or different, R^{10};

R^7 and $R^{7'}$ can form a ring with the α-carbon which they are attached, wherein the ring is optionally substituted with one or more, the same or different, R^{10};

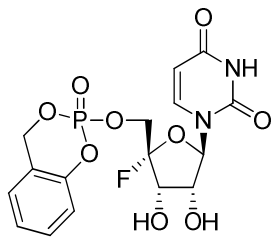
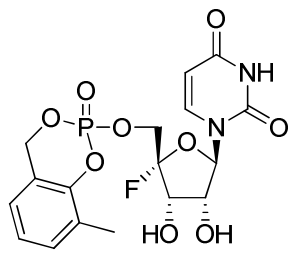
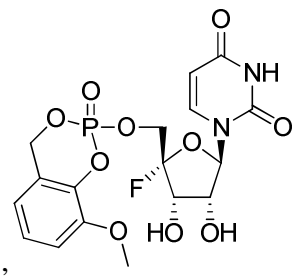
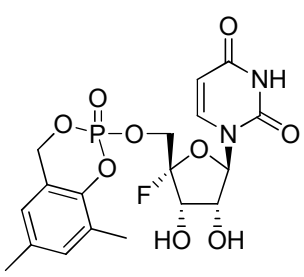
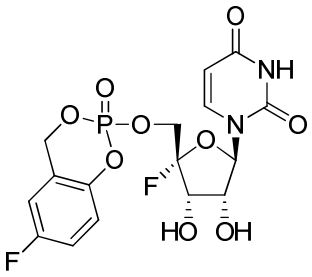
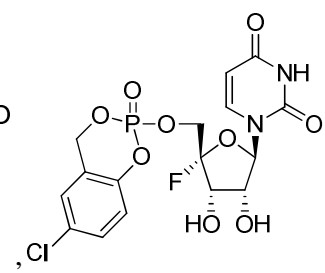
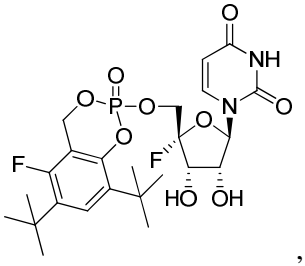
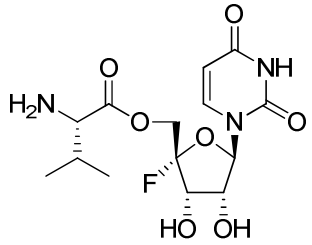
R^8 and R^9 can form a ring with the α-carbon which they are attached, wherein the ring is optionally substituted with one or more, the same or different, R^{10};

R^{10} is deuterium, hydroxy, azido, thiol, amino, cyano, halogen, alkyl, alkenyl, alkynyl, carbocyclyl, heterocarbocyclyl, aryl, heteroaryl, heterocyclyl, cycloalkyl, cycloalkenyl, alkoxy, carbocycloxy, heterocarbocycloxy, aryloxy, heteroaryloxy, heterocycloxy, cycloalkoxy, cycloalkenoxy, alkylamino, $(alkyl)_2$amino, carbocyclamino, heterocarbocyclamino, arylamino, heteroarylamino, heterocyclamino, cycloalkamino, cycloalkenamino, alkylthio, carbocyclylthio, heterocarbocyclylthio, arylthio, heteroarylthio, heterocyclylthio, cycloalkylthio, cycloalkenylthio, allenyl, sulfinyl, sulfamoyl, sulfonyl, lipid, nitro, or carbonyl, wherein R^{10} is optionally substituted with one or more, the same or different, R^{11};

R^{11} is deuterium, hydroxy, azido, thiol, amino, cyano, halogen, alkyl, alkenyl, alkynyl, carbocyclyl, heterocarbocyclyl, aryl, heteroaryl, heterocyclyl, cycloalkyl, cycloalkenyl, alkoxy, carbocycloxy, heterocarbocycloxy, aryloxy, heteroaryloxy, heterocycloxy, cycloalkoxy, cycloalkenoxy, alkylamino, $(alkyl)_2$amino, carbocyclamino, heterocarbocyclamino, arylamino, heteroarylamino, heterocyclamino, cycloalkamino, cycloalkenamino, alkylthio, carbocyclylthio, heterocarbocyclylthio, arylthio, heteroarylthio, heterocyclylthio, cycloalkylthio, cycloalkenylthio, allenyl, sulfinyl, sulfamoyl, sulfonyl, lipid, nitro, or carbonyl; and

Lipid is a C_{11}-C_{22} higher alkyl, C_{11}-C_{22} higher alkoxy, polyethylene glycol, or aryl substituted with an alkyl group.

2. The compound according to claim 1, selected from the following:

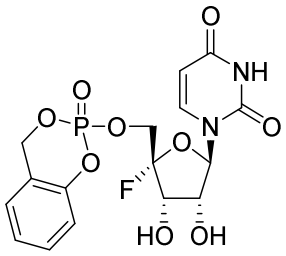
3. Use of an effective amount of a compound of claim 1 in the manufacture of a medicament for treating or preventing a viral infection in a subject.

4. The use of claim 3, wherein the viral infection is caused by a Togaviridae, Coronaviridae, Orthomyxoviridae, Pneumoviridae, Arenaviridae, Bunyaviridae, Flaviviridae, or Picornaviridae family virus.

5. The use of claim 3, wherein the virus is selected from Eastern equine encephalitis virus, Western equine encephalitis virus, Venezuelan equine encephalitis virus, Chikungunya virus, Ross River virus, human coronavirus, SARS coronavirus, MERS coronavirus, influenza A,

influenza B, RSV, Tacaribe virus, Pichinde virus, Junin virus, Lassa fever virus, Lymphocytic Choriomeningitis virus, Rift Valley fever virus, Punta Toro virus, LaCrosse virus, Maporal virus, Heartland virus, Severe Fever Thrombocytopenia Syndrome virus, Zika virus, Dengue virus 1, Dengue virus 2, Dengue virus 3, Dengue virus 4, West Nile virus, Yellow fever virus, Japanese encephalitis virus, Powassen virus, Usutu virus, tick-borne encephalitis virus, poliovirus, Coxsackie virus, and enterovirus.

6. The use of claim 3, wherein the compound is chosen from: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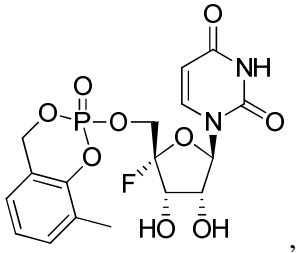
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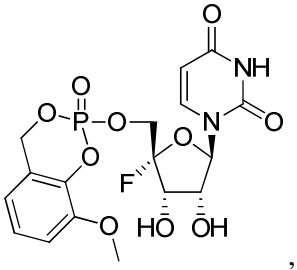
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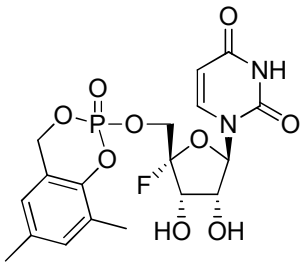
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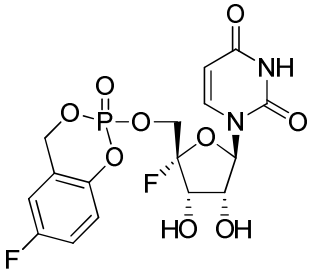
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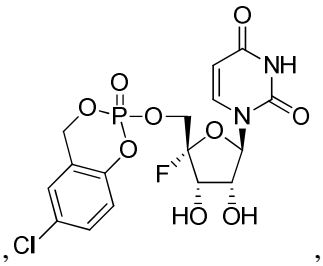
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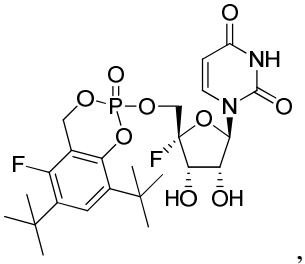
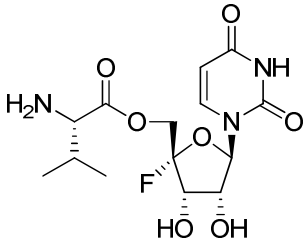
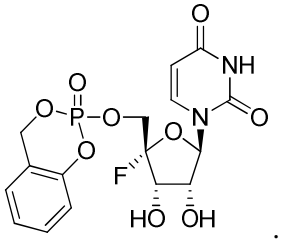


, and

or pharmaceutically acceptable or physiological salts thereof.

7. The compound of claim 1, having the formula: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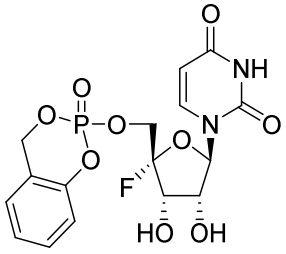
8. The use of claim 3, wherein the compound is:



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