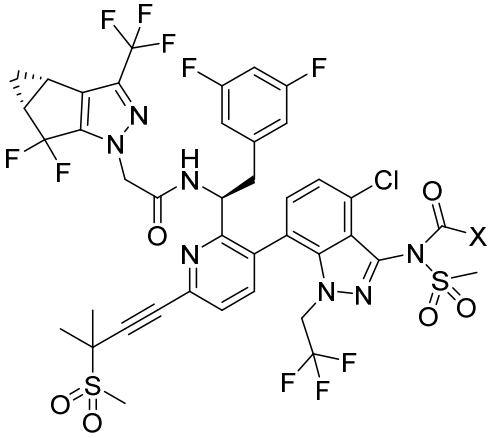
WHAT IS CLAIMED IS:

1. A compound of Formula I,



Formula I

or a pharmaceutically acceptable salt thereof,

wherein

X is $-NR^1R^2$, C_{1-10} alkyl, or C_{2-6} alkenyl,

wherein the C_{1-10} alkyl and C_{2-6} alkenyl are each independently substituted with 1-3 Y groups;

each Y independently is $-B(OH)_2$, -CN, halogen, R^a, R^b, R^c, phenyl, naphthalenyl, 5-6 membered monocyclic heteroaryl, or 8-10 membered fused bicyclic heteroaryl,

wherein the phenyl, naphthalenyl, 5-6 membered monocyclic heteroaryl, and 8-10 membered fused bicyclic heteroaryl are each independently substituted with 1-5 R^3 groups, or

two Y groups on the same carbon, together with the carbon to which they are attached, form a C_{3-5} monocyclic cycloalkyl;

R^1 is H or C_{1-6} alkyl, wherein the C_{1-6} alkyl is optionally substituted with 1-3 groups independently selected from -CN, halogen, R^a, R^b, and R^c;

R^2 is phenyl or 5-6 membered monocyclic heteroaryl, wherein the phenyl and 5-6 membered monocyclic heteroaryl are each independently optionally substituted with 1-3 groups independently selected from -CN, halogen, R^a, R^b, R^c, and C_{1-6} alkyl,

wherein the C_{1-6} alkyl is optionally substituted with 1-3 groups

independently selected from -CN, halogen, R^a, R^b, and R^c;

each R^3 independently is R^a, R^b, R^c, C_{1-6} alkyl, or 5-6 membered monocyclic heteroaryl, wherein the C_{1-6} alkyl and 5-6 membered monocyclic heteroaryl are each independently optionally substituted with 1-3 groups independently selected from -CN, halogen, R^a, R^b, and R^c;

each R^a independently is $-P(O)(OH)_2$ or $-OP(O)(OH)_2$;

each R^b independently is $-C(O)R^4$, $-C(O)OR^4$, $-C(O)NR^5R^5$, $-C(O)C(O)OR^4$, $-S(O)_2R^4$, $-S(O)_2NR^5R^5$, or $-S(O)_2OR^4$;

each R^c independently is $-OR^4$, $-OC(O)R^4$, $-OC(O)C(O)OR^4$, $-(O(C_{1-4}\text{ alkyl}))_nOR^4$, $-NR^5R^5$, $-N^+R^5R^5R^{5a}$, $-NR^5C(O)R^4$, $-NR^5C(O)NR^5R^5$, $-NR^5C(O)OR^4$, $-NR^5C(O)C(O)OR^4$, or $-NR^5S(O)_2R^4$;

each R^4 independently is H or C_{1-6} alkyl, wherein the C_{1-6} alkyl is optionally substituted with 1-3 groups independently selected from -CN, halogen, R^a, R^d, and R^e;

each R^5 independently is H, R^d, C_{1-6} alkyl, or 5-6 membered monocyclic heteroaryl,

wherein the C_{1-6} alkyl is optionally substituted with 1-3 groups independently selected from -CN, halogen, $=NR^{5a}$, R^a, R^d, R^e, phenyl, naphthalenyl, and 8-10 membered fused bicyclic heteroaryl,

wherein the 5-6 membered monocyclic heteroaryl is optionally substituted with 1-3 groups independently selected from -CN, halogen, R^a, R^d, and R^e;

each R^{5a} independently is H or C_{1-3} alkyl;

each R^d independently is $-C(O)R^6$, $-C(O)OR^6$, $-C(O)NR^7R^7$, $-C(O)C(O)OR^6$, $-S(O)_2R^6$, $-S(O)_2NR^7R^7$, or $-S(O)_2OR^6$;

each R^e independently is $-OR^6$, $-OC(O)R^6$, $-OC(O)C(O)OR^6$, $-NR^7R^7$, $-NR^7C(O)R^7$, $-NR^7C(O)NR^7R^7$, $-NR^7C(O)OR^6$, $-NR^7C(O)C(O)OR^6$, or $-NR^7S(O)_2R^6$;

each R^6 independently is H or C_{1-6} alkyl, wherein the C_{1-6} alkyl is optionally substituted with 1-3 groups independently selected from CN, halogen, R^a, R^f, and R^g;

each R^7 independently is H, R^f, or C_{1-6} alkyl, wherein the C_{1-6} alkyl is optionally substituted with 1-3 groups independently selected from -CN, halogen, R^a, R^f, and R^g;

each R^f independently is $-C(O)R^8$, $-C(O)OR^8$, $-C(O)NR^8R^8$, $-C(O)C(O)OR^8$, $-S(O)_2R^8$,

$-S(O)_2NR^8R^8$, or $-S(O)_2OR^8$;

each R^g independently is $-OR^8$, $-OC(O)R^8$, $-OC(O)C(O)OR^8$, $-NR^8R^8$, $-NR^8C(O)R^8$, $-NR^8C(O)NR^8R^8$, $-NR^8C(O)OR^8$, $-NR^8C(O)C(O)OR^8$, or $-NR^8S(O)_2R^8$;

each R^8 independently is H or C_{1-6} alkyl, wherein the C_{1-6} alkyl is optionally substituted with 1-3 groups independently selected from -OH, CN, halogen, -C(O)OH, and R^a;

n is 1, 2, 3, 4, or 5; and

wherein each 5-6 membered monocyclic heteroaryl and 8-10 membered fused bicyclic heteroaryl independently have 1-4 ring heteroatoms independently selected from N, O, and S.

2. The compound of claim 1, or a pharmaceutically acceptable salt thereof, wherein

X is $-NR^1R^2$, C_{1-10} alkyl, or C_{2-6} alkenyl,

wherein the C_{1-10} alkyl and C_{2-6} alkenyl are each independently substituted with 1-3 Y groups;

each Y independently is -CN, halogen, R^a, R^b, R^c, phenyl, or naphthalenyl,

wherein the phenyl and naphthalenyl are each independently substituted with 1-5 R^3 groups, or

two Y groups on the same carbon, together with the carbon to which they are attached, form a C_{3-5} monocyclic cycloalkyl;

R^1 is H or C_{1-6} alkyl, wherein the C_{1-6} alkyl is optionally substituted with 1-3 groups independently selected from -OH, -CN, halogen, -C(O)OH, and R^a;

R^2 is phenyl or 5-6 membered monocyclic heteroaryl, wherein the phenyl and 5-6 membered monocyclic heteroaryl are each independently optionally substituted with 1-3 groups independently selected from -CN, halogen, R^a, R^b, R^c, and C_{1-6} alkyl,

wherein the C_{1-6} alkyl is optionally substituted with 1-3 groups independently selected from -CN, halogen, R^a, R^b, and R^c;

each R^3 independently is R^a, R^b, R^c, or C_{1-6} alkyl, wherein the C_{1-6} alkyl is optionally substituted with 1-3 groups independently selected from -CN, halogen, R^a, R^b, and R^c;

each R^a independently is $-P(O)(OH)_2$ or $-OP(O)(OH)_2$;

each R^b independently is $-C(O)R^4$, $-C(O)OR^4$, $-C(O)NR^5R^5$, $-C(O)C(O)OR^4$, $-S(O)_2R^4$, $-S(O)_2NR^5R^5$, or $-S(O)_2OR^4$;

each R^c independently is $-OR^4$, $-OC(O)R^4$, $-OC(O)C(O)OR^4$, $-(O(C_{1-4}\text{ alkyl}))_nOR^4$, $-NR^5R^5$, $-N^+R^5R^5R^{5a}$, $-NR^5C(O)R^4$, $-NR^5C(O)NR^5R^5$, $-NR^5C(O)OR^4$, $-NR^5C(O)C(O)OR^4$, or $-NR^5S(O)_2R^4$;

each R^4 independently is H or C_{1-6} alkyl, wherein the C_{1-6} alkyl is optionally substituted with 1-3 groups independently selected from -CN, halogen, R^a, R^d, and R^e;

each R^5 independently is H, R^d, or C_{1-6} alkyl, wherein the C_{1-6} alkyl is optionally substituted with 1-3 groups independently selected from -CN, halogen, $=NR^{5a}$, R^a, R^d, R^e, phenyl, and naphthalenyl;

each R^{5a} independently is H or C_{1-3} alkyl;

each R^d independently is $-C(O)R^6$, $-C(O)OR^6$, $-C(O)NR^7R^7$, $-C(O)C(O)OR^6$, $-S(O)_2R^6$, $-S(O)_2NR^7R^7$, or $-S(O)_2OR^6$;

each R^e independently is $-OR^6$, $-OC(O)R^6$, $-OC(O)C(O)OR^6$, $-NR^7R^7$, $-NR^7C(O)R^7$, $-NR^7C(O)NR^7R^7$, $-NR^7C(O)OR^6$, $-NR^7C(O)C(O)OR^6$, or $-NR^7S(O)_2R^6$;

each R^6 independently is H or C_{1-6} alkyl, wherein the C_{1-6} alkyl is optionally substituted with 1-3 groups independently selected from -OH, CN, halogen, -C(O)OH, and R^a;

each R^7 independently is H or C_{1-6} alkyl, wherein the C_{1-6} alkyl is optionally substituted with 1-3 groups independently selected from -OH, -CN, halogen, -C(O)OH, and R^a;

n is 1, 2, 3, 4, or 5; and

wherein each 5-6 membered monocyclic heteroaryl and 8-10 membered fused bicyclic heteroaryl independently have 1-4 ring heteroatoms independently selected from N, O, and S.

3. The compound of claim 1 or claim 2, or a pharmaceutically acceptable salt thereof, wherein

X is $-NR^1R^2$, C_{1-10} alkyl, or C_{2-4} alkenyl,

wherein the C_{1-10} alkyl and C_{2-4} alkenyl are each independently substituted with 1-

3 Y groups;

each Y independently is -OH, -CN, halogen, R^a, $-NR^5R^5$, $-N^+R^5R^5R^{5a}$, $-C(O)NR^5R^5$, $-C(O)OR^4$, $-OC(O)R^4$, $-(O(C_{1-4}\text{ alkyl}))_nOR^4$, or phenyl,

wherein the phenyl is substituted with 1-5 R^3 groups, or

two Y groups on the same carbon, together with the carbon to which they are attached, form a C_{3-5} monocyclic cycloalkyl;

R^1 is H or C_{1-4} alkyl, wherein the C_{1-4} alkyl is optionally substituted with 1-3 groups independently selected from -OH, -CN, halogen, -C(O)OH, and R^a;

R^2 is phenyl or 5-6 membered monocyclic heteroaryl, wherein the phenyl and 5-6 membered monocyclic heteroaryl are each independently optionally substituted with 1-3 groups independently selected from -OH, -CN, halogen, -C(O)OH, R^a, and C_{1-6} alkyl,

wherein the C_{1-6} alkyl is optionally substituted with 1-3 groups independently selected from -OH, -CN, halogen, -C(O)OH, $-NR^5R^5$, and R^a;

each R^3 independently is -OH, R^a, R^b, or C_{1-6} alkyl, wherein the C_{1-6} alkyl is optionally substituted with 1-3 groups independently selected from -OH, -CN, halogen, -C(O)OH, R^a, and R^b;

each R^a independently is $-P(O)(OH)_2$ or $-OP(O)(OH)_2$;

each R^b independently is $-C(O)OR^4$ or $-C(O)NR^5R^5$;

each R^4 independently is H or C_{1-6} alkyl, wherein the C_{1-6} alkyl is optionally substituted with 1-3 groups independently selected from -OH, -CN, halogen, -C(O)OH, $-NR^7R^7$, and R^a;

each R^5 independently is H, $-C(O)OR^6$, $-C(O)C(O)OR^6$, or C_{1-6} alkyl, wherein the C_{1-6} alkyl is optionally substituted with 1-3 groups independently selected from -OH, -CN, halogen, $-C(O)OR^6$, $=NR^{5a}$, $-NR^7R^7$, R^a, R^b, and phenyl;

each R^{5a} independently is H or C_{1-3} alkyl;

each R^6 independently is H or C_{1-6} alkyl, wherein the C_{1-6} alkyl is optionally substituted with 1-3 groups independently selected from -OH, CN, halogen, -C(O)OH, and R^a;

each R^7 independently is H or C_{1-3} alkyl, wherein the C_{1-3} alkyl is optionally substituted

with 1-3 groups independently selected from -OH, -CN, halogen, -C(O)OH, and R^a;

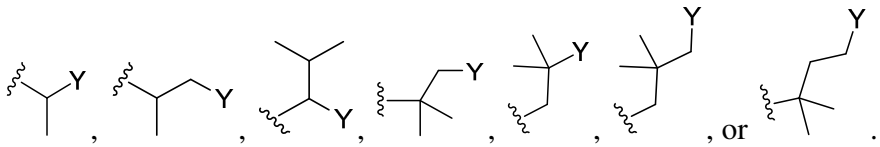
n is 1, 2, 3, 4, or 5; and

wherein each 5-6 membered monocyclic heteroaryl and 8-10 membered fused bicyclic heteroaryl independently have 1-4 ring heteroatoms independently selected from N, O, and S.

4. The compound of any one of claims 1-3, or a pharmaceutically acceptable salt thereof, wherein X is C_{1-10} alkyl, wherein the C_{1-10} alkyl is substituted with 1-3 Y groups.

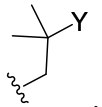
5. The compound of any one of claims 1-4, or a pharmaceutically acceptable salt thereof, wherein X is C_{1-6} alkyl, wherein the C_{1-6} alkyl is substituted with one Y group.

6. The compound of any one of claims 1-5, or a pharmaceutically acceptable salt thereof, wherein X substituted with Y is $-CH_2Y$, $-CH_2CH_2Y$, $-CH_2CH_2CH_2Y$, $-CH_2CH_2CH_2CH_2Y$,



, , , , , , or .

7. The compound of any one of claims 1-6, or a pharmaceutically acceptable salt thereof, wherein X substituted with Y is



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8. The compound of any one of claims 1-7, or a pharmaceutically acceptable salt thereof, wherein one Y is phenyl, wherein the phenyl is substituted with 1-5 R^3 groups.

9. The compound of any one of claims 1-8, or a pharmaceutically acceptable salt thereof, wherein one Y is phenyl, wherein the phenyl is substituted with 3 R^3 groups.

10. The compound of any one of claims 1-2 and 4-9, or a pharmaceutically acceptable salt thereof, wherein each R^3 independently is -C(O)OR^4, -C(O)NR^{5}R^5, -S(O)$_2$R^4, -S(O)$_2$NR^{5}R^5, -S(O)$_2$OR^4, -NR^{5}C(O)R^4, -NR^{5}C(O)NR^{5}R^5, -NR^{5}S(O)$_2$R^4, R^a, or C_{1-6} alkyl,

wherein the C_{1-6} alkyl is optionally substituted with 1-3 groups independently selected from -OH, -CN, halogen, -C(O)OR^4, -C(O)NR^{5}R^5, and R^a.

11. The compound of any one of claims 1-10, or a pharmaceutically acceptable salt thereof, wherein each R^3 independently is -OH, -C(O)OH, -C(O)NR^{5}R^5, R^a, or C_{1-3} alkyl, wherein the C_{1-3} alkyl is optionally substituted with 1-3 groups independently selected from -OH, -CN, halogen, -C(O)OH, -C(O)NR^{5}R^5, and R^a.

12. The compound of any one of claims 1-11, or a pharmaceutically acceptable salt thereof, wherein each R^3 independently is -OH, -C(O)OH, -C(O)NR^{5}R^5, R^a, methyl, -CH$_2$P(O)(OH)$_2$, -CH$_2$C(O)OH, or -CH$_2$C(O)NR^{5}R^5.

13. The compound of any one of claims 1-12, or a pharmaceutically acceptable salt thereof, wherein one R^3 is -OP(O)(OH)$_2$ and 1-2 R^3 is C_{1-3} alkyl, wherein the C_{1-3} alkyl is optionally substituted with 1-3 groups independently selected from -C(O)OH, -C(O)NR^{5}R^5, and R^a.

14. The compound of any one of claims 1-13, or a pharmaceutically acceptable salt thereof, wherein one Y is phenyl, wherein the phenyl is substituted with methyl, -OP(O)(OH)$_2$, and -CH$_2$C(O)OH.

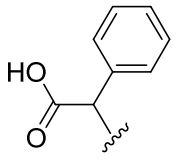
15. The compound of any one of claims 1-14, or a pharmaceutically acceptable salt thereof, wherein each R^4 independently is H or C_{1-6} alkyl, wherein the C_{1-6} alkyl is optionally substituted with 1-2 groups independently selected from -C(O)OH, -NR^{7}R^7, and R^a.

16. The compound of any one of claims 1-10 and 15, or a pharmaceutically acceptable salt

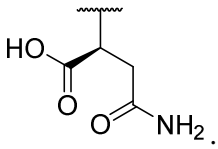
thereof, wherein each R^5 independently is H, -C(O)OR^6, -C(O)C(O)OR^6, or C_{1-4} alkyl,

wherein the C_{1-4} alkyl is optionally substituted with 1-2 groups independently selected from -C(O)OH, -C(O)NH_2, =NR^{5a}, -NR^7R^7, R^a, and phenyl.

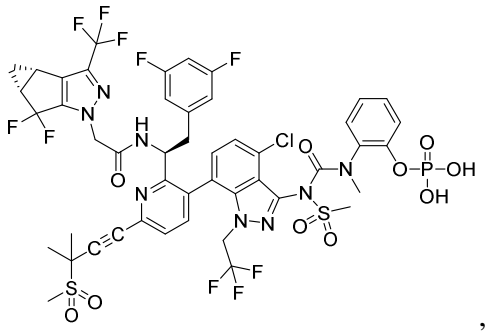
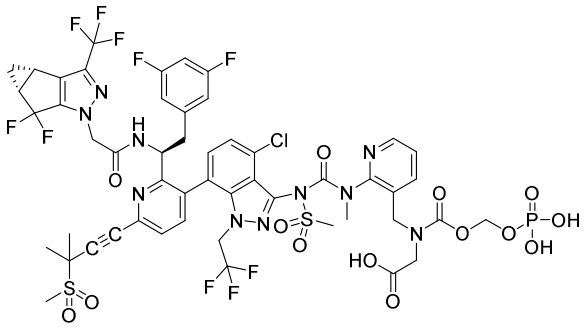
17. The compound of any one of claims 1-10 and 15-16, or a pharmaceutically acceptable salt thereof, wherein each R^5 independently is H, methyl, -CH_2CO_2H, -$CH_2P(O)(OH)_2$, -$CH_2CH_2CO_2H$, -C(O)OCH_3, -C(=NH)NH_2, -C(O)C(O)OH,

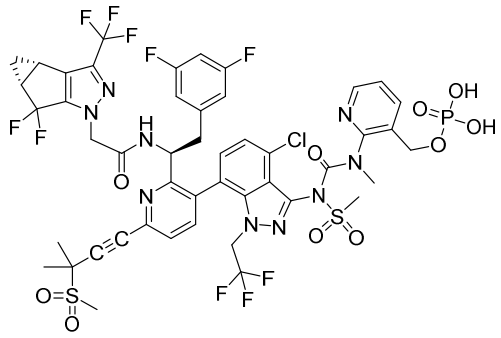
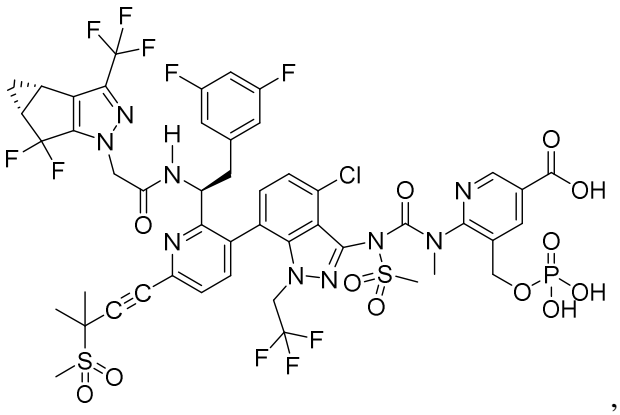
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18. The compound of any one of claims 1-10 and 15-17, or a pharmaceutically acceptable salt thereof, wherein one R^5 is


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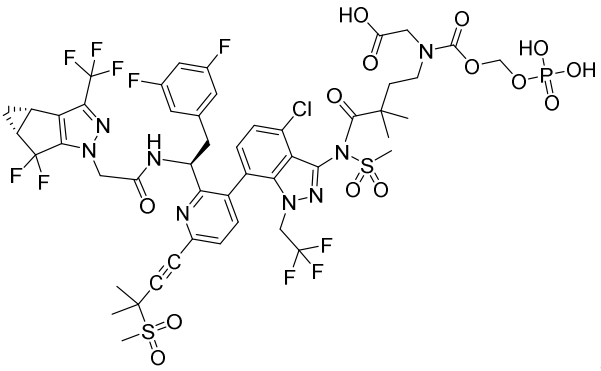
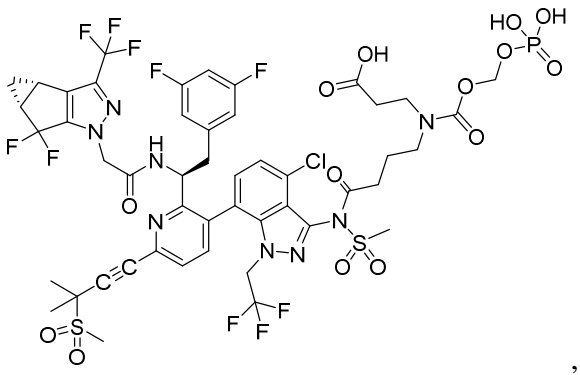
19. A compound selected from the group consisting of:

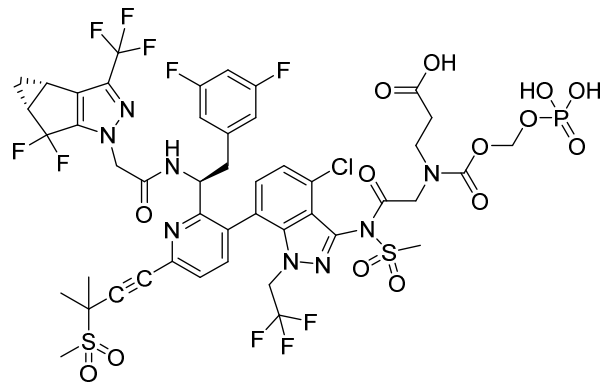
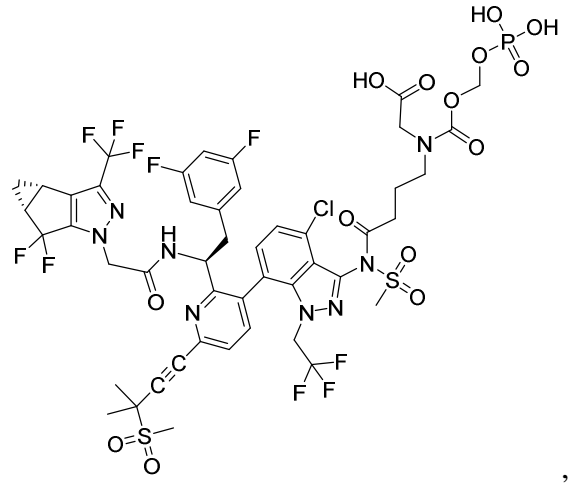

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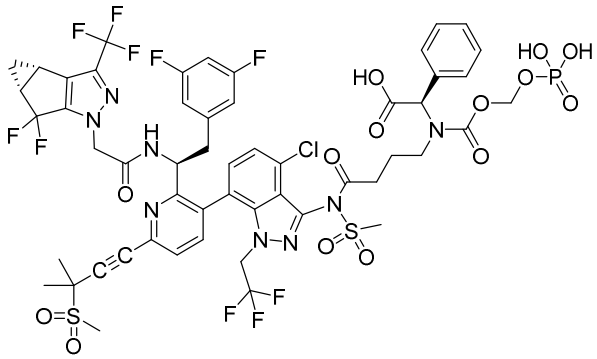
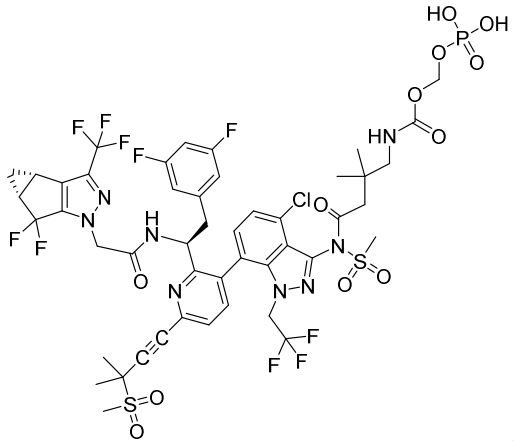
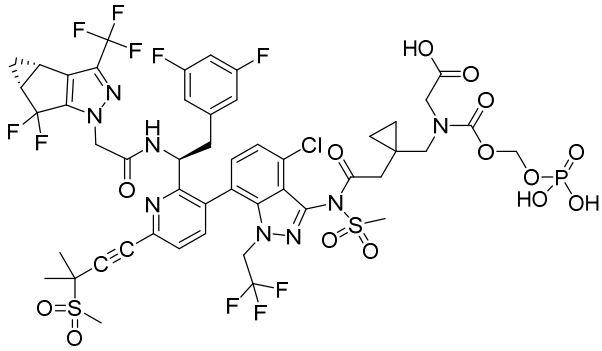
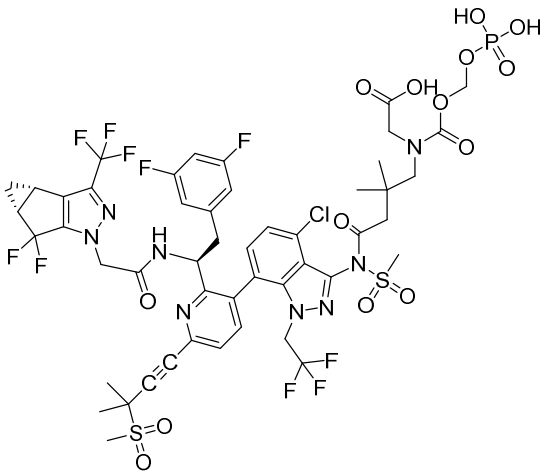
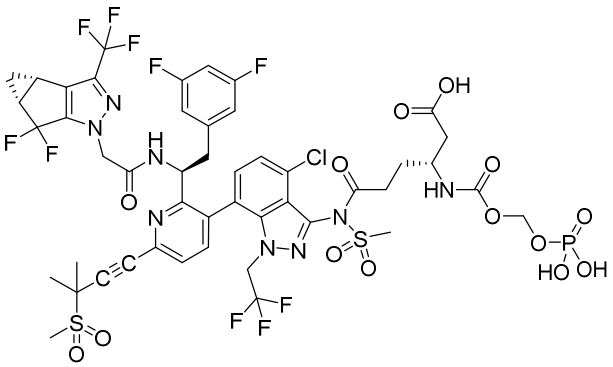
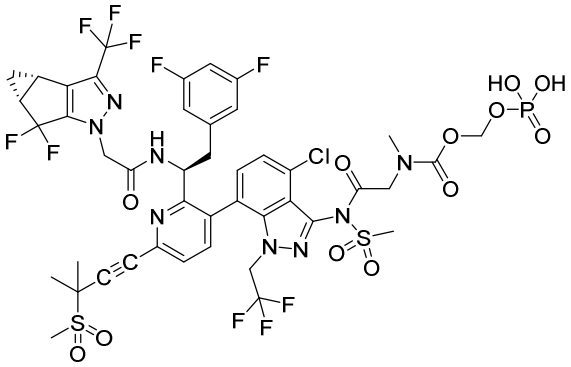

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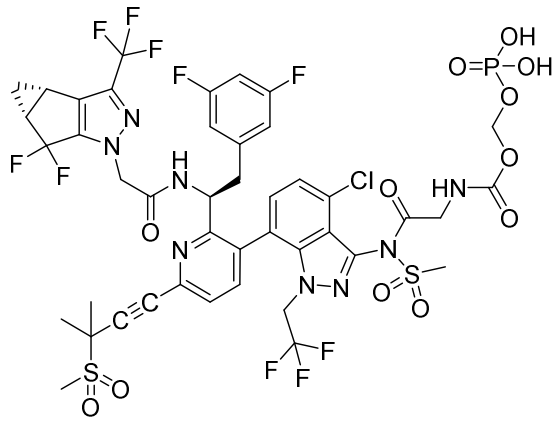
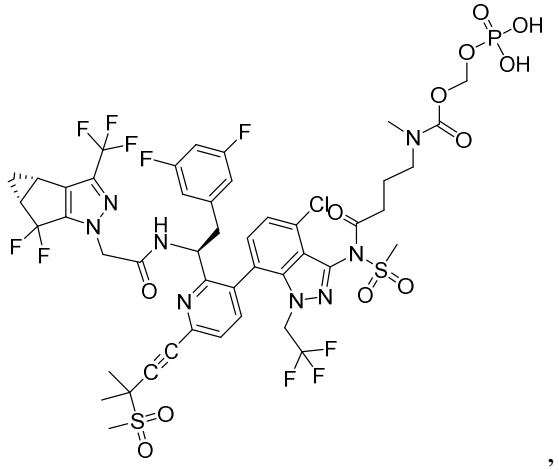
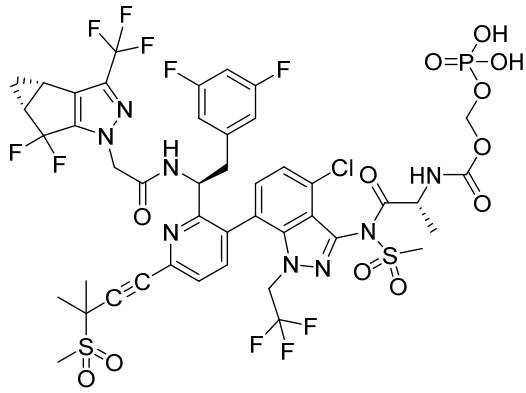
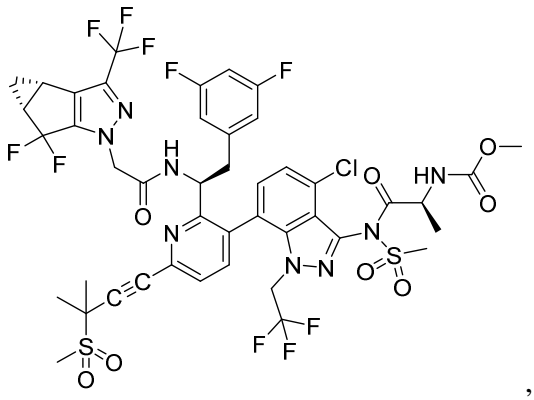
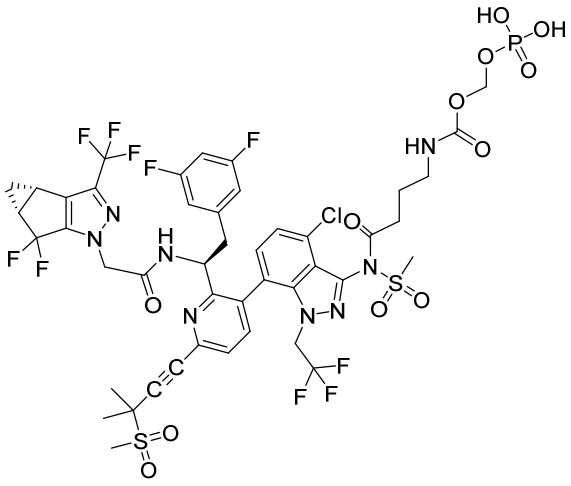
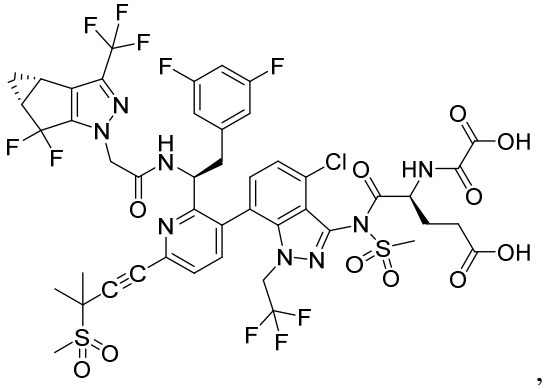
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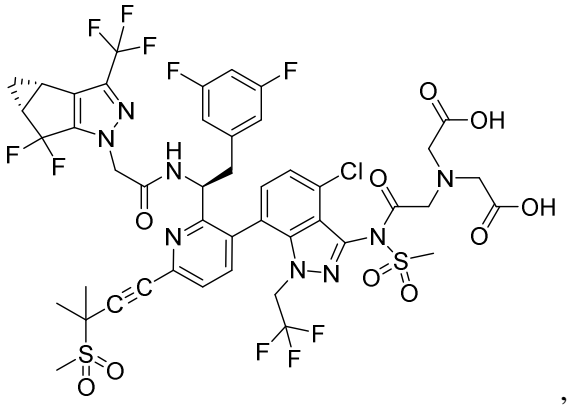
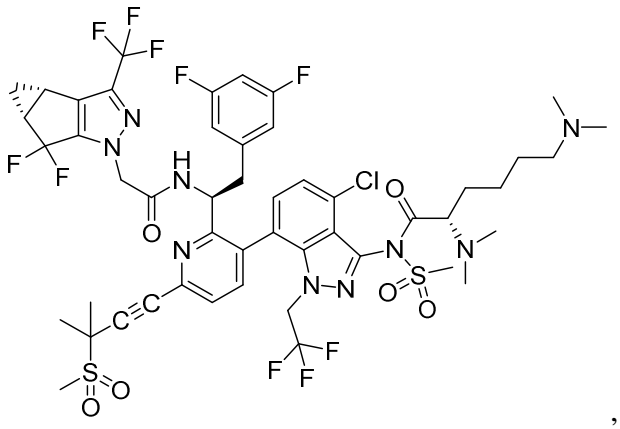
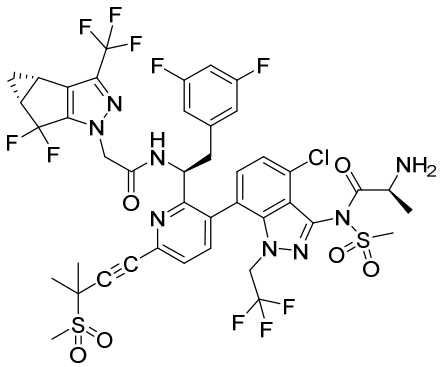
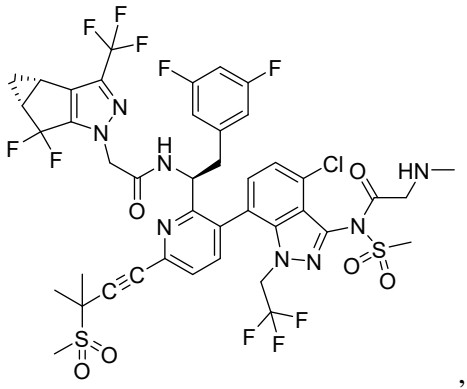
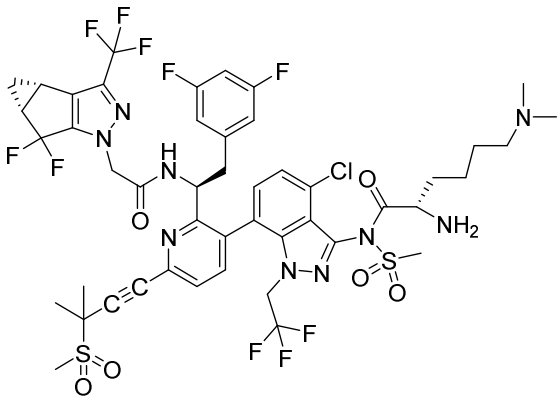
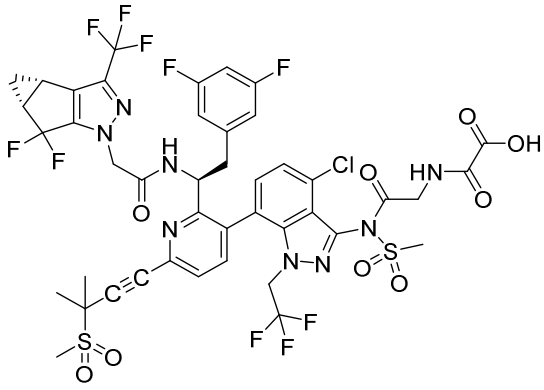
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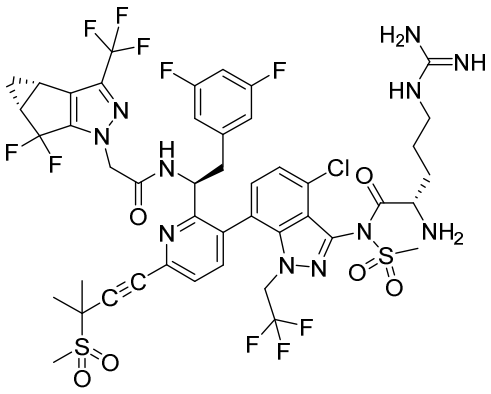
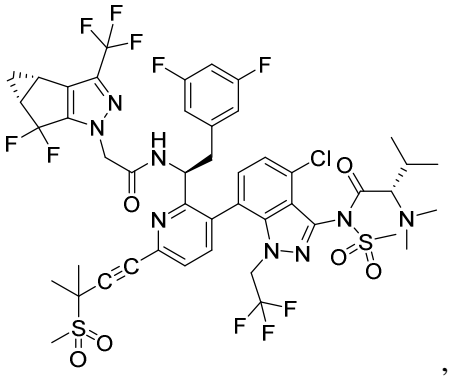
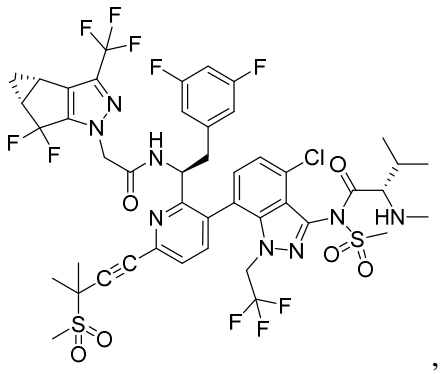
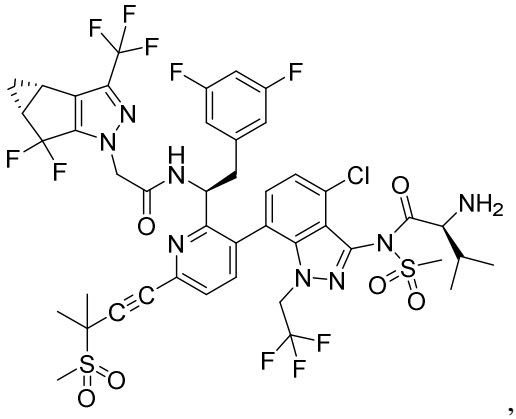
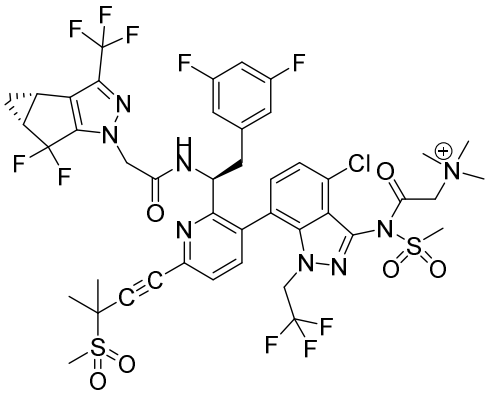
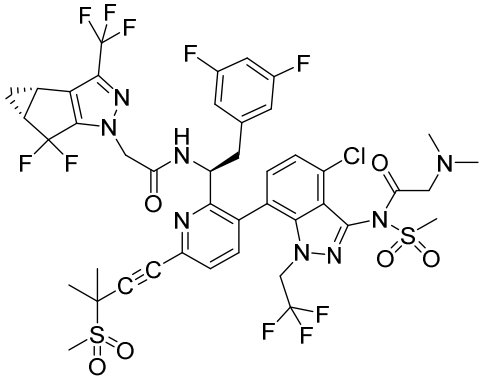

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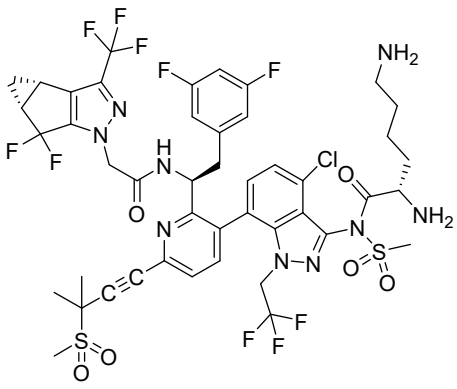
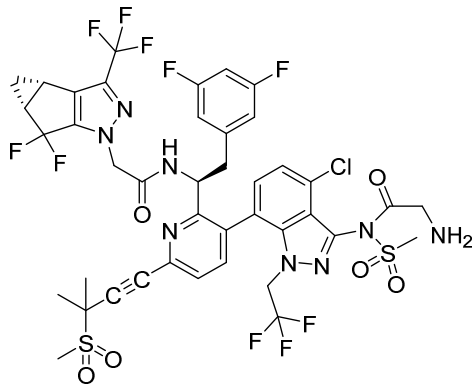
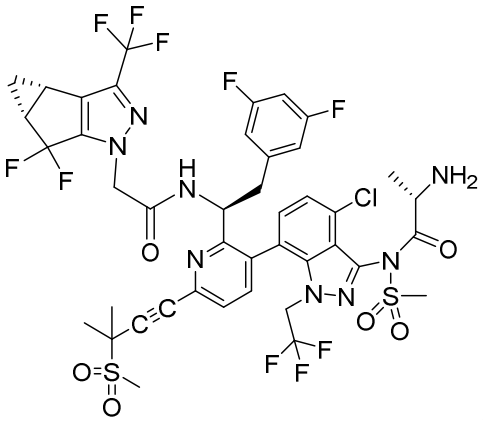

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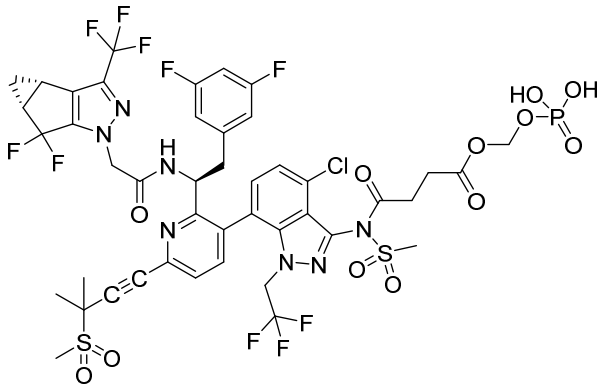
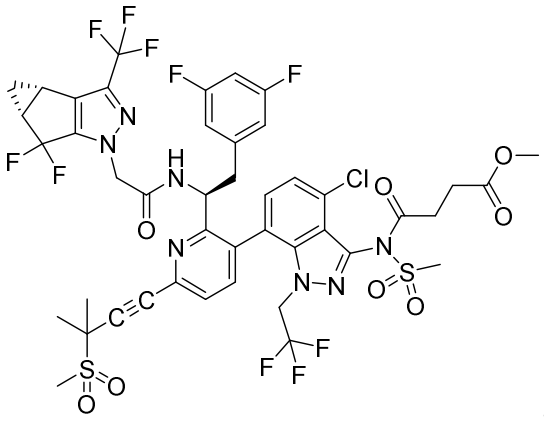

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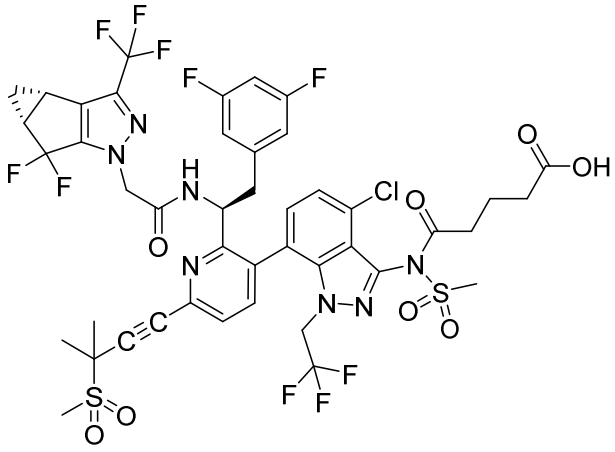
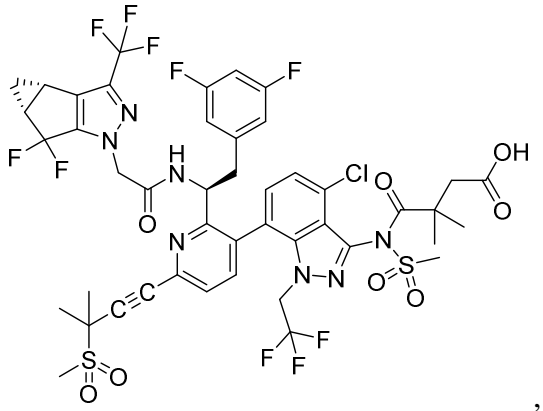
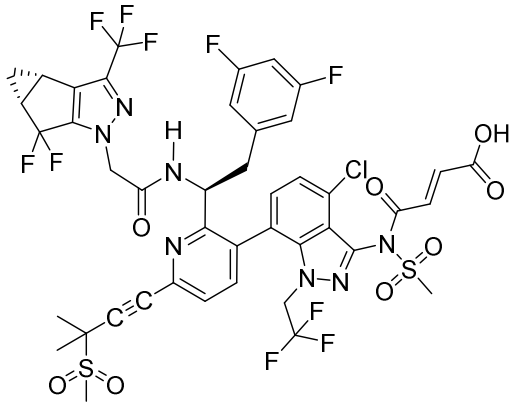
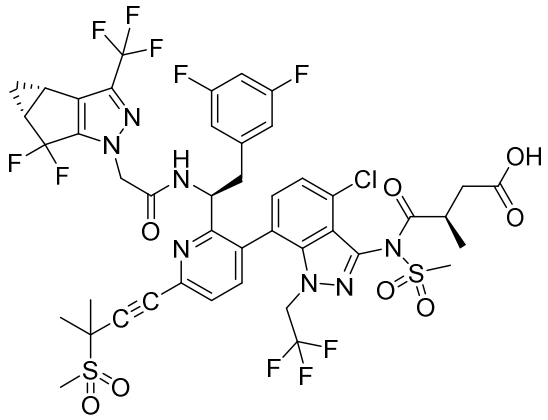
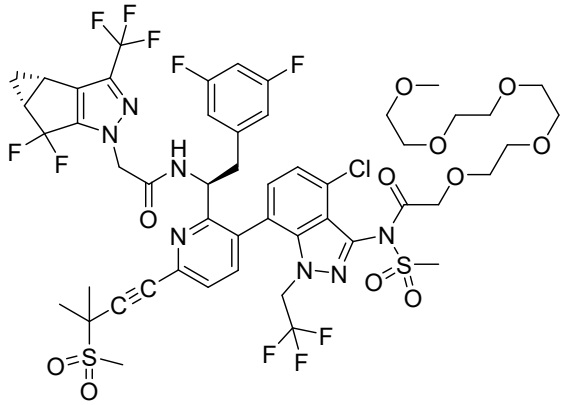
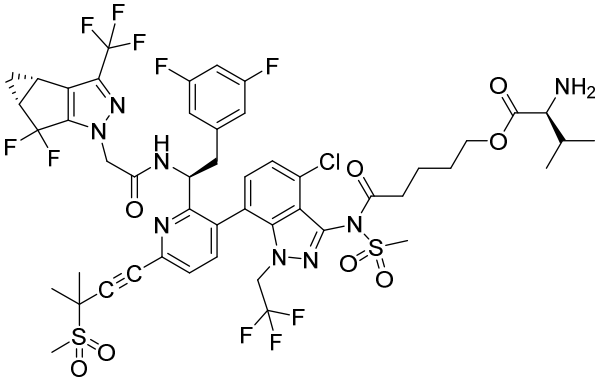

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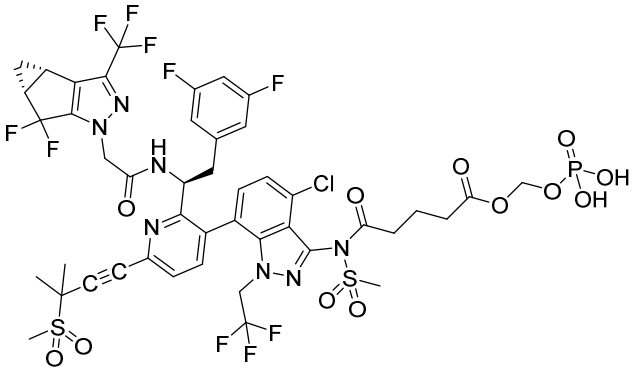
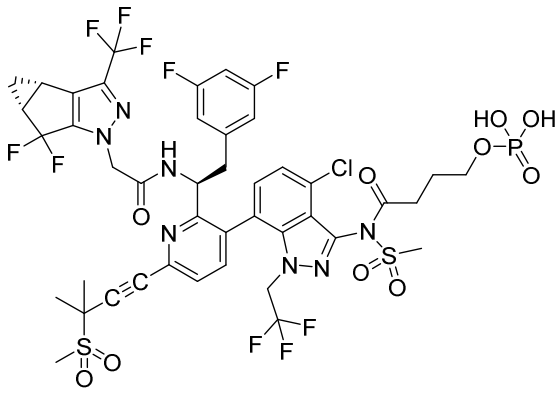
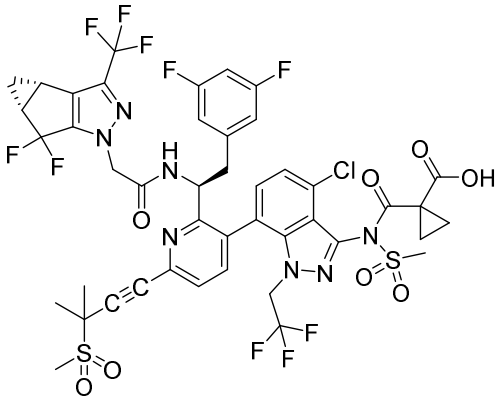

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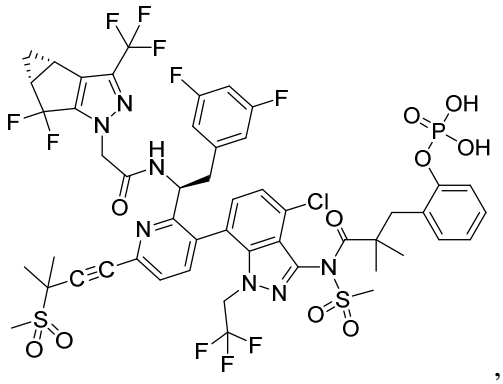
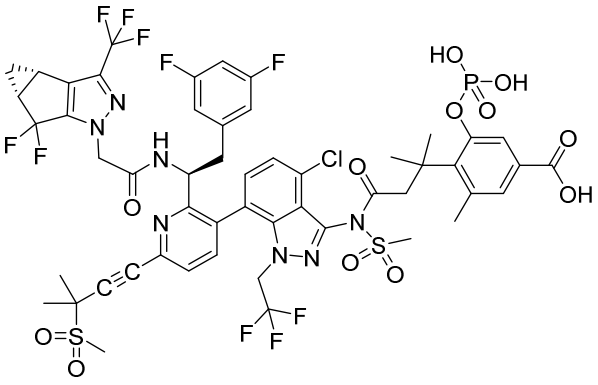

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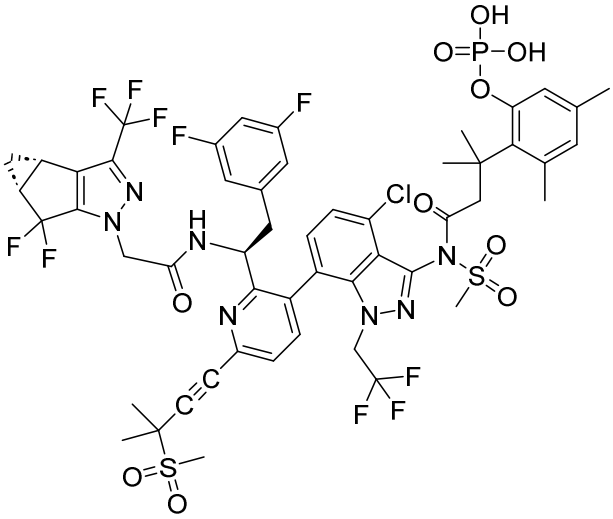
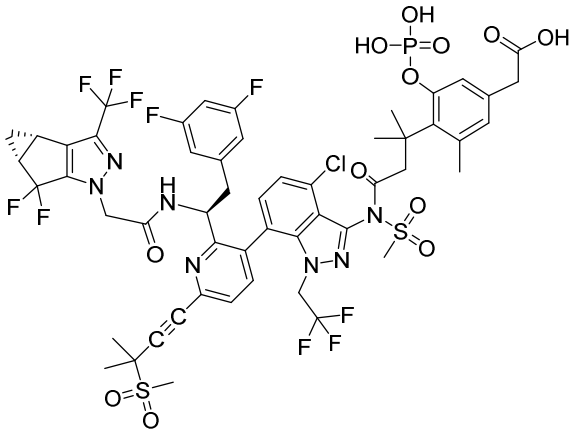
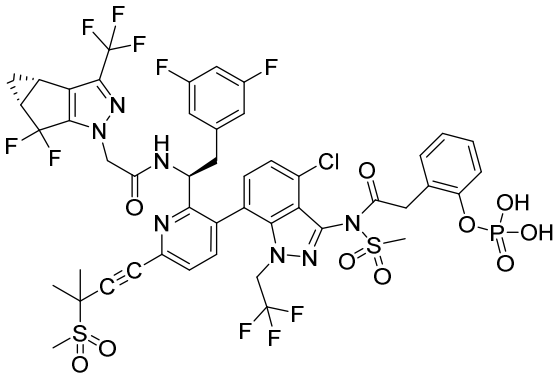
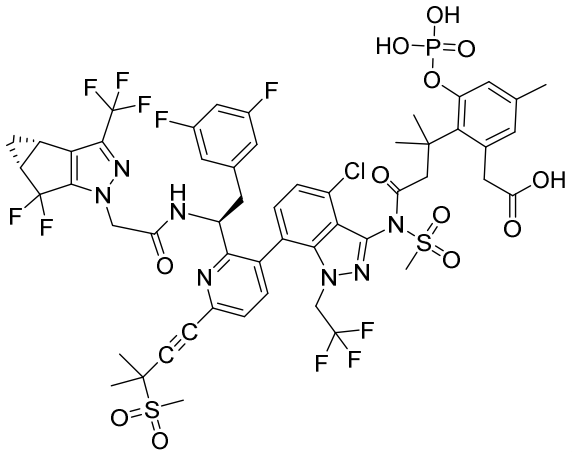
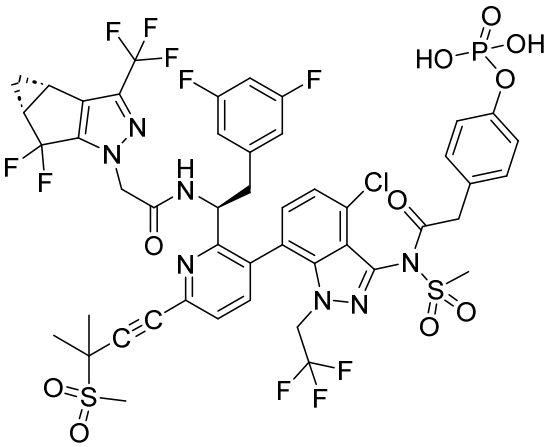
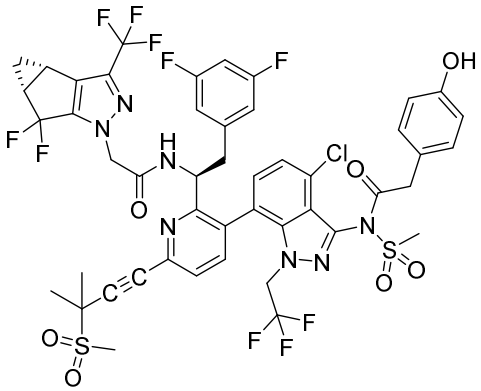

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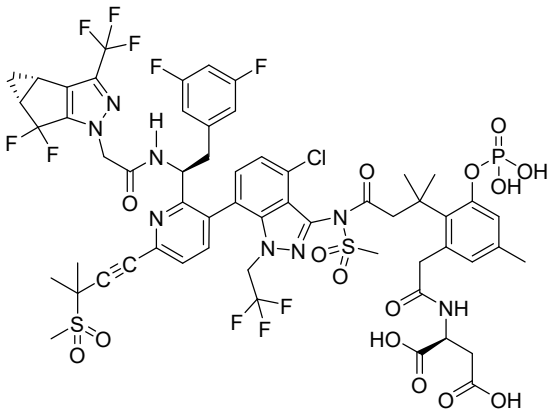
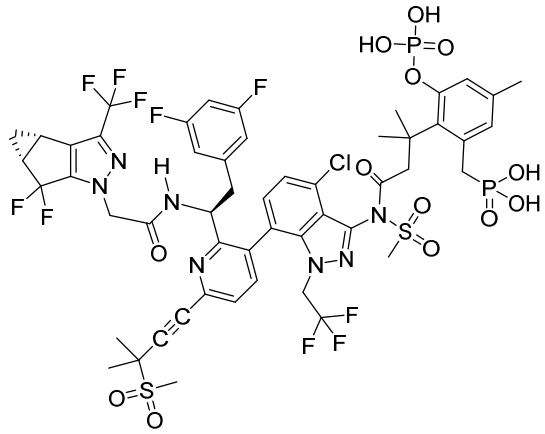
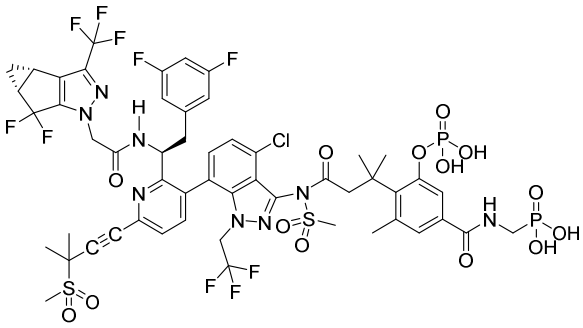
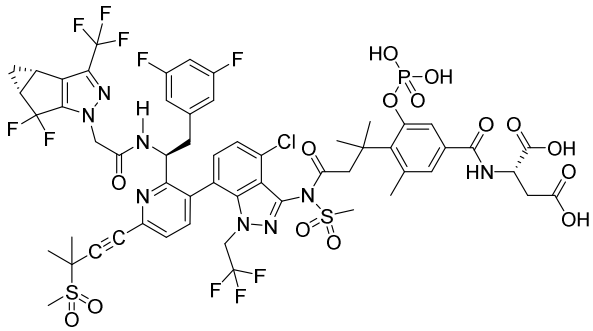
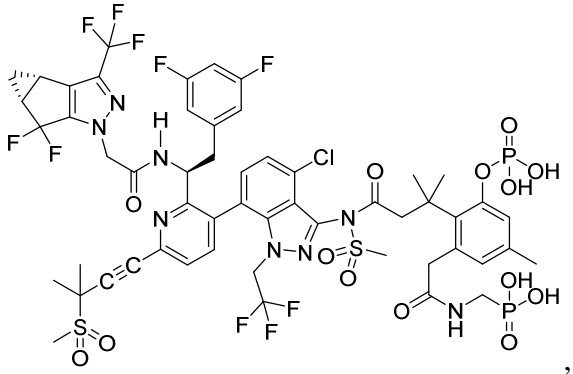
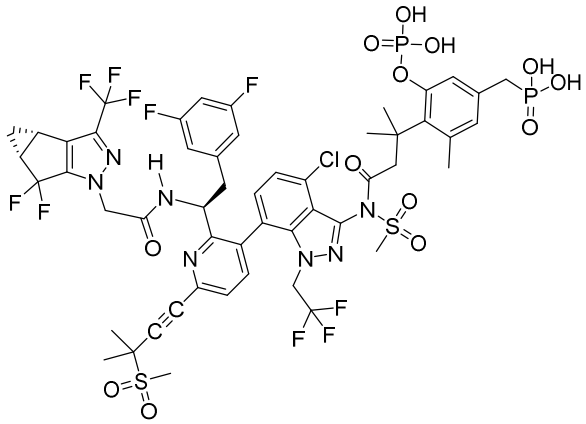
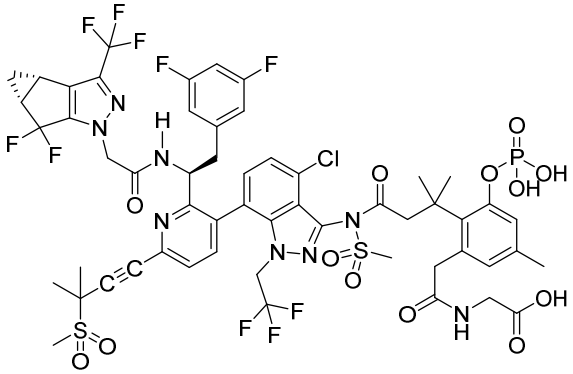
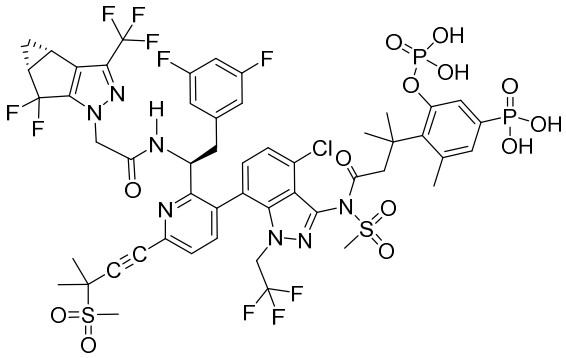

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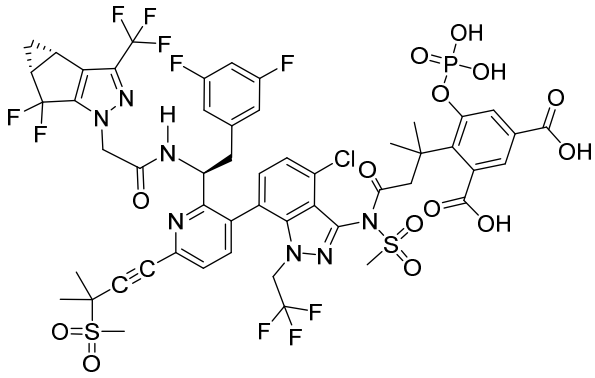
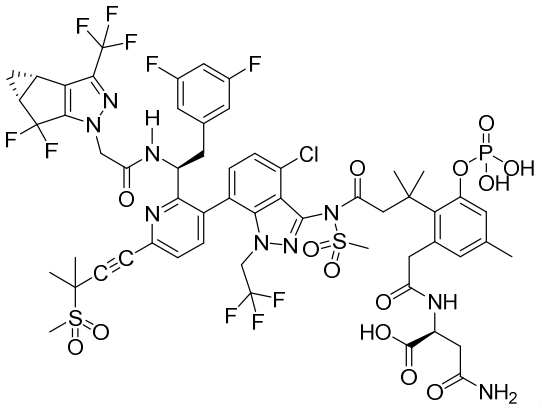
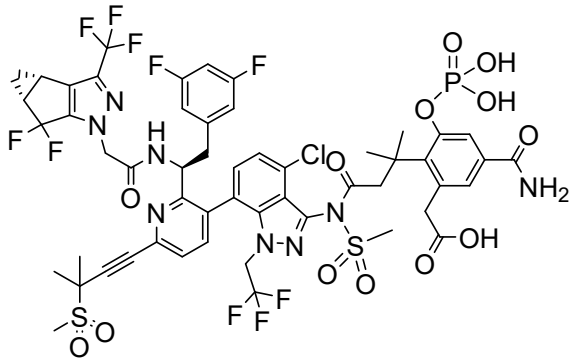
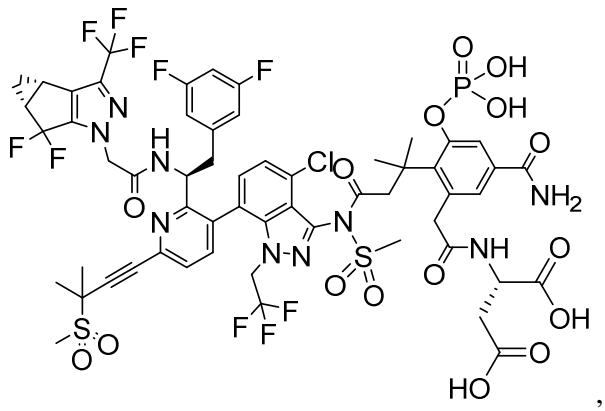
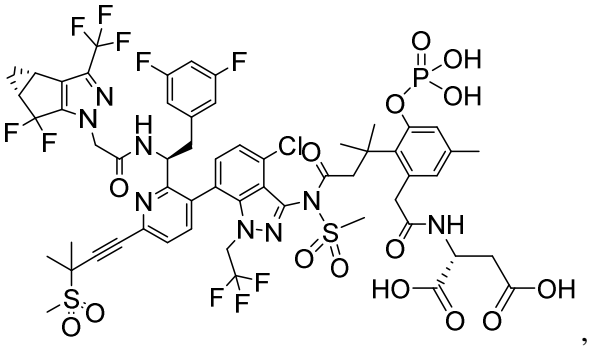
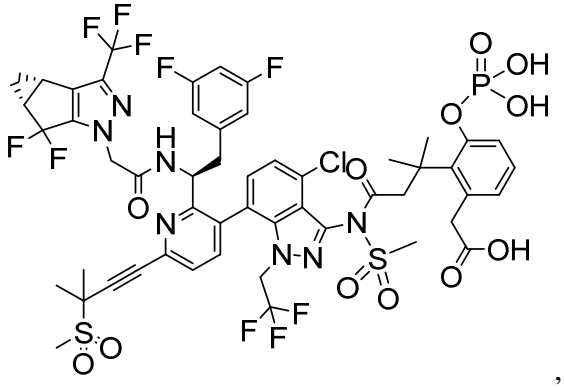
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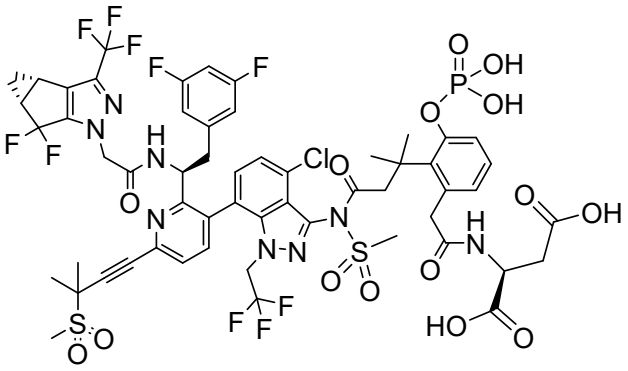
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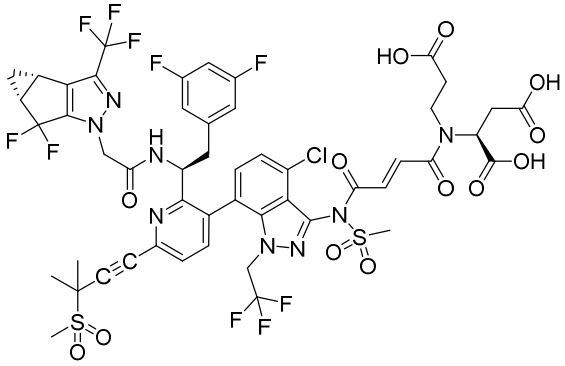

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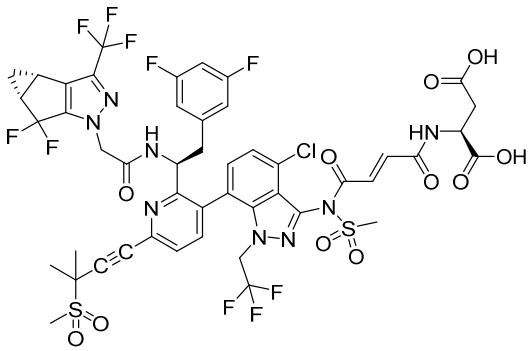
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or a pharmaceutically acceptable salt thereof.

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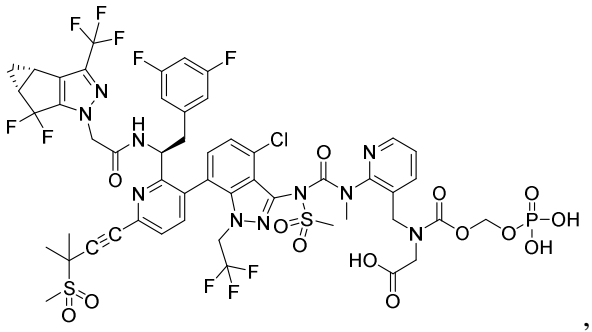
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or a pharmaceutically acceptable salt thereof.

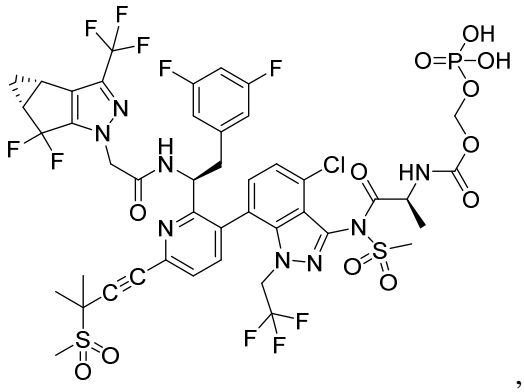
24. A compound that is



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or a pharmaceutically acceptable salt thereof.

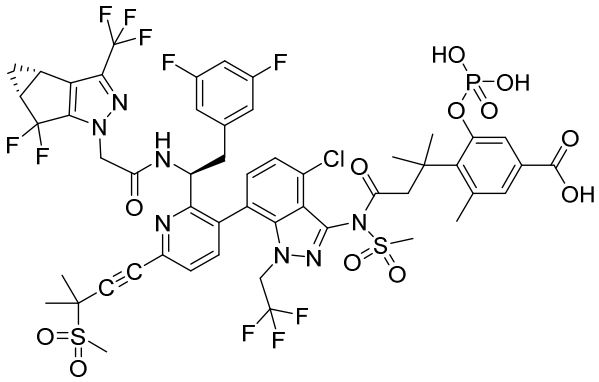
25. A compound that is



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or a pharmaceutically acceptable salt thereof.

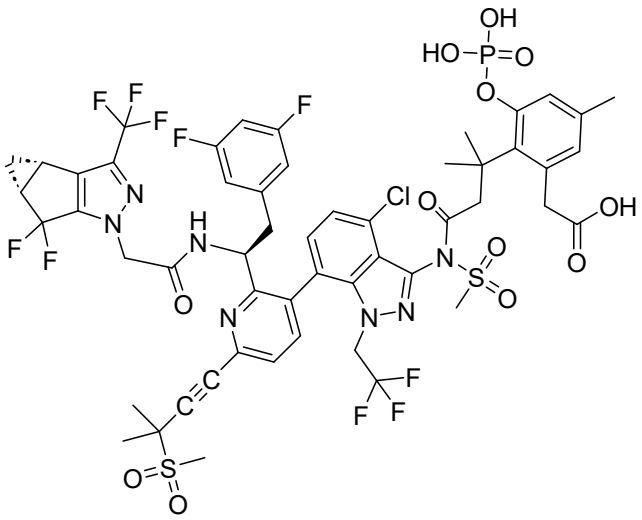
26. A compound that is



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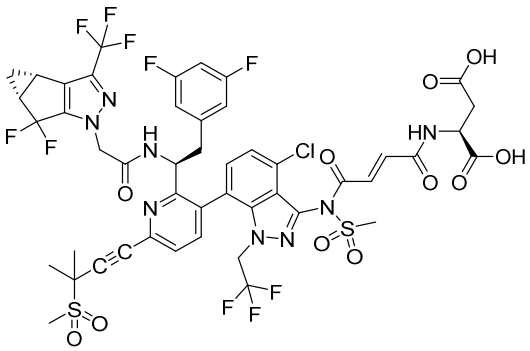
27. A compound that is



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or a pharmaceutically acceptable salt thereof.

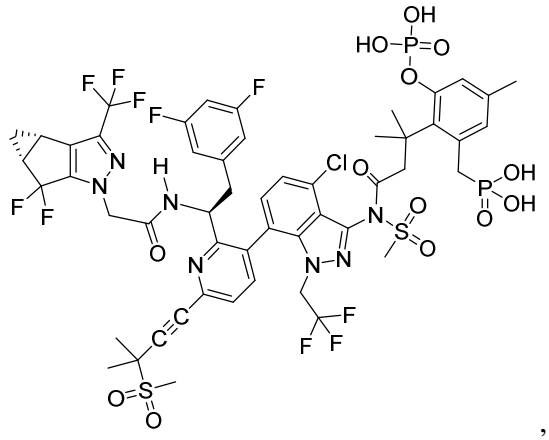
28. A compound that is



,

or a pharmaceutically acceptable salt thereof.

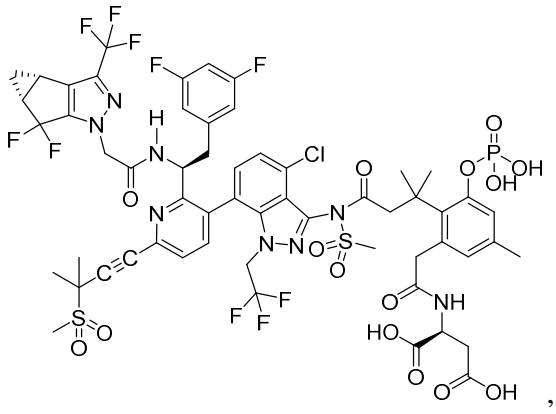
29. A compound that is



,

or a pharmaceutically acceptable salt thereof.

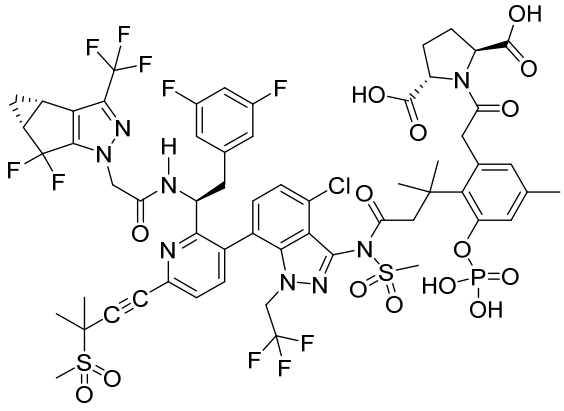
30. A compound that is



,

or a pharmaceutically acceptable salt thereof.

31. A compound that is



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or a pharmaceutically acceptable salt thereof.

32. A pharmaceutical composition comprising a therapeutically effective amount of a compound of any one of claims 1-31, or a pharmaceutically acceptable salt thereof, and a pharmaceutically acceptable excipient.

33. The pharmaceutical composition of claim 32, further comprising one, two, three, or four additional therapeutic agents.

34. The pharmaceutical composition of claim 33, wherein the additional therapeutic agents are selected from the group consisting of combination drugs for HIV, other drugs for treating HIV, HIV protease inhibitors, HIV non-nucleoside or non-nucleotide inhibitors of reverse transcriptase, HIV nucleoside or nucleotide inhibitors of reverse transcriptase, HIV integrase inhibitors, HIV non-catalytic site (or allosteric) integrase inhibitors, HIV entry inhibitors, HIV maturation inhibitors, HIV capsid inhibitors, nucleocapsid protein 7 (NCp7) inhibitors, HIV Tat or Rev inhibitors, inhibitors of Tat-TAR-P-TEFb, immunomodulators, immunotherapeutic agents, antibody-drug conjugates, gene modifiers, gene editors (such as CRISPR/Cas9, zinc finger nucleases, homing nucleases, synthetic nucleases, TALENs), cell therapies (such as chimeric antigen receptor T-cell, CAR-T, and engineered T-cell receptors, TCR-T, autologous T-cell therapies, engineered B cells, NK cells), latency reversing agents, immune-based therapies, phosphatidylinositol 3-kinase (PI3K) inhibitors, HIV antibodies, bispecific antibodies and "antibody-like" therapeutic proteins, HIV p17 matrix protein inhibitors, IL-13 antagonists, peptidyl-prolyl cis-trans isomerase A modulators, protein disulfide isomerase inhibitors, complement C5a receptor antagonists, DNA methyltransferase inhibitor, Fatty acid synthase inhibitor, HIV vif gene modulators, Vif dimerization antagonists, HIV-1 viral infectivity factor inhibitors, HIV-1 Nef modulators, TNF alpha ligand inhibitors, HIV Nef inhibitors, Hck tyrosine kinase modulators, mixed lineage kinase-3 (MLK-3) inhibitors, HIV-1 splicing inhibitors, integrin antagonists, nucleoprotein inhibitors, splicing factor modulators, COMM domain containing protein 1 modulators, HIV ribonuclease H inhibitors, IFN antagonists, retrocyclin modulators, CD3 antagonists, CDK-4 inhibitors, CDK-6 inhibitors, CDK-9 inhibitors,

Cytochrome P450 3 inhibitors, CXCR4 modulators, dendritic ICAM-3 grabbing nonintegrin 1 inhibitors, HIV GAG protein inhibitors, HIV POL protein inhibitors, Complement Factor H modulators, ubiquitin ligase inhibitors, deoxycytidine kinase inhibitors, cyclin dependent kinase inhibitors, HPK1 (MAP4K1) inhibitors, proprotein convertase PC9 stimulators, ATP dependent RNA helicase DDX3X inhibitors, reverse transcriptase priming complex inhibitors, G6PD and NADH-oxidase inhibitors, mTOR complex 1 inhibitors, mTOR complex 2 inhibitors, P-Glycoprotein modulators, RNA polymerase modulators, TAT protein inhibitors, Prolyl endopeptidase inhibitors, Phospholipase A2 inhibitors, pharmacokinetic enhancers, HIV gene therapy, HIV vaccines, and anti-HIV peptides, or any combinations thereof.

35. The pharmaceutical composition of any one of claims 33-34, wherein the additional therapeutic agents are selected from the group consisting of combination drugs for HIV, other drugs for treating HIV, HIV protease inhibitors, HIV reverse transcriptase inhibitors, HIV integrase inhibitors, HIV non-catalytic site (or allosteric) integrase inhibitors, HIV entry (fusion) inhibitors, HIV maturation inhibitors, latency reversing agents, capsid inhibitors, immune-based therapies, PI3K inhibitors, HIV antibodies, bispecific antibodies, “antibody-like” therapeutic proteins, or any combinations thereof.

36. The pharmaceutical composition of any one of claims 33-35, wherein the additional therapeutic agents are selected from the group consisting of dolutegravir, cabotegravir, darunavir, bictegravir, elsulfavirine, rilpivirine, abacavir sulfate, tenofovir, tenofovir disoproxil, tenofovir disoproxil fumarate, tenofovir disoproxil hemifumarate, tenofovir alafenamide, and tenofovir alafenamide hemifumarate, or a pharmaceutically acceptable salt thereof.

37. Use of a compound of any one of claims 1-31, or a pharmaceutically acceptable salt thereof, or a pharmaceutical composition of any one of claims 32-36, in the manufacture of a medicament for treating or preventing a human immunodeficiency virus (HIV) infection in a patient in need thereof.

38. Use of a compound of any one of claims 1-31, or a pharmaceutically acceptable salt

thereof, or a pharmaceutical composition of any one of claims 32-36, in the manufacture of a medicament for treating a human immunodeficiency virus (HIV) infection in a heavily treatment-experienced patient.

39. The use of claim 37 or claim 38, wherein the treating further comprises administering a therapeutically effective amount of one, two, three, or four additional therapeutic agents, or a pharmaceutically acceptable salt thereof.

40. The use of claim 39, wherein the one, two, three, or four additional therapeutic agents are selected from the group consisting of combination drugs for HIV, other drugs for treating HIV, HIV protease inhibitors, HIV non-nucleoside or non-nucleotide inhibitors of reverse transcriptase, HIV nucleoside or nucleotide inhibitors of reverse transcriptase, HIV integrase inhibitors, HIV non-catalytic site (or allosteric) integrase inhibitors, HIV entry inhibitors, HIV maturation inhibitors, HIV capsid inhibitors, nucleocapsid protein 7 (NCp7) inhibitors, HIV Tat or Rev inhibitors, inhibitors of Tat-TAR-P-TEFb, immunomodulators, immunotherapeutic agents, antibody-drug conjugates, gene modifiers, gene editors (such as CRISPR/Cas9, zinc finger nucleases, homing nucleases, synthetic nucleases, TALENs), cell therapies (such as chimeric antigen receptor T-cell, CAR-T, and engineered T-cell receptors, TCR-T, autologous T-cell therapies, engineered B cells, NK cells), latency reversing agents, immune-based therapies, phosphatidylinositol 3-kinase (PI3K) inhibitors, HIV antibodies, bispecific antibodies and "antibody-like" therapeutic proteins, HIV p17 matrix protein inhibitors, IL-13 antagonists, peptidyl-prolyl cis-trans isomerase A modulators, protein disulfide isomerase inhibitors, complement C5a receptor antagonists, DNA methyltransferase inhibitor, Fatty acid synthase inhibitor, HIV vif gene modulators, Vif dimerization antagonists, HIV-1 viral infectivity factor inhibitors, HIV-1 Nef modulators, TNF alpha ligand inhibitors, HIV Nef inhibitors, Hck tyrosine kinase modulators, mixed lineage kinase-3 (MLK-3) inhibitors, HIV-1 splicing inhibitors, integrin antagonists, nucleoprotein inhibitors, splicing factor modulators, COMM domain containing protein 1 modulators, HIV ribonuclease H inhibitors, IFN antagonists, retrocyclin modulators, CD3 antagonists, CDK-4 inhibitors, CDK-6 inhibitors, CDK-9 inhibitors, Cytochrome P450 3 inhibitors, CXCR4 modulators, dendritic ICAM-3 grabbing nonintegrin 1

inhibitors, HIV GAG protein inhibitors, HIV POL protein inhibitors, Complement Factor H modulators, ubiquitin ligase inhibitors, deoxycytidine kinase inhibitors, cyclin dependent kinase inhibitors, HPK1 (MAP4K1) inhibitors, proprotein convertase PC9 stimulators, ATP dependent RNA helicase DDX3X inhibitors, reverse transcriptase priming complex inhibitors, G6PD and NADH-oxidase inhibitors, mTOR complex 1 inhibitors, mTOR complex 2 inhibitors, P-Glycoprotein modulators, RNA polymerase modulators, TAT protein inhibitors, Prolyl endopeptidase inhibitors, Phospholipase A2 inhibitors, pharmacokinetic enhancers, HIV gene therapy, HIV vaccines, and anti-HIV peptides, or any combinations thereof.

41. The use of claim 39 or claim 40, wherein the one, two, three, or four additional therapeutic agents are selected from the group consisting of combination drugs for HIV, other drugs for treating HIV, HIV protease inhibitors, HIV reverse transcriptase inhibitors, HIV integrase inhibitors, HIV non-catalytic site (or allosteric) integrase inhibitors, HIV entry (fusion) inhibitors, HIV maturation inhibitors, latency reversing agents, capsid inhibitors, immune-based therapies, PI3K inhibitors, HIV antibodies, bispecific antibodies, and "antibody-like" therapeutic proteins, or any combinations thereof.

42. The use of any one of claims 39-41, wherein the one, two, three, or four additional therapeutic agents are selected from the group consisting of dolutegravir, cabotegravir, darunavir, bictegravir, elsulfavirine, rilpivirine, abacavir sulfate, tenofovir, tenofovir disoproxil, tenofovir disoproxil fumarate, tenofovir disoproxil hemifumarate, tenofovir alafenamide, and tenofovir alafenamide hemifumarate, or a pharmaceutically acceptable salt thereof.

43. The use of any one of claims 37-41, wherein the patient is a human.