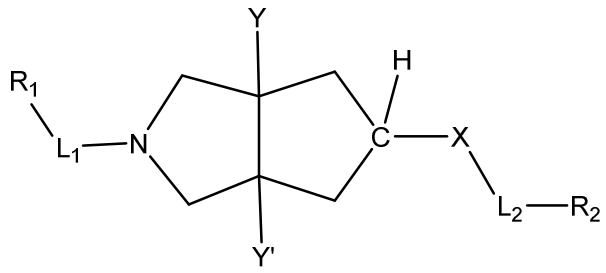
CLAIMS

1. A compound of formula I:



(I)

or a pharmaceutically acceptable salt, solvate, hydrate, tautomer, or stereoisomer thereof

wherein:

L_1 is straight or branched C_1-C_5 alkylene substituted with OH;

each R_{10} and R_{10}' is independently selected from the group consisting of H; C_1-C_6 alkyl optionally substituted with one or more substituents selected from the group consisting of OH, O-C_1-C_5 alkyl, $OPO_3^{-2}M_2$, $OP(O)(OH)_2$, OC(O)alkyl, and OC(O)O-alkyl where M is a monovalent metal cation; and cycloalkyl optionally substituted with one or more substituents selected from the group consisting of OH and O-C_1-C_5 alkyl provided that no more than one oxygen is attached to any carbon; or R_{10} and R_{10}', together with the nitrogen to which they are attached, may form a heterocycle;

R_1 is cycloalkyl, aryl, or heteroaryl, any of which optionally substituted with one or more substituents selected from the group consisting of OH, CN, halogen, -C_1-C_6alkylaryl, -O-C_1-C_6 alkylaryl, O-R_{10}, $OPO_3^{-2}M_2$,, $OP(O)(OH)_2$, SH, S-R_{10}, C_1-C_5 alkyl, branched alkyl, NH_2, NHR_{10}, $NHS(O)_2R_{10}$, $N(R_{10})(R_{10}')$, and $NHCOR_{10}$ where M is a monovalent metal cation;

X is selected from O, S, -S(O)-, and -$S(O)_2$-;

Y and Y' are independently H, halogen, or C_1-C_5 alkyl;

L_2 is a bond, -$(CH_2)_n$- or -$(CHR_{11})_n$-;

each R_{11} is independently selected from the group consisting of H, -C_1-C_5 alkylenyl-, -CO-C_1-C_5alkylenyl-, and –alkylenyl-CO-alkylenyl-;

R_2 is phenyl, naphthyl, heteroaryl or bicyclic heteroaryl, each of which is optionally substituted with one or more substituents selected from the group consisting of halogen, OH, C_1-

C_6 alkyl, OR_{10}, CN, NH_2, NHR_{10}, $N(R_{10})(R_{10}')$, -nitro, SH, SR_{10}, SOR_{10}, SO_2R_{10}, SO_2NHR_{10}, $SO_2N(R_{10})(R_{10}')$, $CONH_2$, $CONR_{10}$, and $CON(R_{10})(R_{10}')$; and

n is 1, 2, or 3.

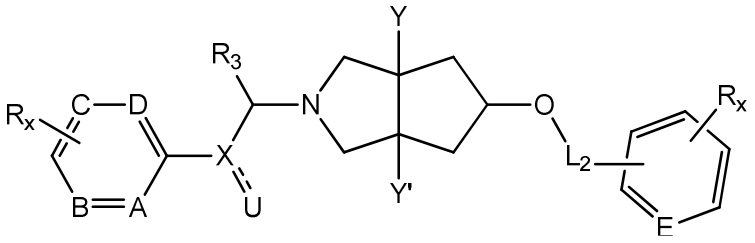
2. The compound of claim 1, or a pharmaceutically acceptable salt, solvate, hydrate, tautomer, or stereoisomer thereof, wherein L_2 is a bond and R_2 is phenyl optionally substituted with one or more halogen, OH, OR_{10}, CN, NH_2, NHR_{10}, $N(R_{10})(R_{10}')$, SH, SR_{10}, SOR_{10}, SO_2R_{10}, SO_2NHR_{10}, $SO_2N(R_{10})(R_{10}')$, $CONH_2$, $CONR_{10}$, $CON(R_{10})(R_{10}')$.

3. The compound of claim 2, or a pharmaceutically acceptable salt, solvate, hydrate, tautomer, or stereoisomer thereof, wherein X is O.

4. The compound of claim 2, or a pharmaceutically acceptable salt, solvate, hydrate, tautomer, or stereoisomer thereof, wherein R_1 is aryl or heteroaryl each of which is substituted with one or more substituents selected from the group consisting of OH, halogen, OR_{10}, SH, SR_{10}, NH_2, NHR_{10} and $NHCOR_{10}$.

5. The compound of claim 2, or a pharmaceutically acceptable salt, solvate, hydrate, tautomer, or stereoisomer thereof, wherein Y and Y' are hydrogen.

6. A compound of formula Ia:



(Ia)

or a pharmaceutically acceptable salt, solvate, hydrate, tautomer, or stereoisomer thereof

wherein:

A, B, C, D, and E are independently N or CR_x;

------- is an optional double bond;

X is CH or C;

U is OH or O;

Y and Y' are independently H, halogen, or C_1-C_6 alkyl;

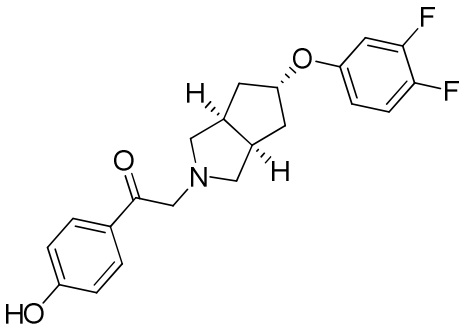
R_3 is H;

each R_x is independently H, C_1-C_6 alkyl, halogen, -OH, -$NHS(O)_2R_{10}$, or -OC_1-C_6 alkyl;

R_{10} is independently selected from the group consisting of H; C_1-C_6 alkyl optionally substituted with one or more substituents selected from the group consisting of OH, O-C_1-C_5 alkyl, $OPO_3^{-2}M_2$, $OP(O)(OH)_2$, OC(O)alkyl, and OC(O)O-alkyl where M is a monovalent metal cation; and cycloalkyl optionally substituted with one or more substituents selected from the group consisting of OH and O-C_1-C_5 alkyl provided that no more than one oxygen is attached to any carbon; and

L_2 is a bond or $(CH_2)_n$, wherein n is 1 or 2.

7. A compound, or a pharmaceutically acceptable salt, solvate, hydrate, tautomer, or stereoisomer thereof, selected from the group consisting of: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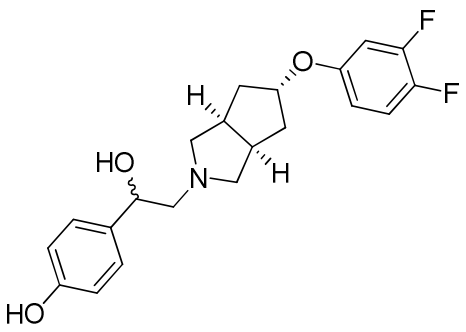
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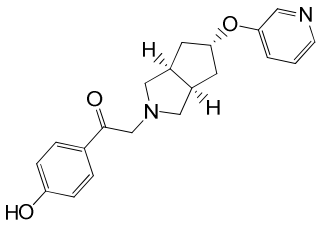
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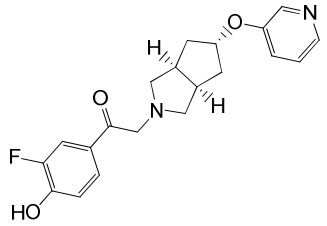
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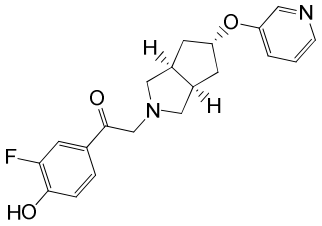
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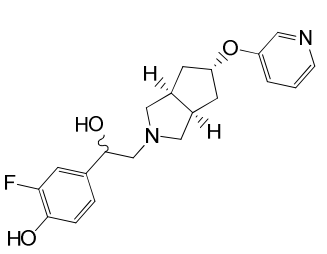
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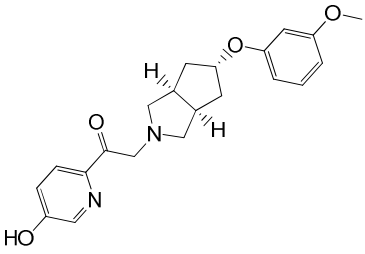
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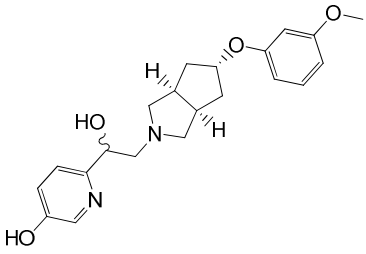
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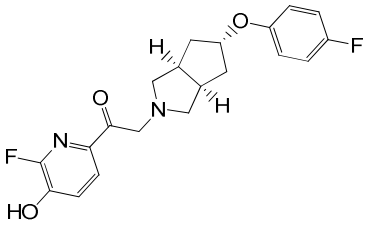
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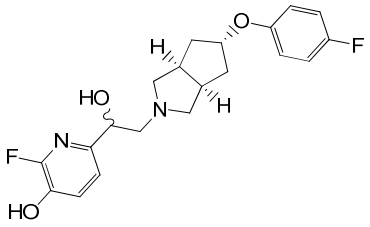
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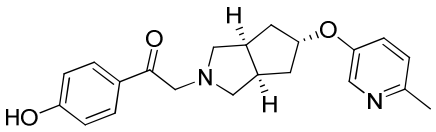
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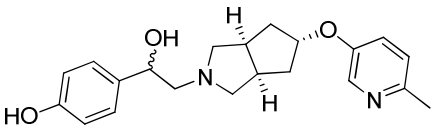
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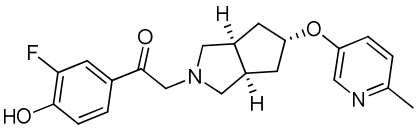
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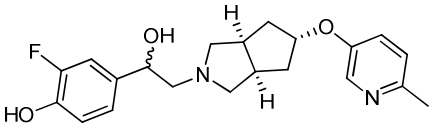
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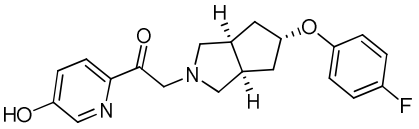
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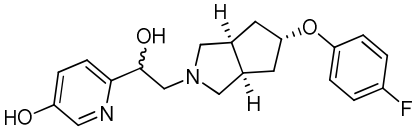
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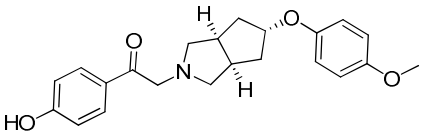
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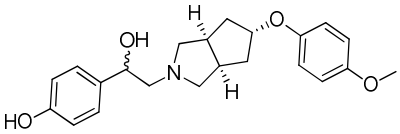
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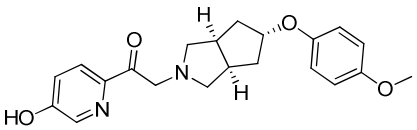
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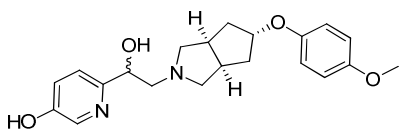
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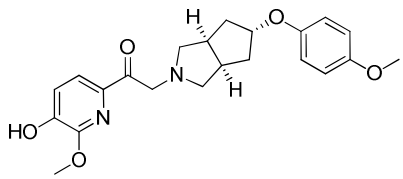
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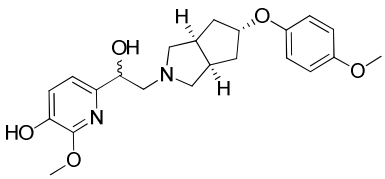
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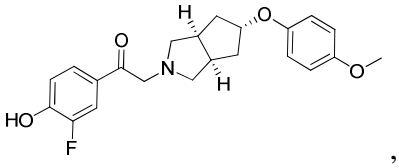
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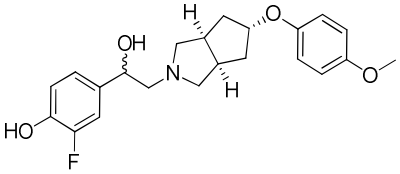
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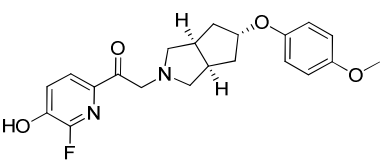
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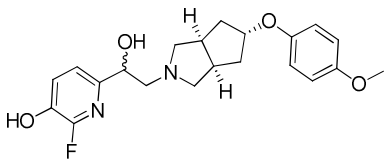
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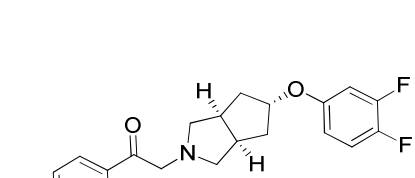
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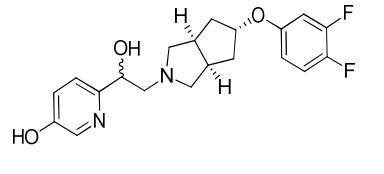
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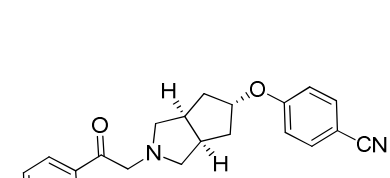
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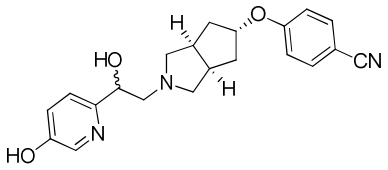
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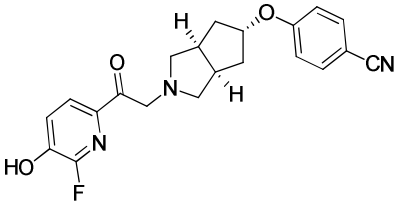
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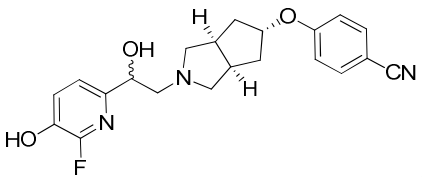
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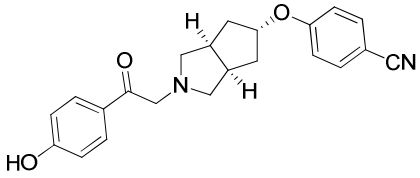
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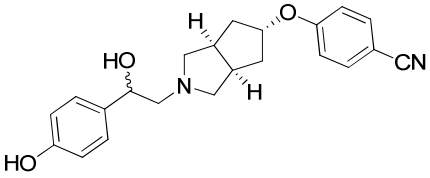
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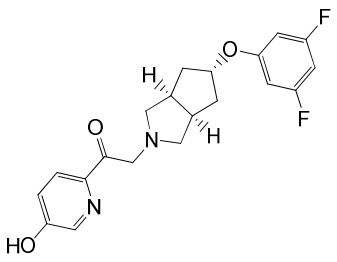
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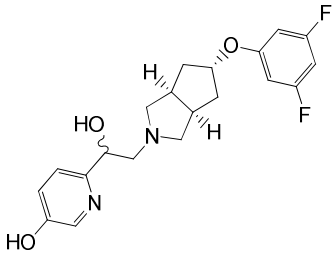
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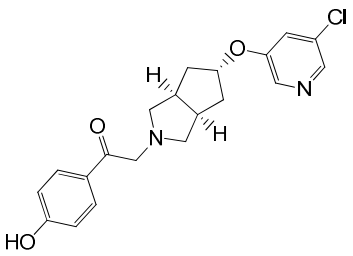
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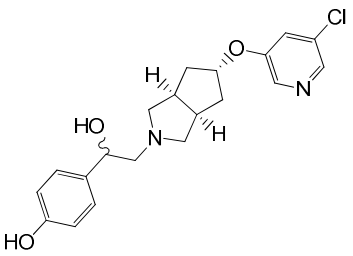
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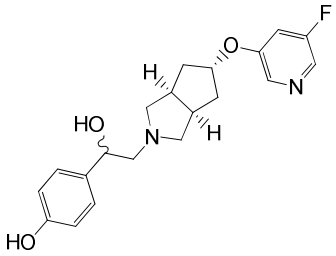
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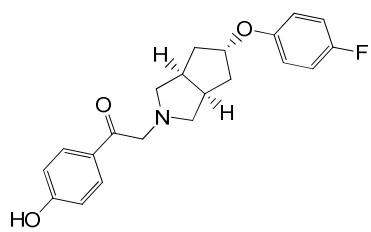
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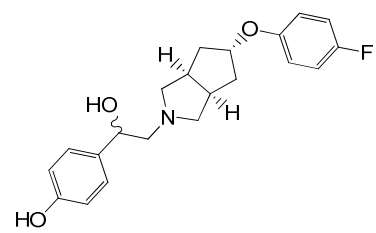
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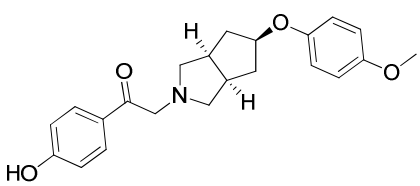
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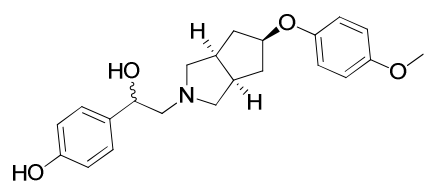
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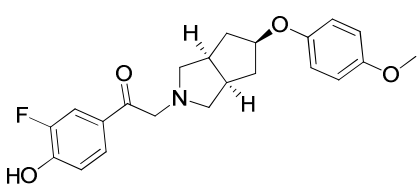
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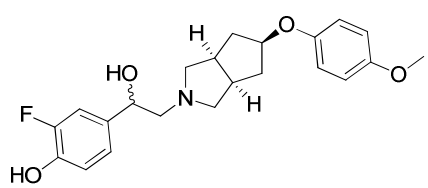
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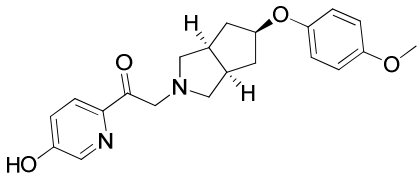
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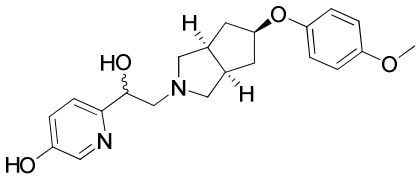
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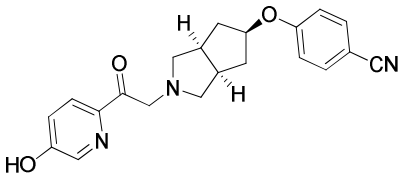
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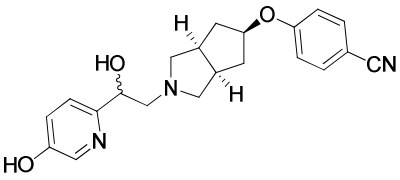
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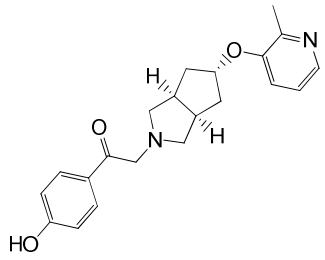
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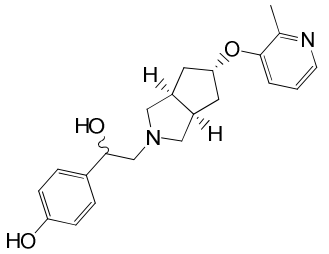
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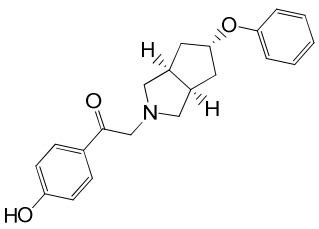
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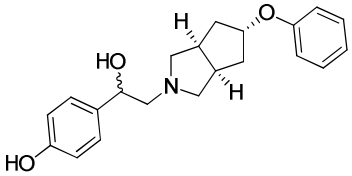
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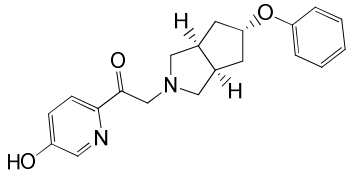
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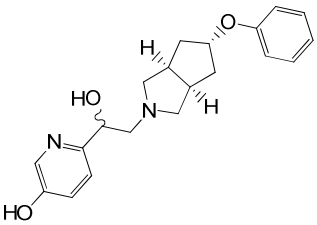
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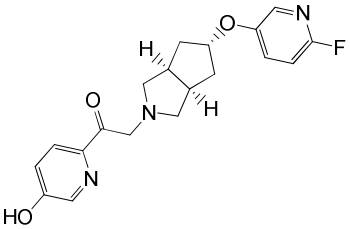
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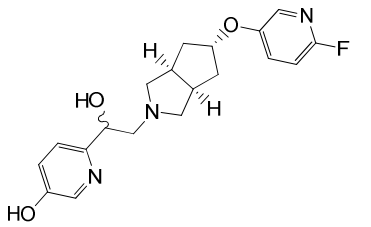
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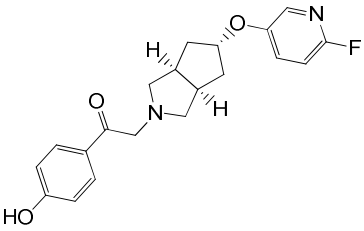
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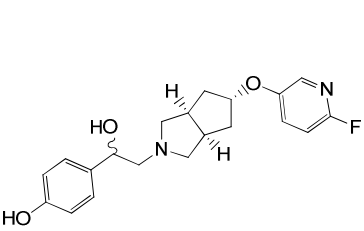
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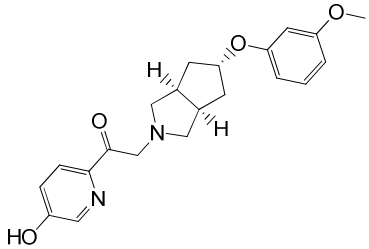
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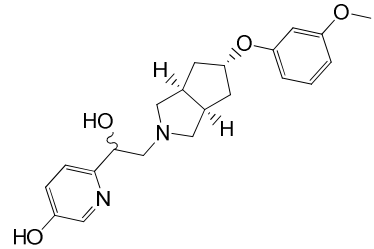
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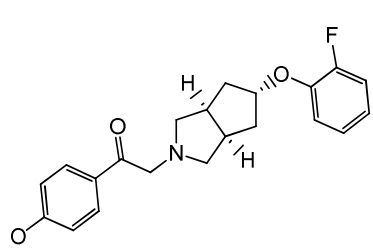
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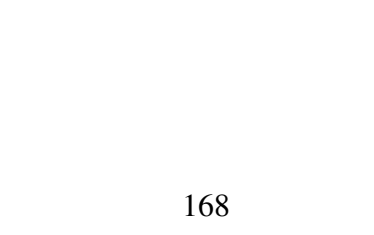
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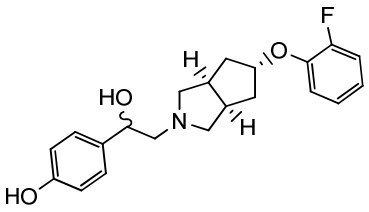
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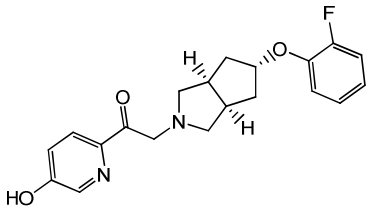
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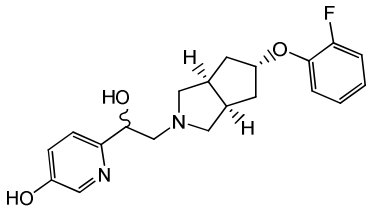
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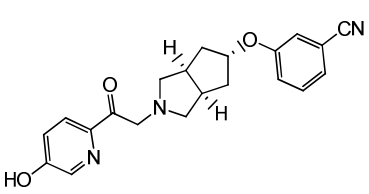
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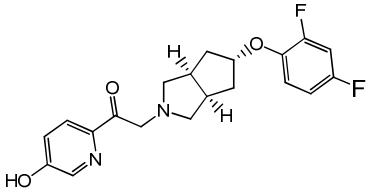
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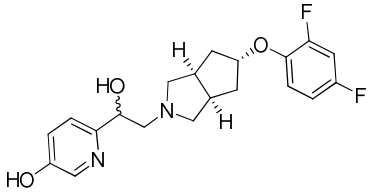
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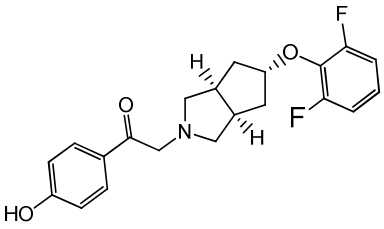
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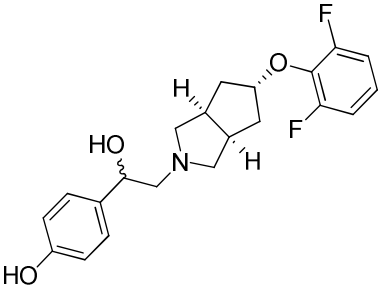
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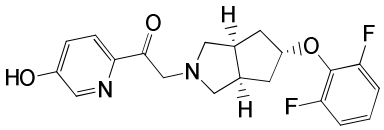
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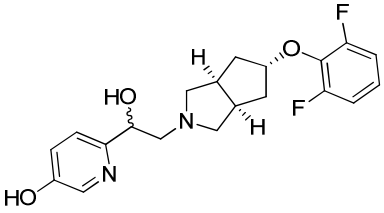
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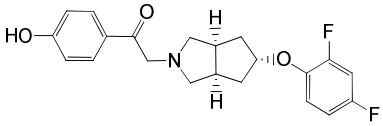
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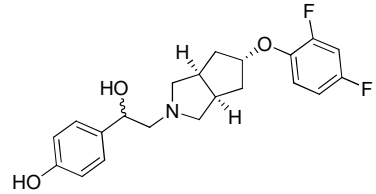
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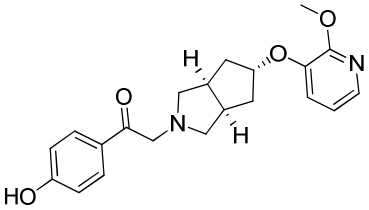
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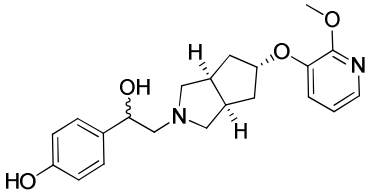
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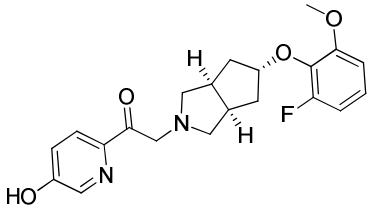
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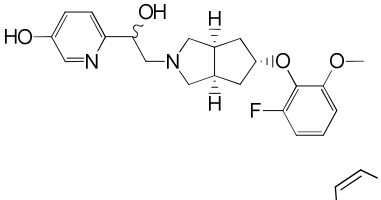
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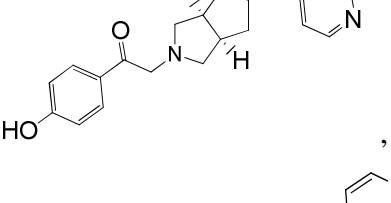
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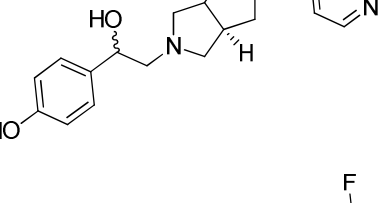
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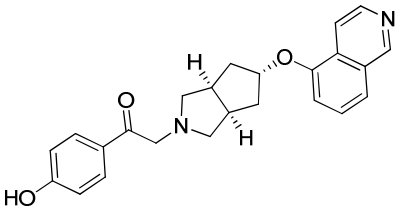
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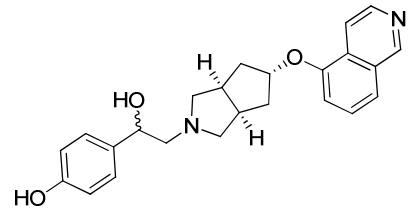
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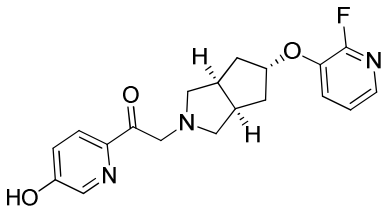
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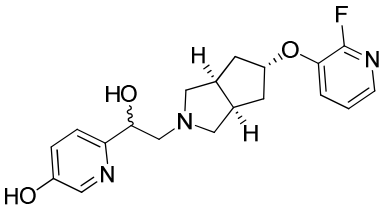
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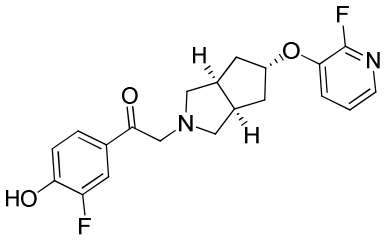
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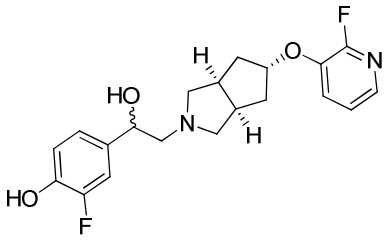
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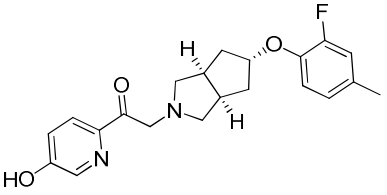
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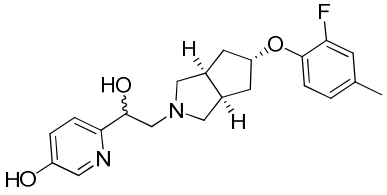
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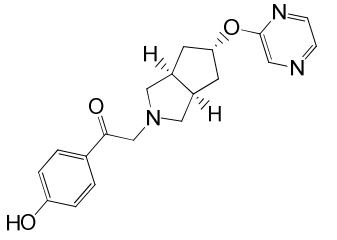
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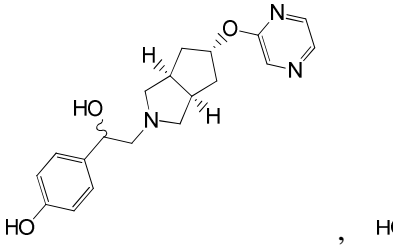
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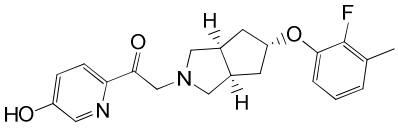
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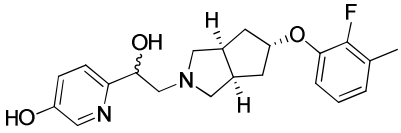
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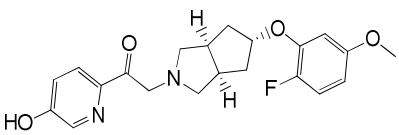
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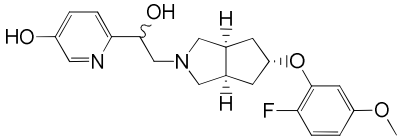
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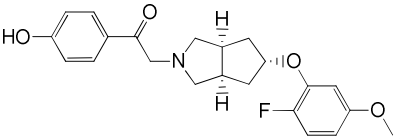
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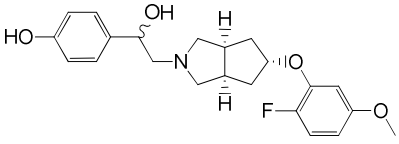
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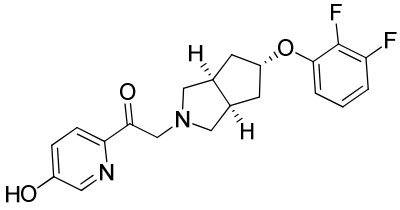
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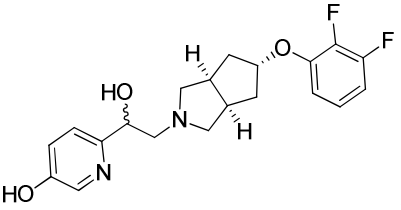
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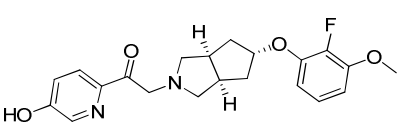
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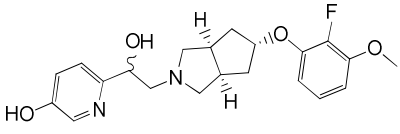
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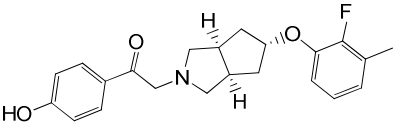
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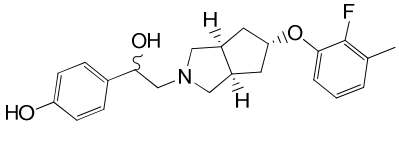
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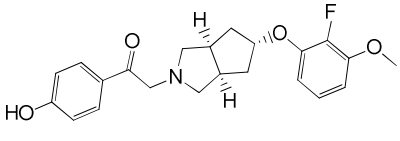
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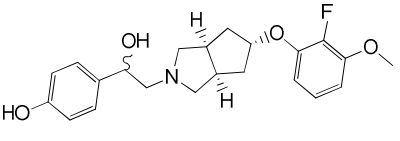
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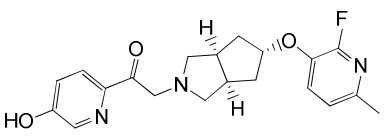
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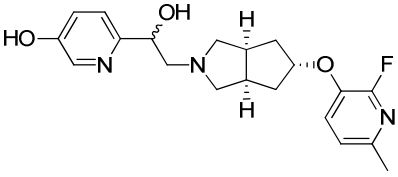
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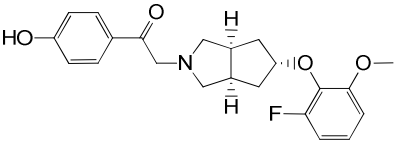
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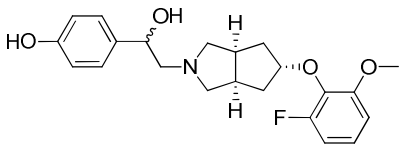
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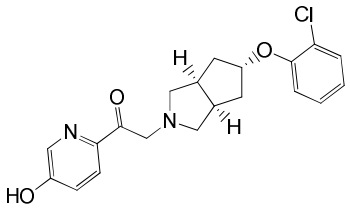
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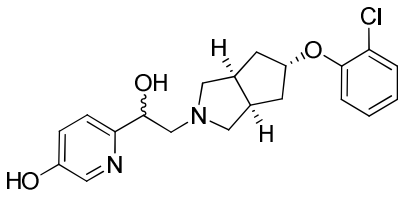
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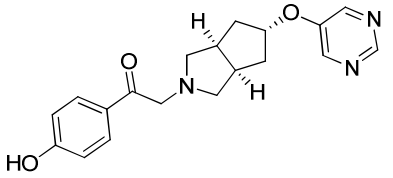
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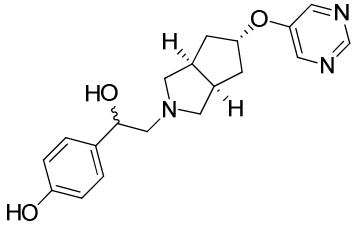
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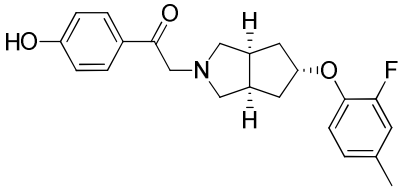
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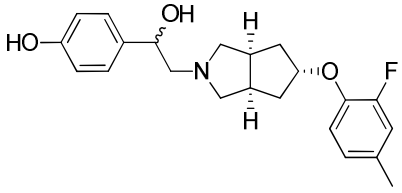
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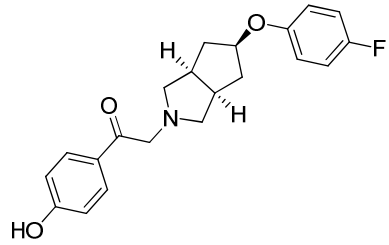
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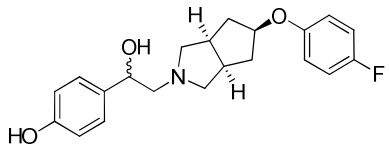
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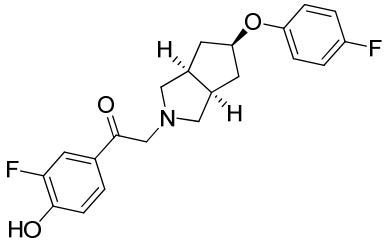
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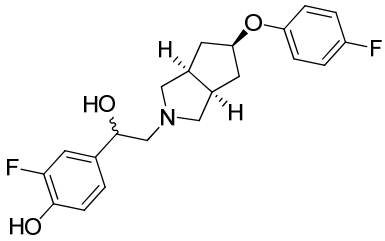
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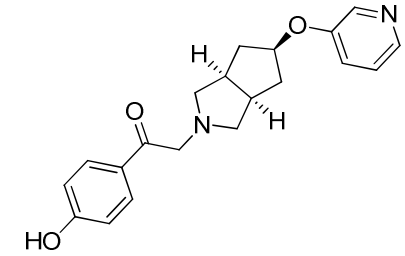
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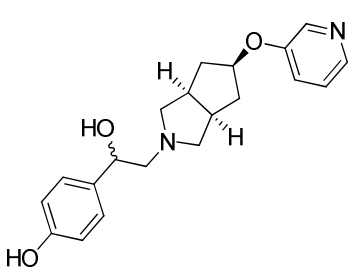
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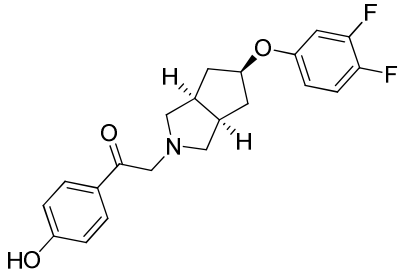
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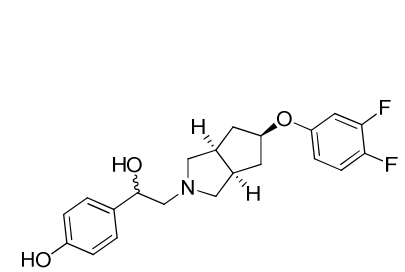
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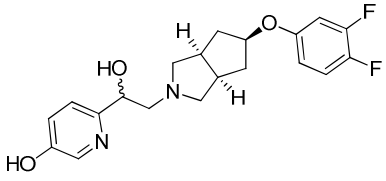
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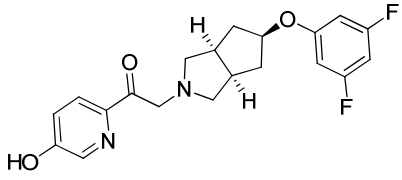
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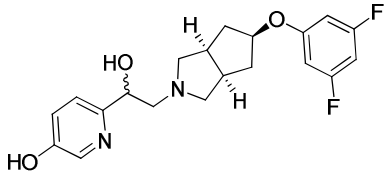
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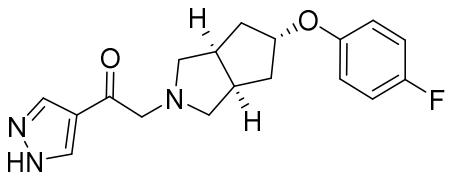
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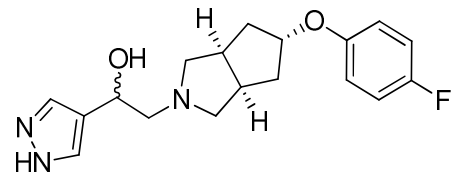
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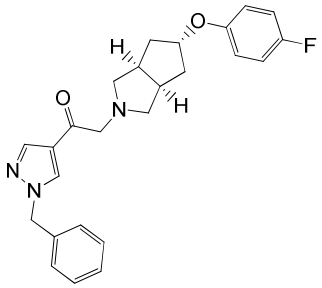
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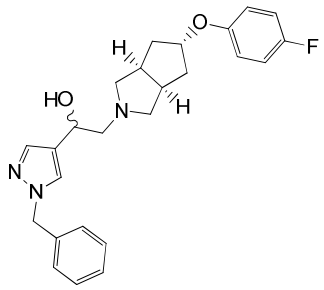
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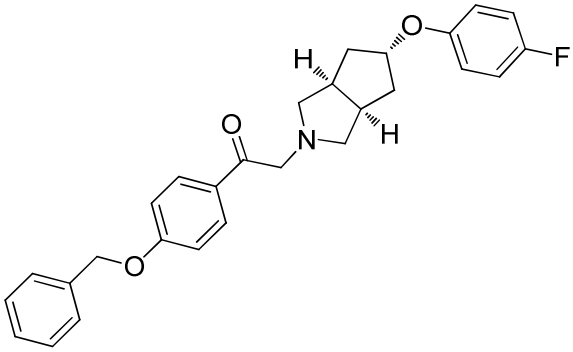
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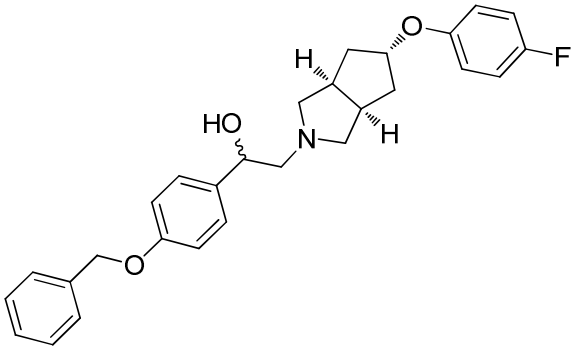
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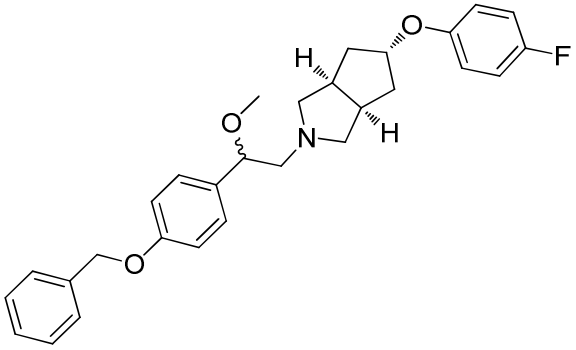
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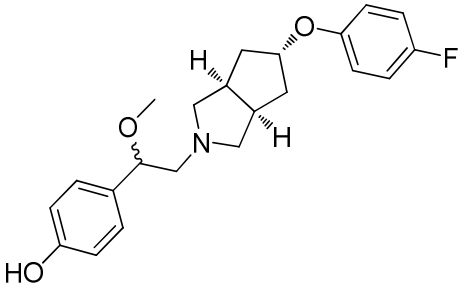
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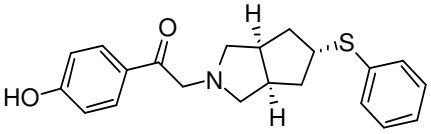
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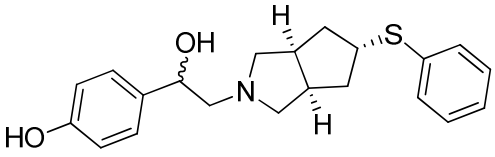
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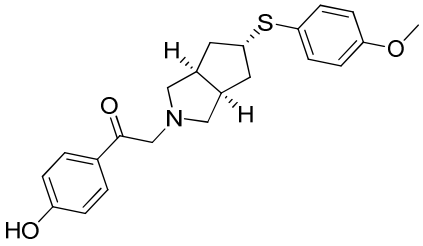
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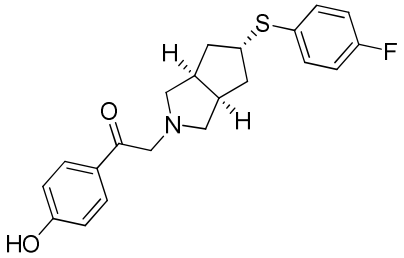
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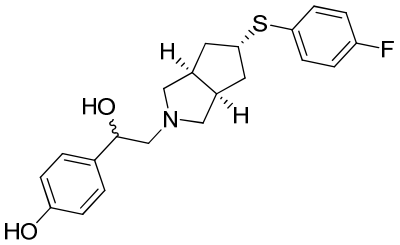
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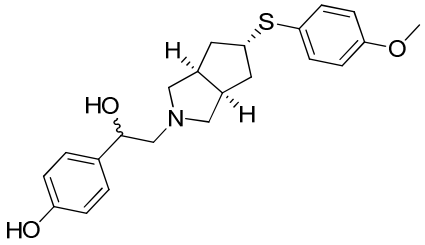
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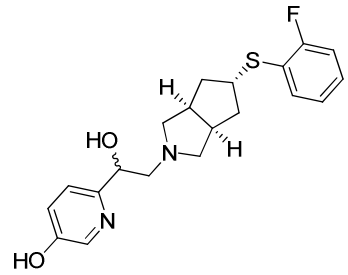
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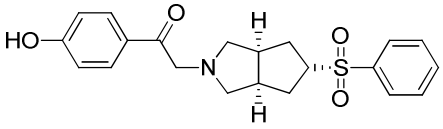
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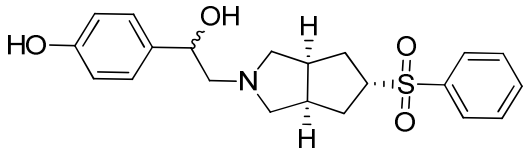
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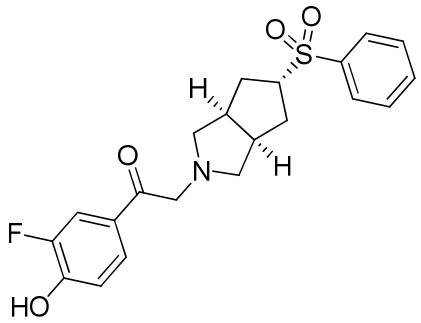
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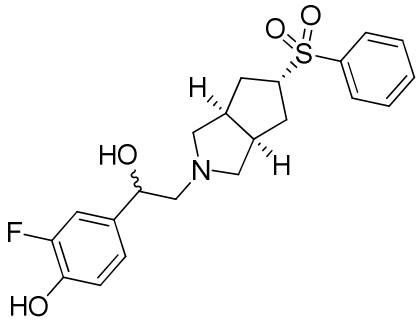
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8. A pharmaceutical composition comprising a compound of any one of claims 1 to 7 and 15 to 22, or a pharmaceutically acceptable salt, solvate, hydrate, tautomer, or stereoisomer thereof, and a pharmaceutically acceptable carrier.

9. An effective amount of a compound of any one of claims 1 to 7 and 15 to 22, or a pharmaceutically acceptable salt, solvate, hydrate, tautomer, or stereoisomer thereof, for use in the treatment of a neurological disease, an abnormal brain function, and/or an emotional disorder.

10. The use of an effective amount of a compound of any one of claims 1 to 7 and 15 to 22, or a pharmaceutically acceptable salt, solvate, hydrate, tautomer, or stereoisomer thereof, in the manufacture of a medicament for the treatment of a neurological disease, an abnormal brain function, and/or an emotional disorder, wherein the neurological disease is Parkinson's disease, the emotional disorder is selected from major depressive disorder or depression, refractory or treatment resistant depression, bipolar disorder, obsessive-compulsive disorder, post-traumatic stress syndrome, or anxiety.

11. The use of claim 10, wherein the emotional disorder is

a) major depressive disorder or depression; or

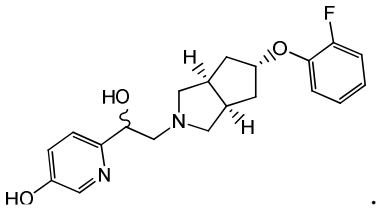
b) refractory or treatment resistant depression.

12. An effective amount of a compound of any one of claims 1 to 7 and 15 to 22, or a pharmaceutically acceptable salt, solvate, hydrate, tautomer, or stereoisomer thereof, suitable for modulating NR2B receptors.

13. The use of an effective amount of a compound of any one of claims 1 to 7 and 15 to 22, or a pharmaceutically acceptable salt, solvate, hydrate, tautomer, or stereoisomer thereof, in the manufacture of a medicament for the treatment of a neurological disease, an abnormal brain function, and/or an emotional disorder by modulating NR2B receptors, wherein the neurological disease is Parkinson's disease, the emotional disorder is selected from bipolar disorder, obsessive-compulsive disorder, post-traumatic stress syndrome, depression, refractory or treatment resistant depression, and anxiety.

14. The use of claim 13, wherein the bipolar disorder is bipolar depression.

15. The compound of claim 7, or a pharmaceutically acceptable salt, solvate, hydrate, tautomer, or stereoisomer thereof, which is



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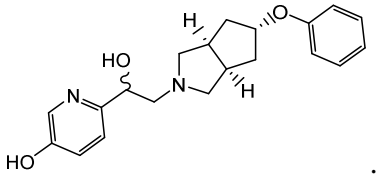
16. The compound of claim 7, or a pharmaceutically acceptable salt, solvate, hydrate, tautomer, or stereoisomer thereof, which is



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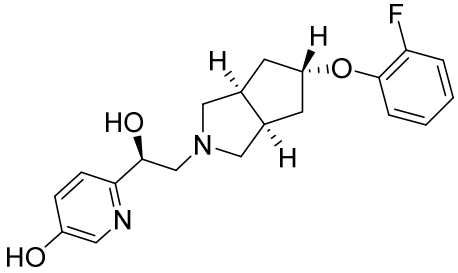
17. A compound of the following structure:



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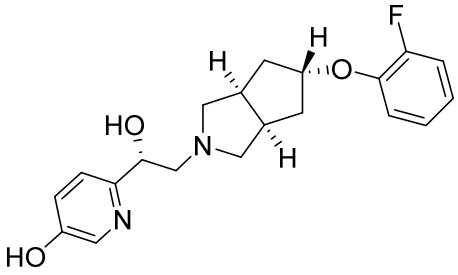
or a pharmaceutically acceptable salt, solvate, hydrate, tautomer, or stereoisomer thereof.

18. A compound of the following structure:



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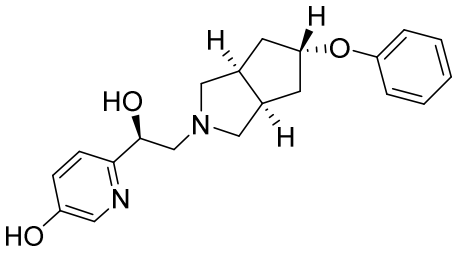
or a pharmaceutically acceptable salt, solvate, hydrate, tautomer, or stereoisomer thereof.

19. A compound of the following structure:



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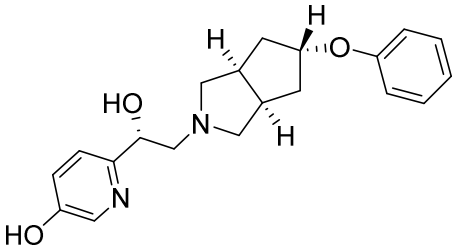
or a pharmaceutically acceptable salt, solvate, hydrate, tautomer, or stereoisomer thereof.

20. A compound of the following structure:



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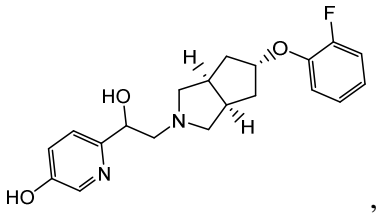
or a pharmaceutically acceptable salt, solvate, hydrate, tautomer, or stereoisomer thereof.

21. A compound of the following structure:



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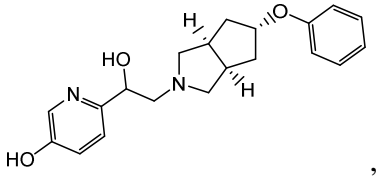
or a pharmaceutically acceptable salt, solvate, hydrate, tautomer, or stereoisomer thereof.

22. A compound of the following structure:



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or a pharmaceutically acceptable salt, solvate, hydrate, tautomer, or stereoisomer thereof.