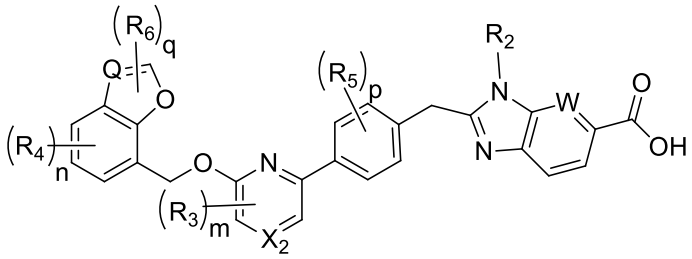
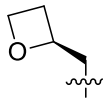
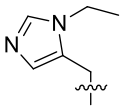
Claims

1. A compound of general formula (II) or a pharmaceutically acceptable salt, a stereoisomer, a solvate or a hydrate thereof:



formula (II)

wherein:

R_2 is selected from  or  ;

R_3 is independently selected from hydrogen atom and halogen;

R_4 is independently selected from hydrogen atom, halogen, cyano and C1-C6 alkyl, wherein the C1-C6 alkyl is further substituted by one or more halogens;

R_5 is independently selected from halogen;

R_6 is independently selected from hydrogen atom, halogen, C1-C6 alkyl, C3-C6 cycloalkyl, phenyl, furan and C2-C4 alkenyl; or two adjacent R_6 are connected to form a ring;

W is selected from N and CR_{10};

X_2 is selected from N and CR_{10};

Q is selected from N and CH;

p is selected from 0, 1, 2 or 3;

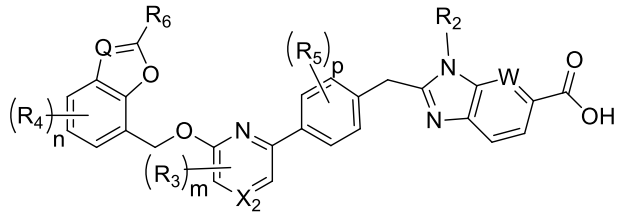
m is selected from 0, 1 or 2;

n is selected from 0, 1, 2 or 3;

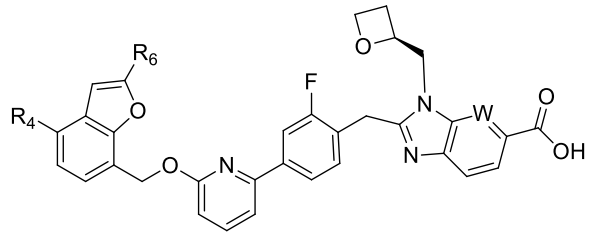
q is selected from 0, 1 or 2;

R_{10} is selected from hydrogen atom and halogen;

preferably, the compound or the pharmaceutically acceptable salt, the stereoisomer, the solvate or the hydrate thereof has a structure shown in general formula (II-1):

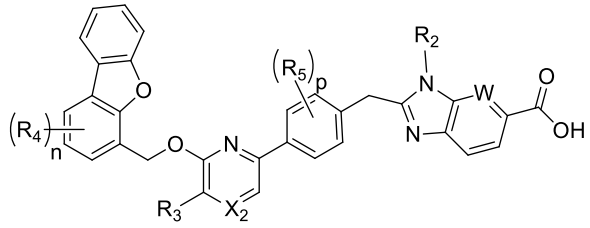


formula (II-1); further preferably, R_3 is selected from hydrogen atom and F; R_4 is selected from hydrogen atom, F, Cl, cyano, CF_3 and CHF_2; X_2 and Q are selected from CH; R_{10} is selected from hydrogen atom and F; further preferably, the compound or the pharmaceutically acceptable salt, the stereoisomer, the solvate or the hydrate thereof has a structure shown in general formula (II-1-1):

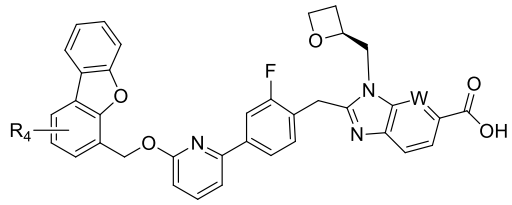


formula (II-1-1), wherein R_4 is selected from Cl and cyano; R_6 is selected from hydrogen atom and F; and R_{10} is selected from hydrogen atom;

or, preferably, the compound or the pharmaceutically acceptable salt, the stereoisomer, the solvate or the hydrate thereof has a structure shown in general formula (II-2):

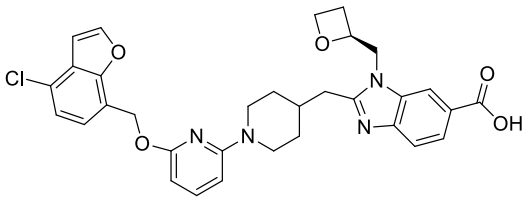


formula (II-2); further preferably, R_5 is selected from F; R_3 is selected from hydrogen atom and F; X_2 is selected from CH; R_{10} is selected from hydrogen atom and F; and further preferably, the compound or the pharmaceutically acceptable salt, the stereoisomer, the solvate or the hydrate thereof has a structure shown in general formula (II-2-1):

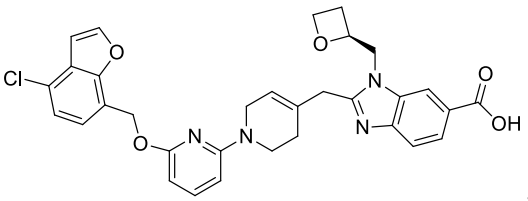


formula (II-2-1), wherein R_4 is from hydrogen atom, Cl and cyano; and R_{10} is selected from hydrogen atom.

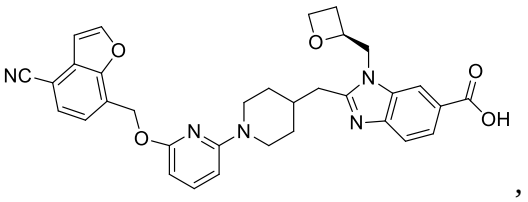
2. A compound or a pharmaceutically acceptable salt, a stereoisomer, a solvate or a hydrate thereof, selected from any of the following compounds:



compound 1



compound 2



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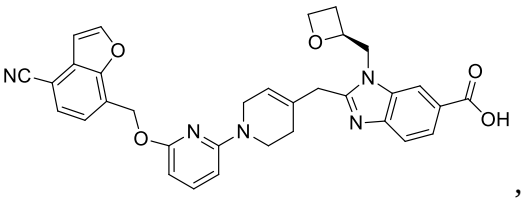
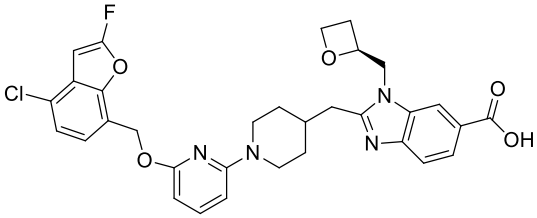
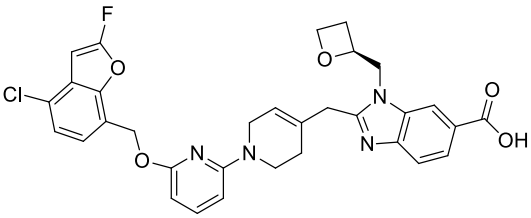


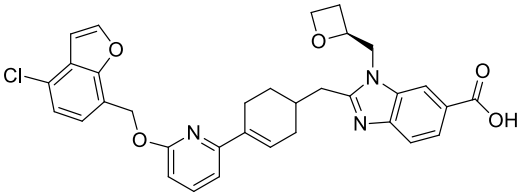
compound 4



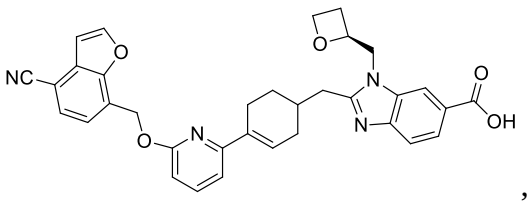
compound 5



compound 6



compound 7



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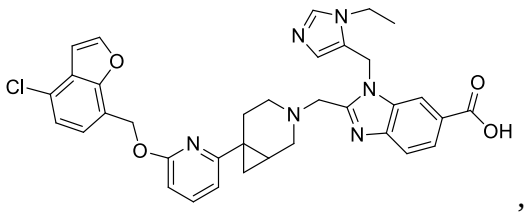

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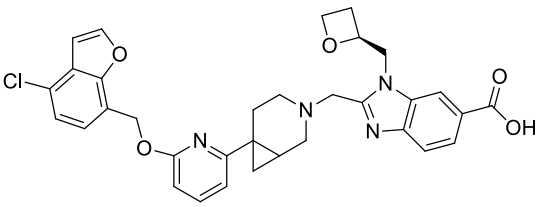

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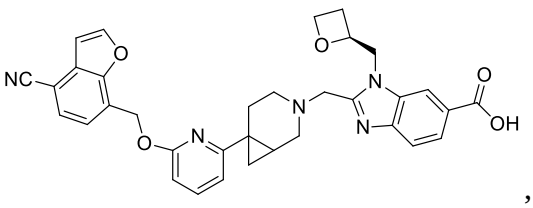

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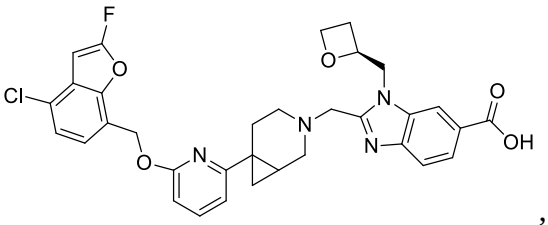

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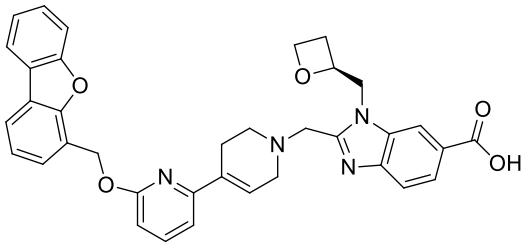

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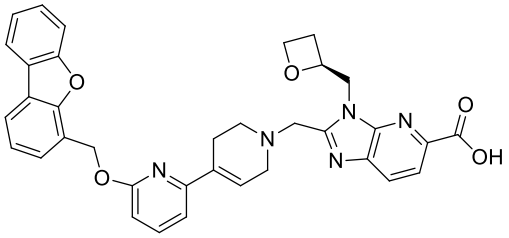

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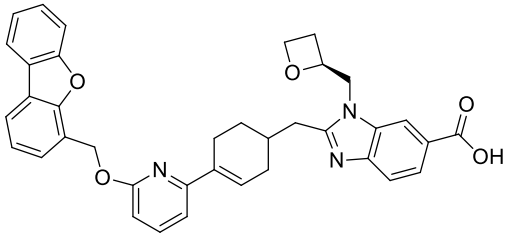

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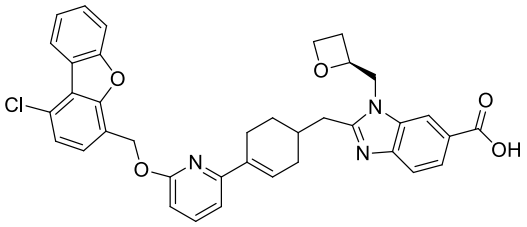

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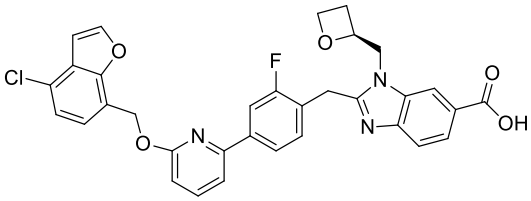

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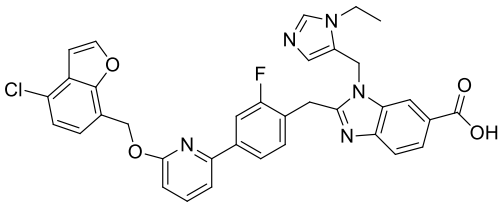

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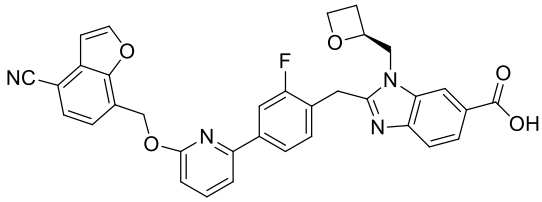

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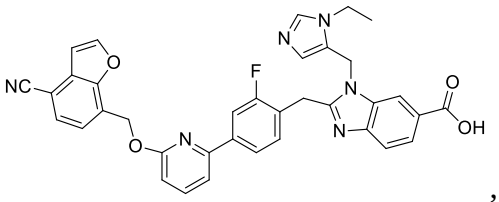

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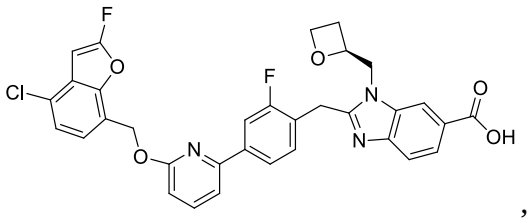

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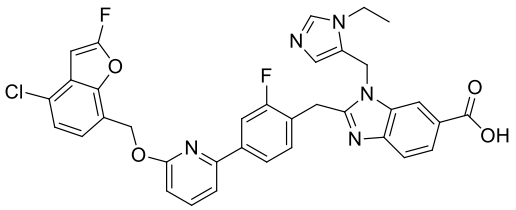

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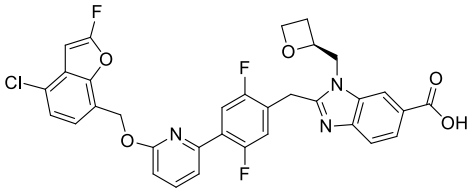

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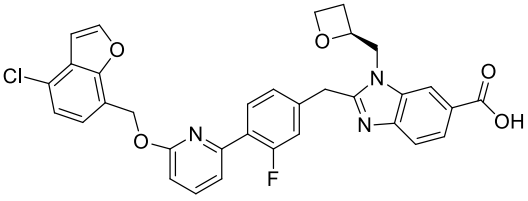

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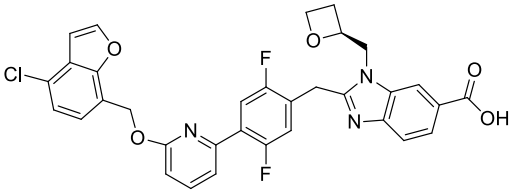

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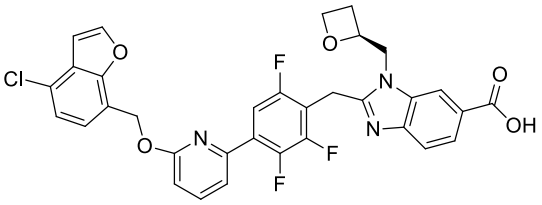

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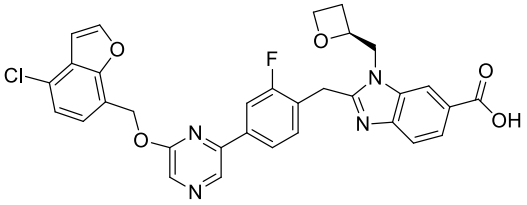

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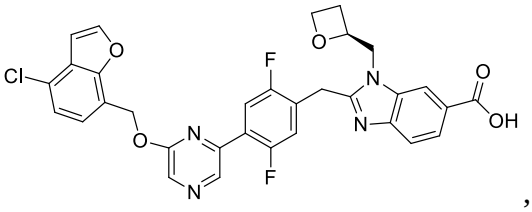

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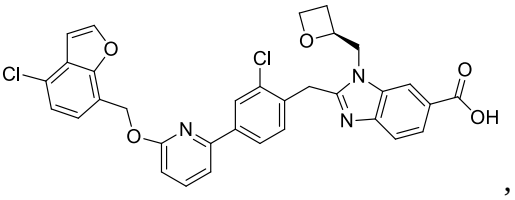

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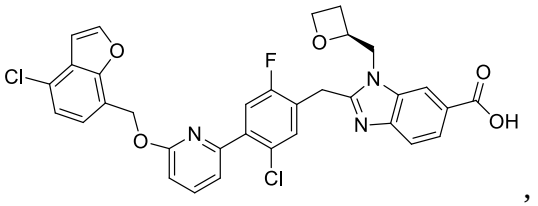

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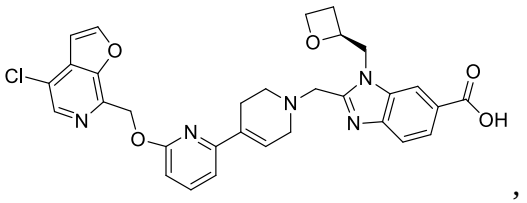

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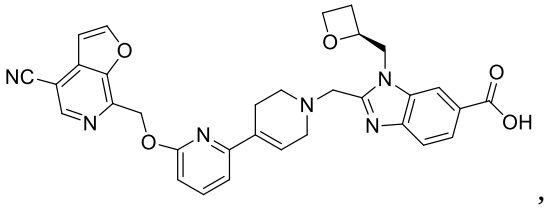

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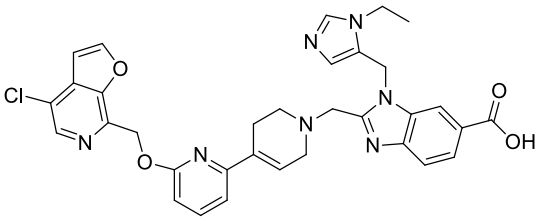

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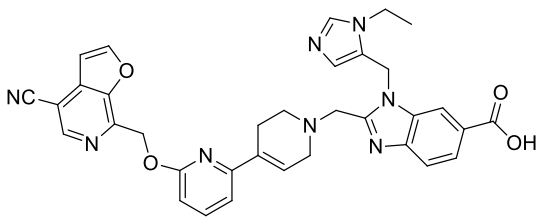

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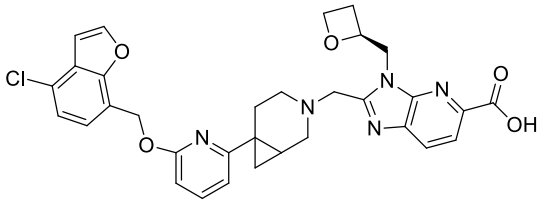

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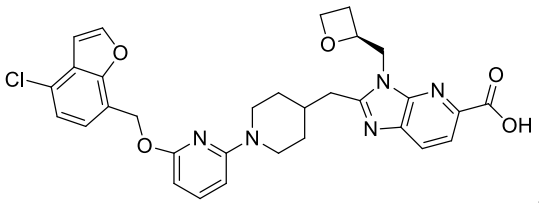

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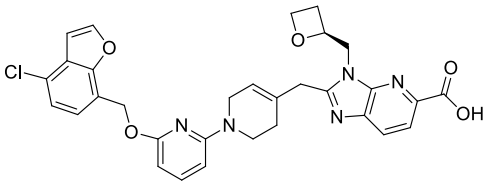

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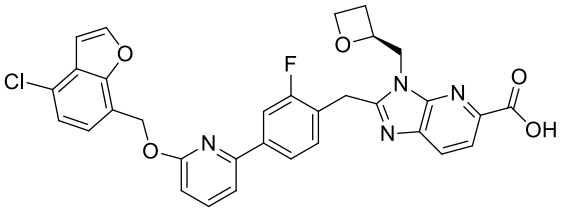

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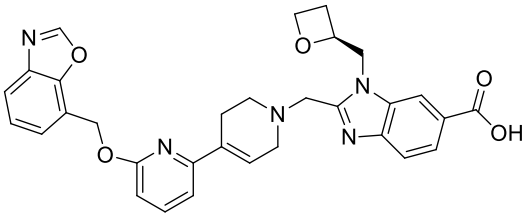

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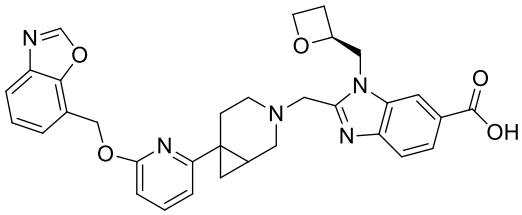

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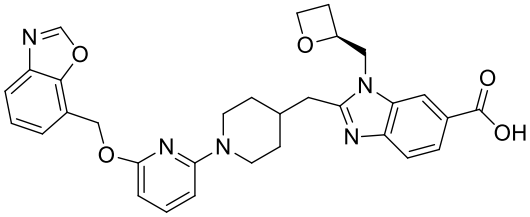

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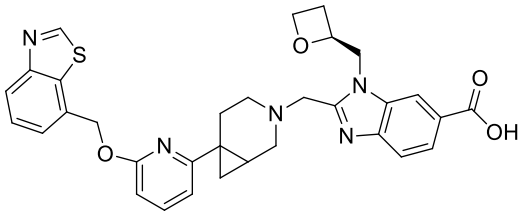

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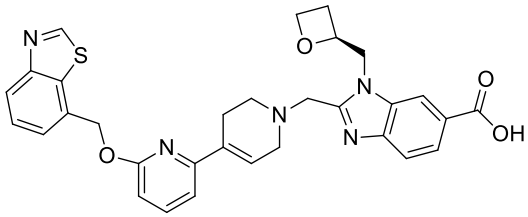

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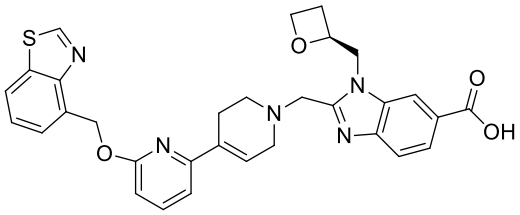

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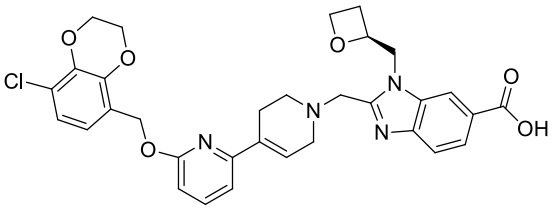
compound 44



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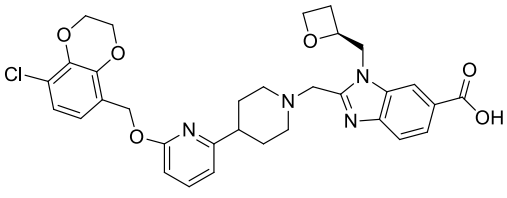
compound 45



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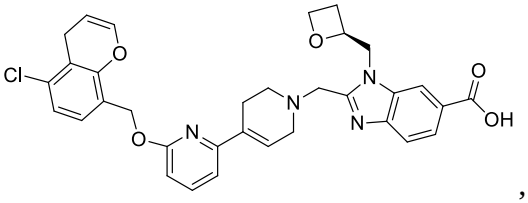
compound 46



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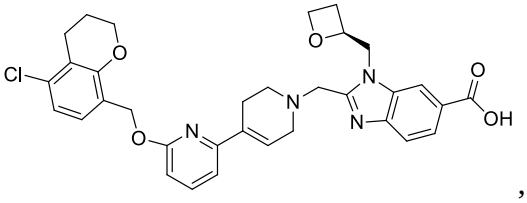
compound 47



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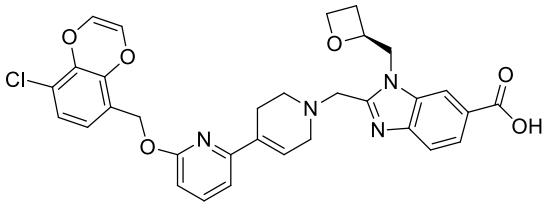
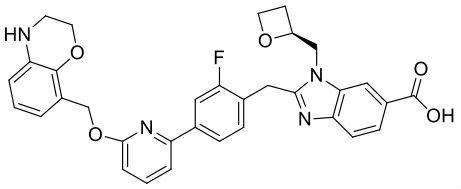
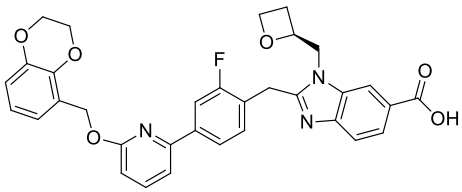
compound 48



compound 49



compound 50



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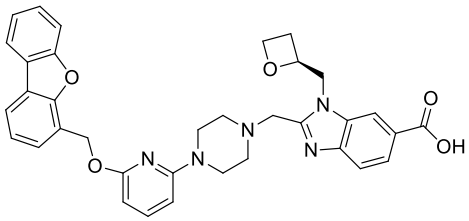

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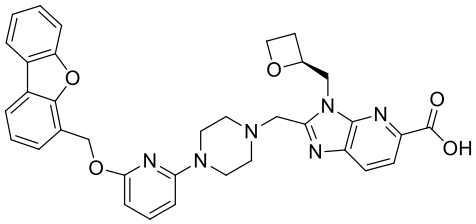

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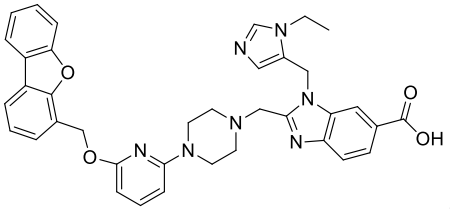

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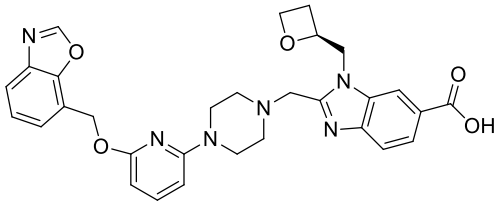

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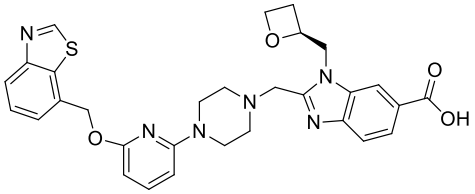

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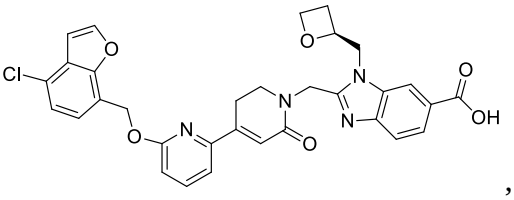

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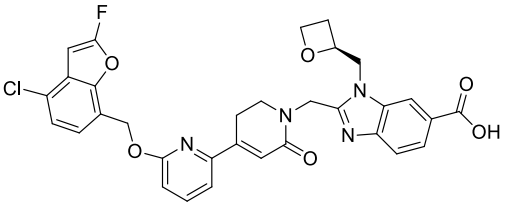

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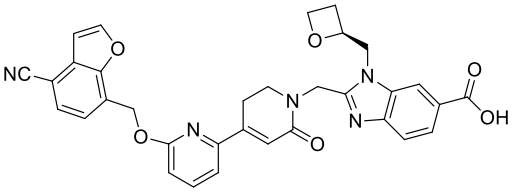

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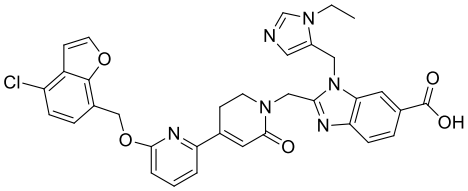

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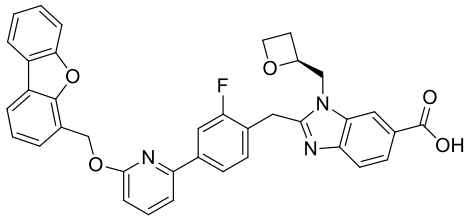

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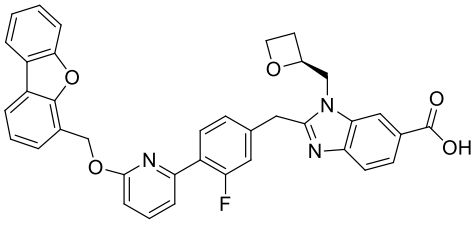

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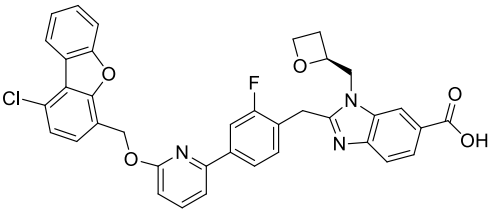
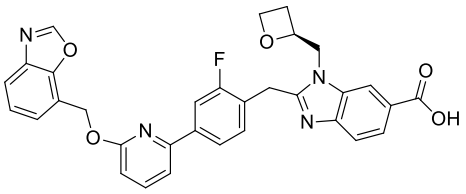
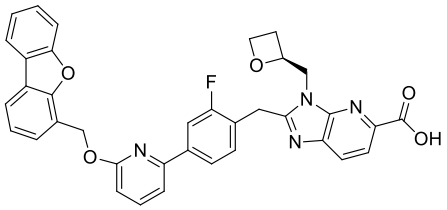


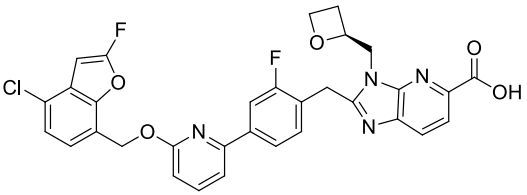
compound 63



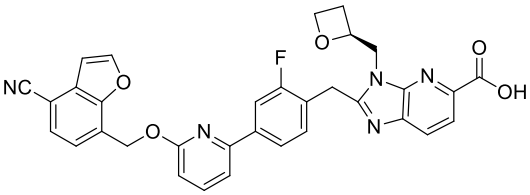
compound 64



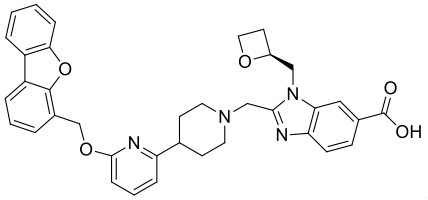
compound 65



compound 66



compound 67



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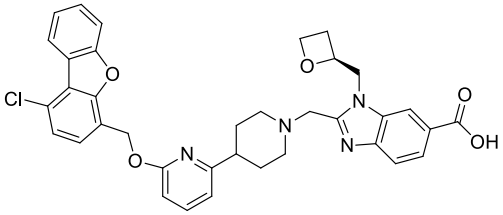
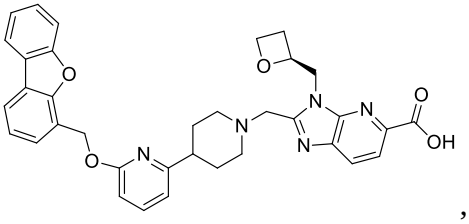
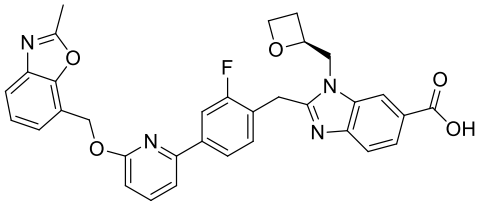


compound 69



compound 70



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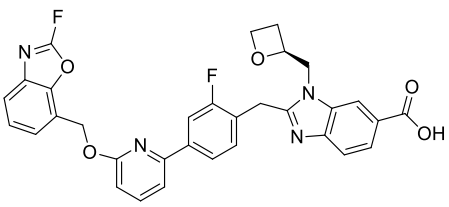
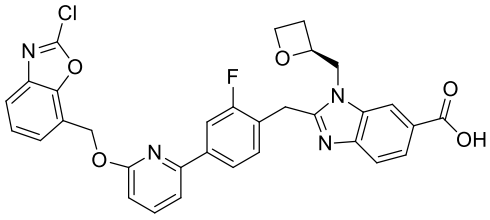
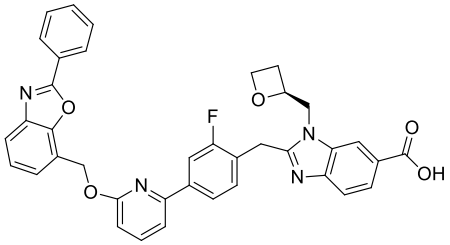


compound 72



compound 73



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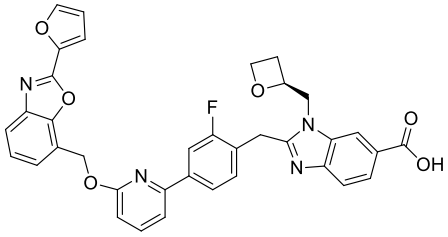
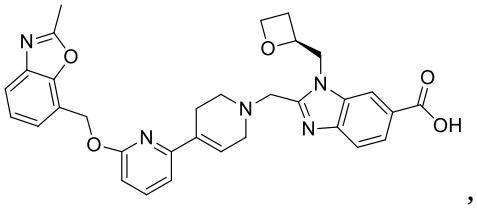
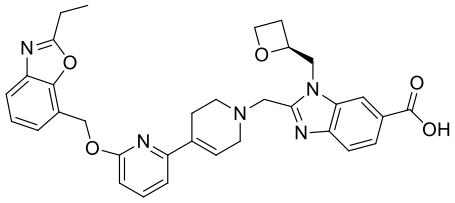


compound 75



compound 76



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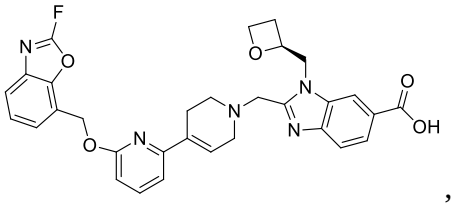

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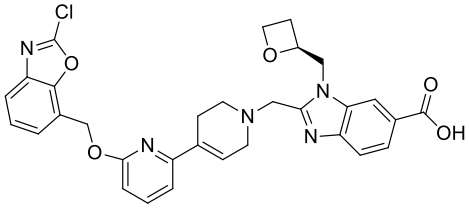

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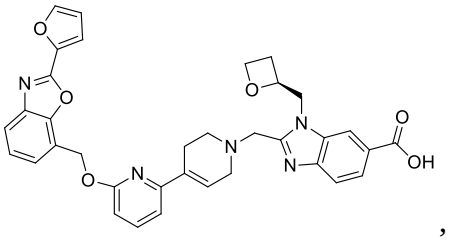

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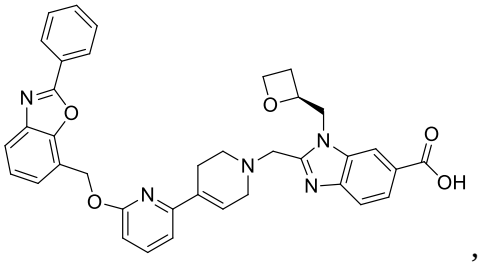

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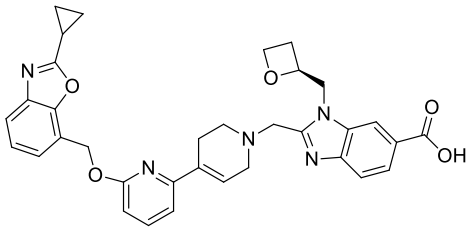
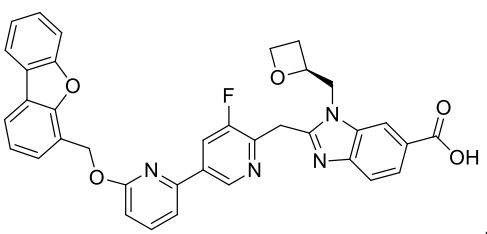
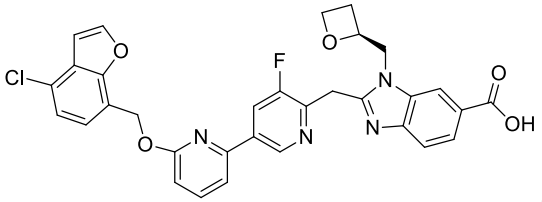


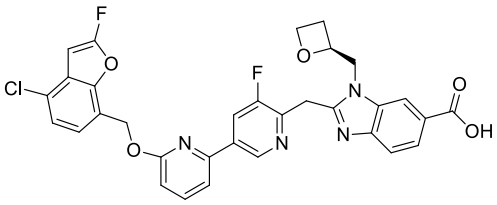
compound 82



compound 83



compound 84



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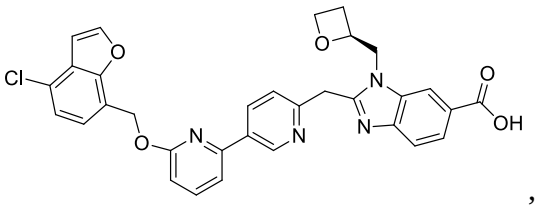

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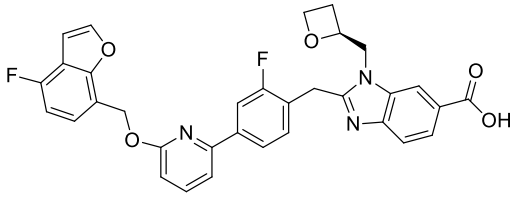
compound 85 compound 86



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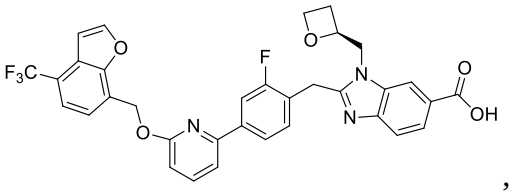

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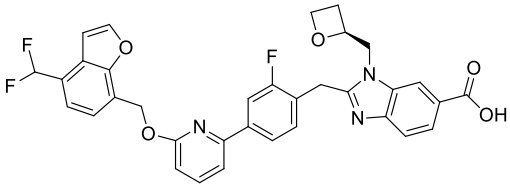
compound 87 compound 88



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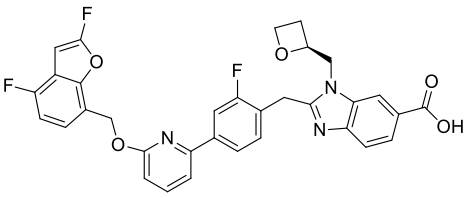

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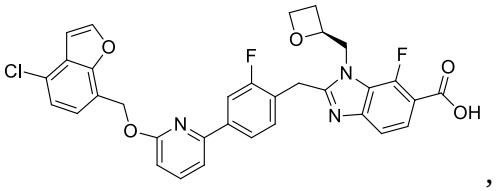
compound 89 compound 90



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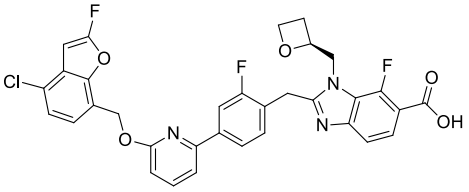

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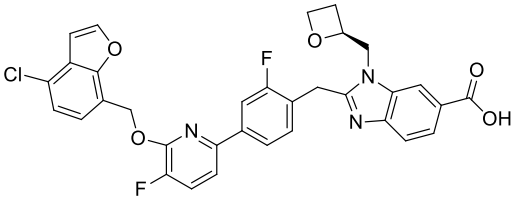
compound 91 compound 92



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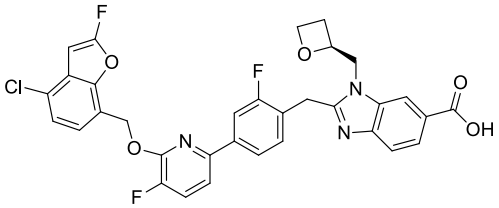

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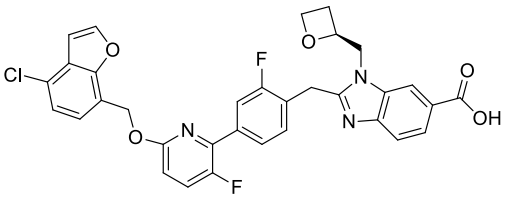
compound 93 compound 94



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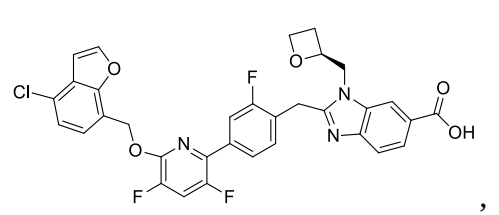

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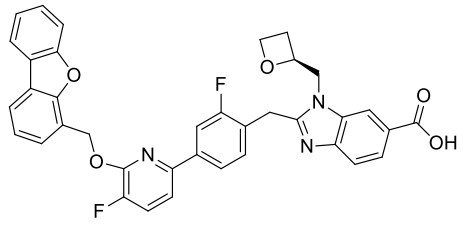
compound 95 compound 96



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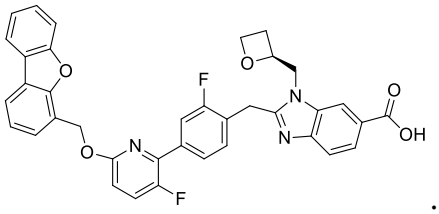

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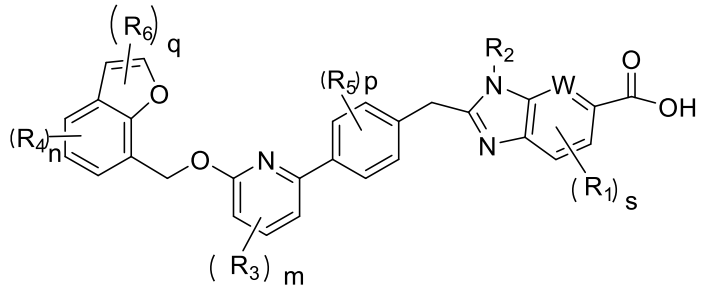
compound 97 compound 98

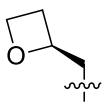
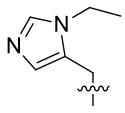
3. A compound of general formula (II-3) or a pharmaceutically acceptable salt, a stereoisomer, a solvate or a hydrate thereof:



formula (II-3)

wherein:

R_1 is selected from hydrogen atom and halogen;

R_2 is independently selected from  or  ;

R_3 is independently selected from hydrogen atom and halogen;

R_4 is independently selected from hydrogen atom, halogen and cyano;

R_5 is independently selected from halogen;

R_6 is independently selected from hydrogen atom, halogen and C1-C6 alkyl;

W is selected from N and CH;

p is selected from 0, 1, 2 or 3;

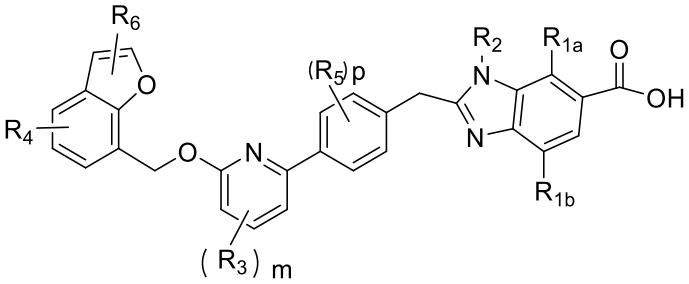
m is selected from 0, 1, 2 or 3;

n is selected from 0, 1, 2 or 3;

q is selected from 0, 1 or 2;

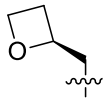
s is selected from 0, 1 or 2;

preferably, the compound or the pharmaceutically acceptable salt, the stereoisomer, the solvate or the hydrate thereof has a structure shown in general formula (II-3-1):



formula (II-3-1)

wherein, R_{1a} and R_{1b} are independently selected from hydrogen atom and F;

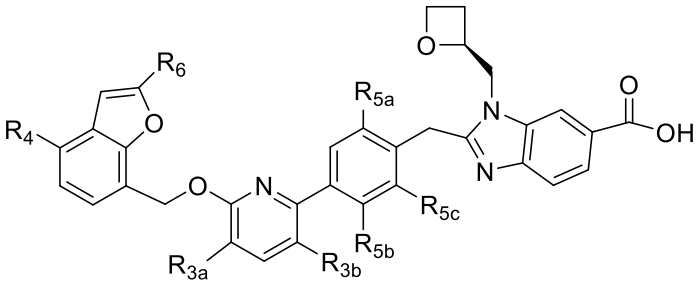
R_2 is  ;

R_6 is independently selected from hydrogen atom and halogen;

m is selected from 1 or 2;

p is selected from 1, 2 or 3;

further preferably, the compound or the pharmaceutically acceptable salt, the stereoisomer, the solvate or the hydrate thereof has a structure shown in general formula (II-3-2):



formula (II-3-2)

wherein, R_{3a} and R_{3b} are independently selected from F and hydrogen atom;

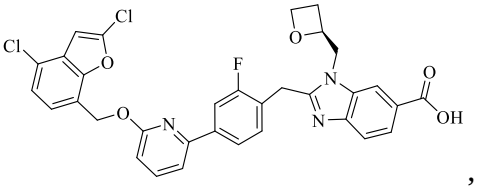
R_4 is independently selected from F, Cl and cyano;

R_{5a}, R_{5b} and R_{5c} are independently selected from hydrogen atom and F;

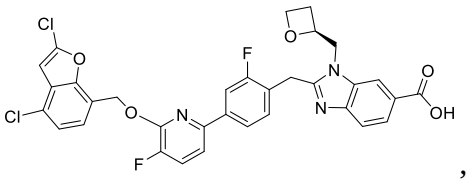
R_6 is independently selected from hydrogen atom, F and Cl; and

further preferably, R_{3a} and R_{3b} are not F at the same time, R_{5a} and R_{5c} are independently selected from hydrogen atom and F, and R_{5b} is hydrogen atom.

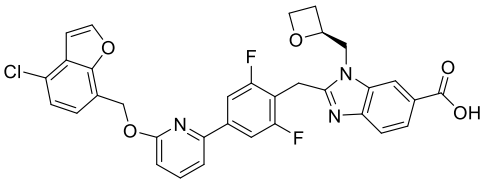
4. A compound or a pharmaceutically acceptable salt, a stereoisomer, a solvate or a hydrate thereof, selected from any of the following compounds:


,

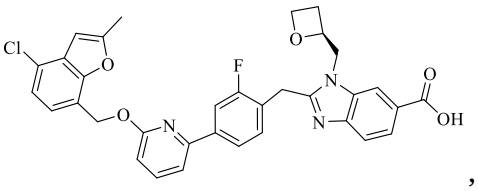
compound 99


,

compound 100


,

compound 101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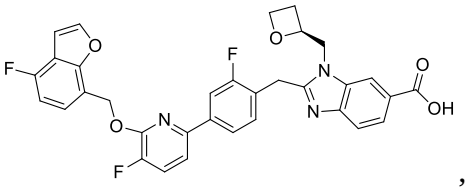
compound 102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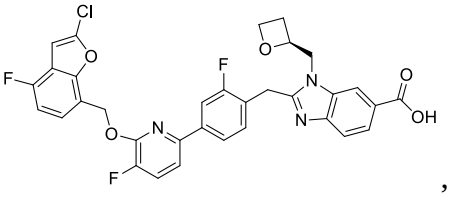
compound 103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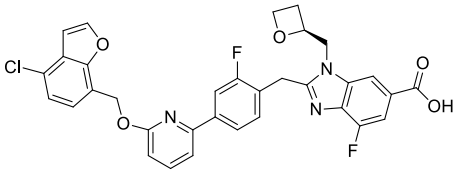
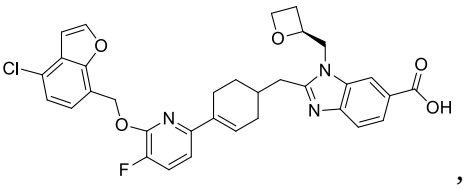
compound 104


,

compound 105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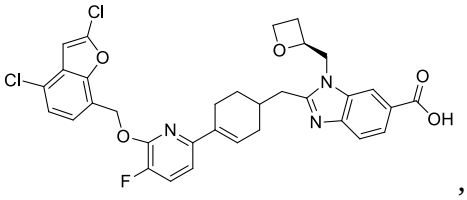
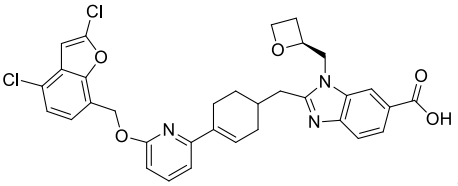
compound 106

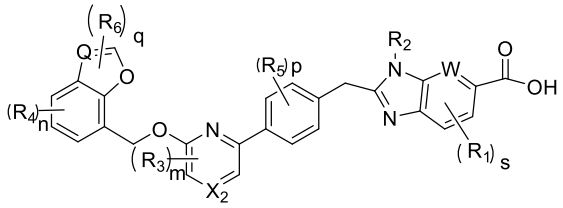

,

compound 107


.

compound 108

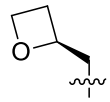
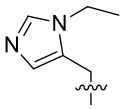
5. A compound of general formula (II') or a pharmaceutically acceptable salt, a stereoisomer, a solvate or a hydrate thereof:



formula (II')

wherein:

R_1 is selected from hydrogen atom and halogen;

R_2 is selected from  or  ;

R_3 is independently selected from hydrogen atom and halogen;

R_4 is independently selected from hydrogen atom, halogen, cyano and C1-C6 alkyl, wherein the C1-C6 alkyl is further substituted by one or more halogens;

R_5 is independently selected from hydrogen atom and halogen;

R_6 is independently selected from hydrogen atom, halogen, C1-C6 alkyl, C3-C6 cycloalkyl, phenyl, furan and C2-C4 alkenyl;

W is selected from N and CR_{10};

X_2 is selected from N and CR_{10};

Q is selected from N and CH;

p is selected from 0, 1, 2 or 3;

m is selected from 0, 1, 2 or 3;

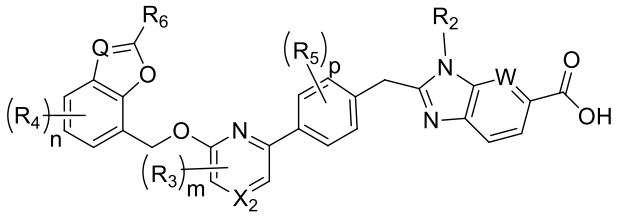
n is selected from 0, 1, 2 or 3;

q is selected from 0, 1 or 2;

s is selected from 0, 1 or 2;

R_{10} is selected from hydrogen atom and halogen;

preferably, the compound or the pharmaceutically acceptable salt, the stereoisomer, the solvate or the hydrate thereof has a structure shown in general formula (II'-1):



formula (II'-1)

wherein:

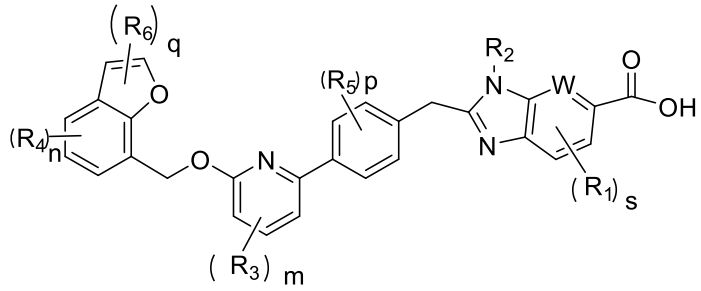
R_3 is selected from hydrogen atom and F;

R_4 is selected from hydrogen atom, F, Cl, cyano, CF_3 and CHF_2;

X_2 and Q are selected from CH; and R_{10} is selected from hydrogen atom and F;

or,

preferably, the compound or the pharmaceutically acceptable salt, the stereoisomer, the solvate or the hydrate thereof has a structure shown in general formula (II'-3):



formula (II'-3)

wherein:

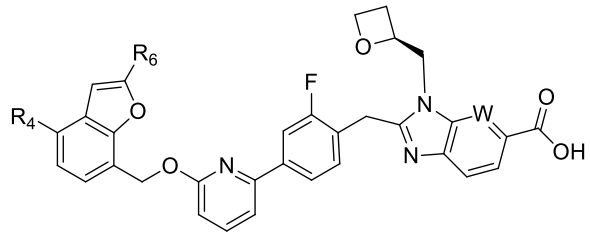
R_4 is independently selected from hydrogen atom, halogen and cyano;

R_6 is independently selected from hydrogen atom, halogen and C1-C6 alkyl; and

W is selected from N and CH.

6. The compound of general formula (II') or the pharmaceutically acceptable salt, the stereoisomer, the solvate or the hydrate thereof according to claim 5, wherein:

the structure shown in general formula (II'-1) is further the structure shown in general formula (II'-1-1):



formula (II'-1-1)

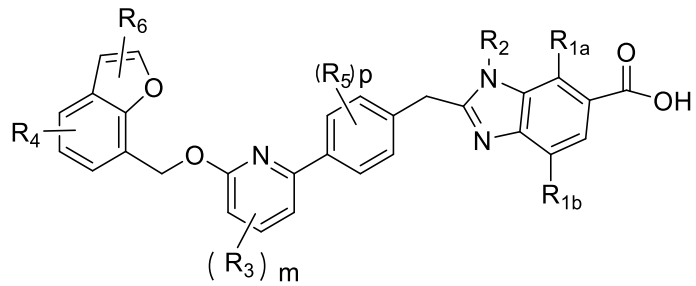
wherein:

R_4 is selected from Cl and cyano;

R_6 is selected from hydrogen atom and F;

R_{10} is selected from hydrogen atom;

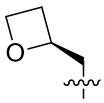
the structure shown in general formula (II'-3) is further the structure shown in general formula (II'-3-1):



formula (II'-3-1)

wherein:

R_{1a} and R_{1b} are independently selected from hydrogen atom and F;

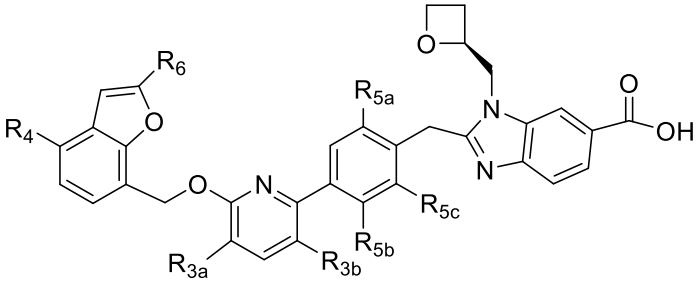
R_2 is:  ;

R_6 is independently selected from hydrogen atom and halogen;

m is selected from 1 or 2;

p is selected from 1, 2 or 3;

preferably, the structure shown in general formula (II'-3) is further the structure shown in general formula (II'-3-2):



formula (II'-3-2)

wherein:

R_{3a} and R_{3b} are independently selected from F and hydrogen atom;

R_4 is independently selected from F, Cl and cyano;

R_{5a}, R_{5b} and R_{5c} are independently selected from hydrogen atom and F;

R_6 is independently selected from hydrogen atom, F and Cl; and

further preferably, R_{3a} and R_{3b} are not F at the same time, R_{5a} and R_{5c} are independently selected from hydrogen atom and F, and R_{5b} is hydrogen atom.

7. A pharmaceutical composition, comprising the compound or the pharmaceutically acceptable salt, the stereoisomer, the solvate or the hydrate thereof according to claim 1 or 2, or claim 3 or 4, or claim 5 or 6, and a pharmaceutically acceptable carrier.

8. Use of the compound or the pharmaceutically acceptable salt, the stereoisomer, the solvate or the hydrate thereof according to claim 1 or 2, or claim 3 or 4, or claim 5 or 6, or the pharmaceutical composition according to claim 7 in preparing a medicament for a GLP-1 receptor agonist.

9. Use of the compound or the pharmaceutically acceptable salt, the stereoisomer, the solvate or the hydrate thereof according to claim 1 or 2, or claim 3 or 4, or claim 5 or 6, or the pharmaceutical composition according to claim 7 in preparing a medicament for treating and/or preventing type I diabetes, type II diabetes, malnutrition-related diabetes, diabetic complications, obesity, metabolic syndrome, hyperglycemia, glucose intolerance, nonalcoholic fatty liver disease (NAFLD), nonalcoholic steatohepatitis (NASH), cardiovascular disease, dyslipidemia, cerebral infarction, stroke, Parkinson's disease, dementia, insulin resistance and hepatic insulin resistance; and preferably use in preparing the medicament for treating and/or preventing type I diabetes, type II diabetes, malnutrition-related diabetes, diabetic complications, obesity, metabolic syndrome, hyperglycemia, glucose intolerance, nonalcoholic fatty liver disease (NAFLD), nonalcoholic steatohepatitis (NASH), cardiovascular disease and dyslipidemia.