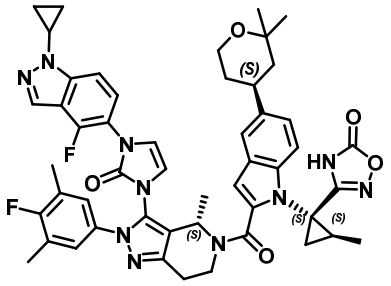
Currently, no small molecule GLP-1 receptor agonists have been approved, and there is a huge clinical demand. Oral small molecule GLP-1 receptor agonists with lower cost and better compliance have the potential to treat a variety of metabolic diseases and thus have broad market prospects.

Summary

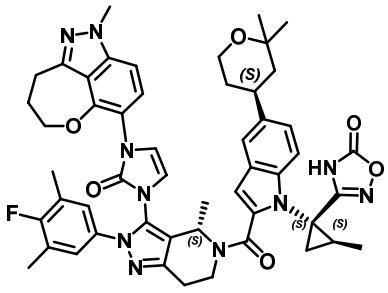
In one aspect, the disclosure is directed to a compound of formula I:



(I)

or a pharmaceutically acceptable salt thereof.

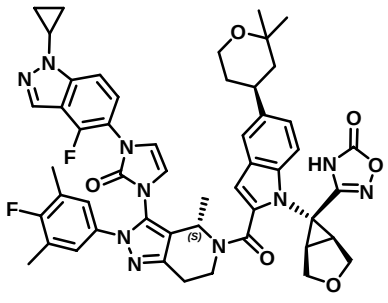
In another aspect, the disclosure is directed to a compound of formula II:



(II)

or a pharmaceutically acceptable salt thereof.

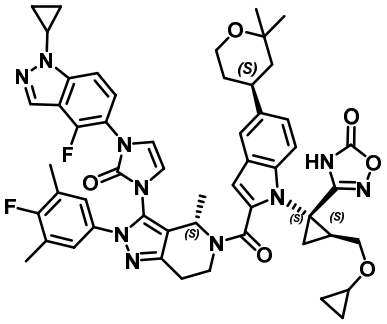
In another aspect, the disclosure is directed to a compound of formula III:



(III)

or a pharmaceutically acceptable salt thereof.

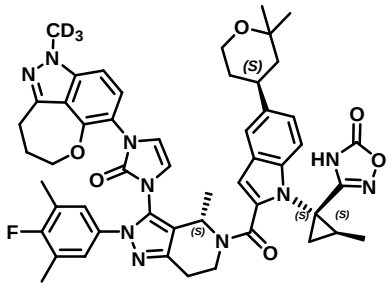
In another aspect, the disclosure is directed to a compound of formula IV:



(IV)

or a pharmaceutically acceptable salt thereof.

In another aspect, the disclosure is directed to a compound of formula V:



(V)

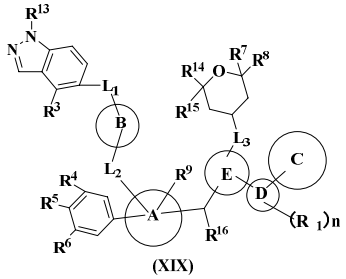
or a pharmaceutically acceptable salt thereof.

In another aspect, the disclosure is directed to a pharmaceutical composition comprising (i) a pharmaceutically acceptable carrier and (ii) the compound as defined herein.

In another aspect, the disclosure is directed to use of the compound as defined herein, or a pharmaceutically acceptable salt thereof, in the preparation of a medicament for the treatment of a metabolic-related disease.

In another aspect, the disclosure is directed to a compound as defined herein, or a pharmaceutically acceptable salt thereof, for use in therapy.

An object of the present invention is to provide a compound represented by general formula (XIX), a prodrug thereof, a stereoisomer thereof, or a pharmaceutically acceptable salt thereof:



(XIX)

wherein,

R^{13} is selected from hydrogen, deuterium, halogen, amino, nitro, hydroxyl, cyano, oxo, thio, C_{1-6} alkyl, C_{1-6} deuterated alkyl, C_{1-6} haloalkyl, C_{1-6} deuterated haloalkyl, C_{1-6} hydroxyalkyl, C_{1-6} deuterated hydroxyalkyl, C_{1-6} sulfanyl, C_{1-6} deuterated sulfanyl, C_{1-6} alkoxy, C_{1-6} deuterated alkoxy, C_{1-6} haloalkoxy, C_{1-6} deuterated haloalkoxy, C_{2-6} alkenyl, C_{2-6} alkynyl, C_{3-8} cycloalkyl, 3-8 membered heterocyclic, C_{6-10} aryl or 5-10 membered heteroaryl, the amino, C_{1-6} alkyl, C_{1-6} deuterated alkyl, C_{1-6} haloalkyl, C_{1-6} deuterated haloalkyl, C_{1-6} hydroxyalkyl, C_{1-6} deuterated hydroxyalkyl, C_{1-6} sulfanyl, C_{1-6} deuterated sulfanyl, C_{1-6} alkoxy, C_{1-6} deuterated alkoxy, C_{1-6} haloalkoxy, C_{1-6} deuterated haloalkoxy, C_{2-6} alkenyl, C_{2-6} alkynyl, C_{3-8} cycloalkyl, 3-8 membered heterocyclic, C_{6-10} aryl or 5-10 membered heteroaryl, which are optionally further substituted by one or more substituents selected from deuterium, halogen, amino, nitro, hydroxyl, cyano, oxo, thio, C_{1-6} alkyl, C_{1-6} deuterated alkyl, C_{1-6} haloalkyl, C_{1-6} deuterated haloalkyl, C_{1-6} hydroxyalkyl, C_{1-6} deuterated hydroxyalkyl, C_{1-6} sulfanyl, C_{1-6} deuterated sulfanyl, C_{1-6} alkoxy, C_{1-6} deuterated alkoxy, C_{1-6} haloalkoxy, C_{1-6} deuterated haloalkoxy, C_{2-6} alkenyl, C_{2-6} alkynyl, C_{3-8} cycloalkyl, 3-8 membered heterocyclyl, C_{6-10} aryl or 5-10 membered heteroaryl;

L_1, L_2 or L_3 are each independently selected from a bond, C_{2-4} alkenylene, C_{2-4} alkynylene or $-(CH_2)_{n1}-$;