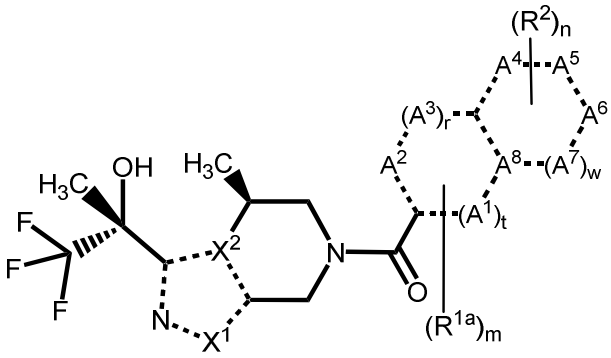
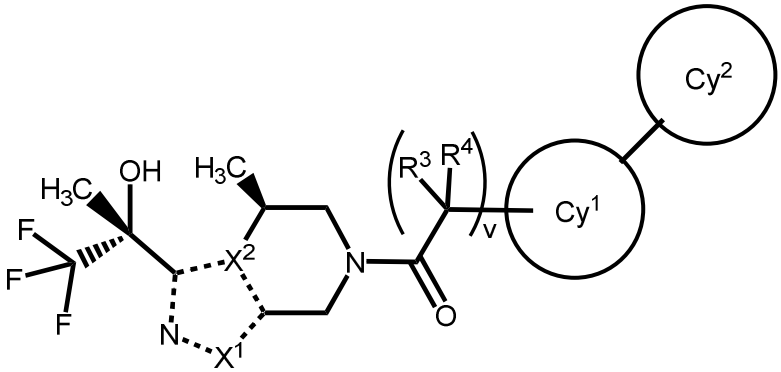
CLAIMS

1. A compound of the formula [I-a] or the formula [II], or a pharmaceutically acceptable salt thereof:



[I-a]



[II]

wherein

a bond in a dotted line is a single bond or a double bond,

X^1 is a carbon atom, a nitrogen atom or an oxygen atom,

X^2 is a carbon atom or a nitrogen atom,

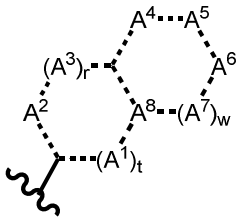
R^{1a} is C_{1-4} alkyl or C_{1-4} alkylcarbonyl,

R^2 is halogen, cyano or C_{1-4} alkyl,

m is 0 or 1,

n is 0, 1 or 2, when n is 2, each R^2 is the same or different,

A^1, A^2, A^3, A^4, A^5, A^6 and A^7 are each independently selected from a carbon atom, a nitrogen atom and an oxygen atom, A^8 is selected from a carbon atom and a nitrogen atom, and a total number of the nitrogen atom and the oxygen atom contained in a partial structural formula:



is 0, 1, 2 or 3,

t is 0 or 1,

r is 0, 1 or 2, and a total of t and r is 1 or 2,

w is 0 or 1,

R^3 and R^4 are each independently hydrogen or C_{1-4} alkyl,

Cy^1 is

(1) (i) C_{4-6} cycloalkyl or (ii) 4- to 6-membered saturated or partially saturated heterocyclyl having one nitrogen atom, the C_{4-6} cycloalkyl and the saturated or partially saturated heterocyclyl is optionally substituted by one substituent independently selected from the group consisting of C_{1-4} alkyl and oxo, or

(2) (i) phenyl or (ii) 5- or 6-membered heteroaryl having 1, 2 or 3 hetero atoms independently selected from the group consisting of a nitrogen atom and an oxygen atom, the phenyl and the heteroaryl are optionally substituted by 1 or 2 substituents independently selected from the group consisting of halogen, cyano, carboxy, C_{1-4} alkyl, haloC_{1-4} alkyl and C_{3-6} cycloalkyl,

Cy^2 is

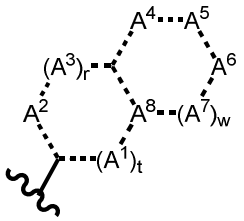
(1) (i) C_{3-6} cycloalkyl or (ii) 4- to 6-membered saturated heterocyclyl having 1 or 2 hetero atoms independently selected from the group consisting of a nitrogen atom and an oxygen atom, and the C_{3-6} cycloalkyl and the saturated heterocyclyl are optionally substituted by 1 or 2 substituents independently selected from the group consisting of halogen, hydroxy and C_{1-4} alkyl, or

(2) (i) phenyl or (ii) 5- or 6-membered heteroaryl having 1, 2, 3 or 4 nitrogen atoms, and the phenyl and the heteroaryl are optionally substituted by 1 or 2 substituents independently

selected from the group consisting of halogen, cyano, C_{1-4} alkyl, C_{1-4} alkoxy and C_{1-4} alkylsulfonyl, and
v is 0 or 1.

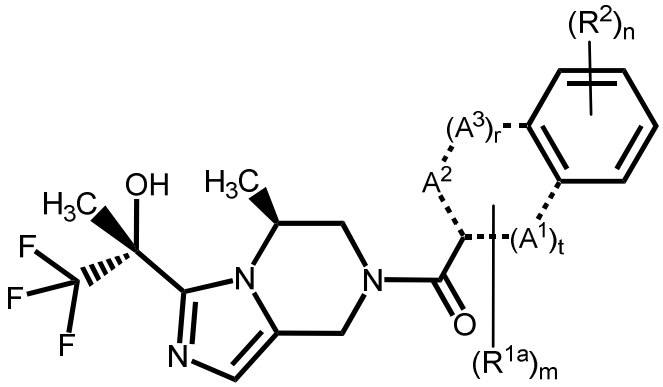
2. The compound according to claim 1 wherein X^1 is a carbon atom, and X^2 is a nitrogen atom, or a pharmaceutically acceptable salt thereof.

3. The compound according to claim 1 or 2 wherein, in the formula [I-a], the total number of the nitrogen atom and the oxygen atom contained in the partial structural formula:



wherein each symbol is as defined in claim 1, is 2, or a pharmaceutically acceptable salt thereof.

4. The compound according to any one of claims 1 to 3, which is a compound of the formula [I-b]:



[I-b]

wherein each symbol is as defined in claim 1, or a pharmaceutically acceptable salt thereof.

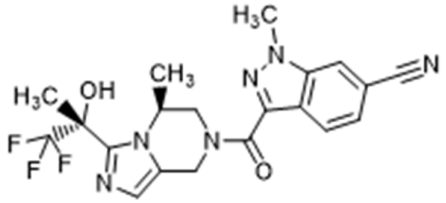
5. The compound according to claim 1 wherein v is 0, or a

pharmaceutically acceptable salt thereof.

6. The compound according to claim 1 or 5 wherein Cy^1 is 5- or 6-membered heteroaryl having 1, 2 or 3 hetero atoms independently selected from the group consisting of a nitrogen atom and an oxygen atom, and the heteroaryl is optionally substituted by 1 or 2 substituents independently selected from the group consisting of halogen, cyano, C_{1-4} alkyl, haloC_{1-4} alkyl and C_{3-6} cycloalkyl, or a pharmaceutically acceptable salt thereof.

7. The compound according to any one of claims 1, 5 and 6 wherein Cy^2 is
(1) C_{3-6} cycloalkyl optionally substituted by 1 or 2 substituents independently selected from the group consisting of halogen, hydroxy and C_{1-4} alkyl, or
(2) phenyl optionally substituted by 1 or 2 substituents independently selected from the group consisting of halogen, cyano, C_{1-4} alkyl, C_{1-4} alkoxy and C_{1-4} alkylsulfonyl, or a pharmaceutically acceptable salt thereof.

8. A compound represented by formula:



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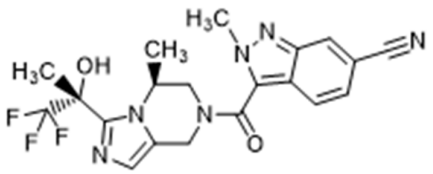
or a pharmaceutically acceptable salt thereof.

9. A compound represented by formula:



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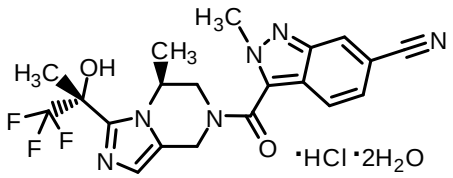
or a pharmaceutically acceptable salt thereof.

10. A compound represented by formula:



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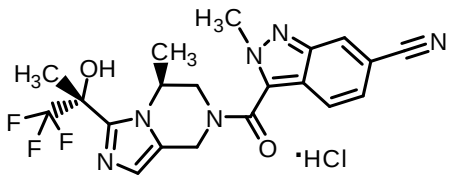
11. A compound represented by formula:



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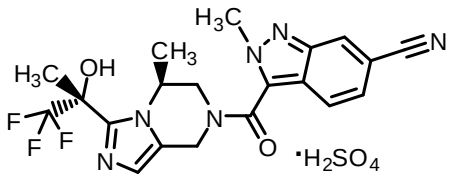
12. A compound represented by formula:



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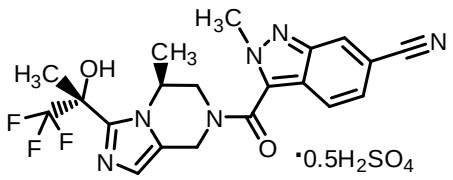
13. A compound represented by formula:



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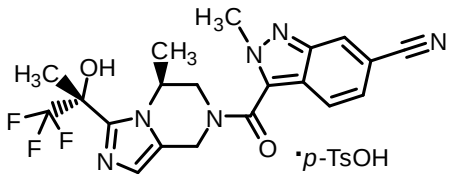
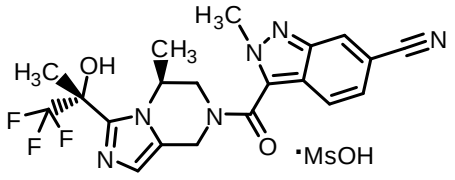
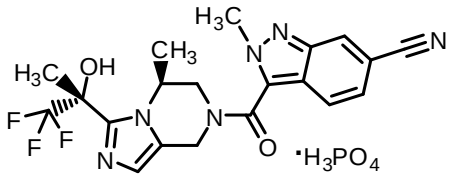
14. A compound represented by formula:



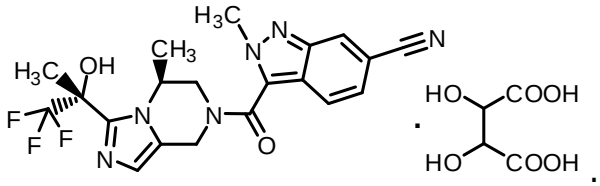
15. A compound represented by formula:



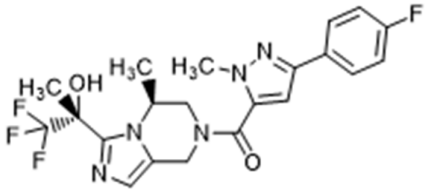
16. A compound represented by formula:



17. A compound represented by formula:

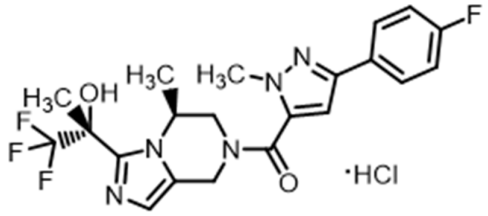


18. A compound represented by formula:



or a pharmaceutically acceptable salt thereof.

19. A compound represented by formula:



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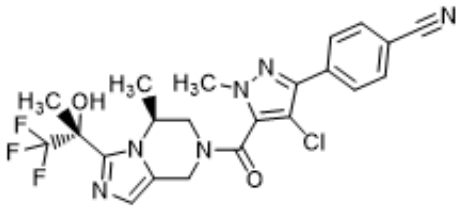
20. A compound represented by formula:



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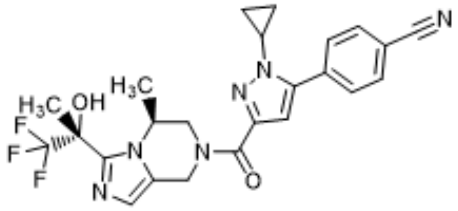
or a pharmaceutically acceptable salt thereof.

21. A compound represented by formula:



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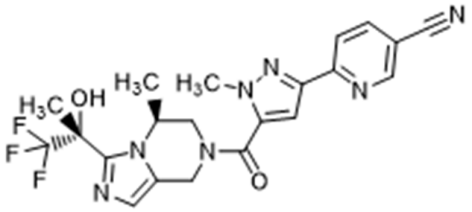
or a pharmaceutically acceptable salt thereof.

22. A compound represented by formula:



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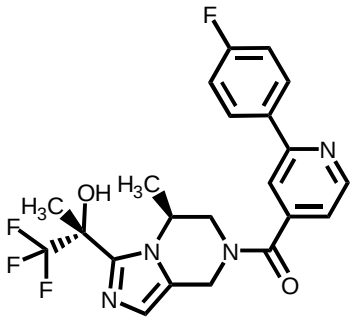
or a pharmaceutically acceptable salt thereof.

23. A compound represented by formula:



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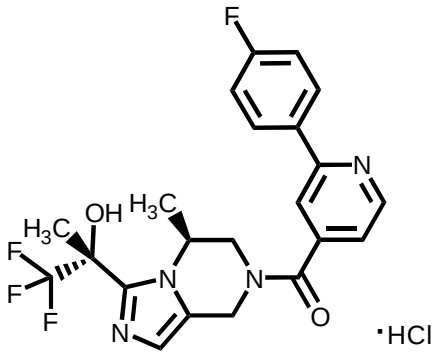
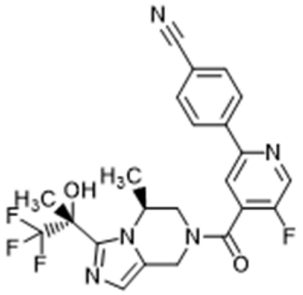
or a pharmaceutically acceptable salt thereof.

24. A compound represented by formula:



·HCl.

25. A compound represented by formula:



,

or a pharmaceutically acceptable salt thereof.

26. A pharmaceutical composition comprising the compound according to any one of claims 1 to 25, or a pharmaceutically acceptable salt thereof, and a pharmaceutically acceptable carrier.

27. An agent for the treatment or prophylaxis of diabetes, insulin resistance syndrome, metabolic syndrome, hyperglycemia, hyperlactacidemia, diabetic complication, cardiac failure, cardiomyopathy, myocardial ischemia, myocardial infarction, angina pectoris, dyslipidemia, atherosclerosis, peripheral arterial disease, intermittent claudication, chronic obstructive pulmonary disease, brain ischemia, cerebral apoplexy, mitochondrial disease, mitochondrial encephalomyopathy, cancer or pulmonary hypertension, the agent comprises the compound according to any one of claims 1 to 25, or a pharmaceutically acceptable salt thereof.

28. The agent according to claim 27 wherein diabetes is type 1 diabetes or type 2 diabetes.

29. The agent according to claim 27 wherein diabetic complication is selected from the group consisting of diabetic neuropathy, diabetic retinopathy, diabetic nephropathy and cataract.

30. The agent according to claim 27 wherein cardiac failure is acute cardiac failure or chronic cardiac failure.

31. The agent according to claim 27 wherein pulmonary hypertension is pulmonary arterial hypertension.

32. Use of the compound according to any one of claims 1 to 25 or a pharmaceutically acceptable salt thereof in the production of an agent for the treatment or prophylaxis of a disease selected from the group consisting of diabetes, insulin resistance syndrome, metabolic syndrome, hyperglycemia, hyperlactacidemia, diabetic complication, cardiac failure, cardiomyopathy, myocardial ischemia, myocardial infarction, angina pectoris, dyslipidemia, atherosclerosis, peripheral

arterial disease, intermittent claudication, chronic obstructive pulmonary diseases, brain ischemia, cerebral apoplexy, mitochondrial disease, mitochondrial encephalomyopathy, cancer and pulmonary hypertension.

33. The use according to claim 32 wherein diabetes is type 1 diabetes or type 2 diabetes.

34. The use according to claim 32 wherein diabetic complication is selected from the group consisting of diabetic neuropathy, diabetic retinopathy, diabetic nephropathy and cataract.

35. The use according to claim 32 wherein cardiac failure is acute cardiac failure or chronic cardiac failure.

36. The use according to claim 32 wherein pulmonary hypertension is pulmonary arterial hypertension.

37. The compound according to any one of claims 1 to 25 or a pharmaceutically acceptable salt thereof for use in the treatment or prophylaxis of a disease selected from the group consisting of diabetes, insulin resistance syndrome, metabolic syndrome, hyperglycemia, hyperlactacidemia, diabetic complication, cardiac failure, cardiomyopathy, myocardial ischemia, myocardial infarction, angina pectoris, dyslipidemia, atherosclerosis, peripheral arterial disease, intermittent claudication, chronic obstructive pulmonary diseases, brain ischemia, cerebral apoplexy, mitochondrial disease, mitochondrial encephalomyopathy, cancer and pulmonary hypertension.

38. The compound or a pharmaceutically acceptable salt thereof for use according to claim 37 wherein diabetes is type 1 diabetes or type 2 diabetes.

39. The compound or a pharmaceutically acceptable salt thereof for use according to claim 37 wherein diabetic complication is selected from the group consisting of diabetic neuropathy, diabetic retinopathy, diabetic nephropathy and cataract.

40. The compound or a pharmaceutically acceptable salt thereof for use according to claim 37 wherein cardiac failure is acute cardiac failure or chronic cardiac failure.

41. The compound or a pharmaceutically acceptable salt thereof for use according to claim 37 wherein pulmonary hypertension is pulmonary arterial hypertension.