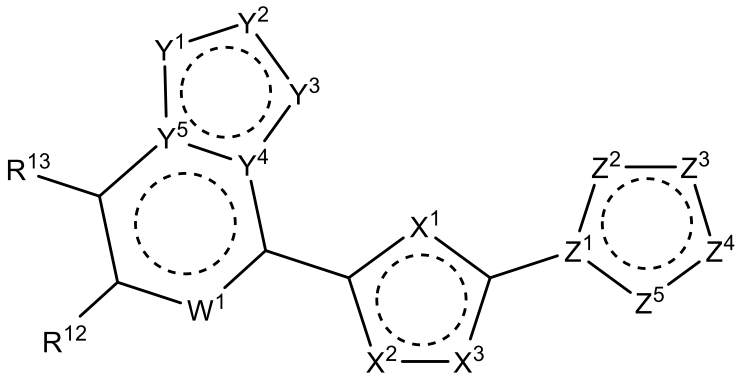
We Claim:

1. A compound of formula (I):



(I) ,

or a pharmaceutically acceptable salt thereof, wherein

each  in a ring independently represents two conjugated double bonds in a five-membered heteroaromatic ring and three conjugated double bonds in a six-membered aromatic or heteroaromatic ring;

W^1 is selected from CR^{11} and N;

X^1 is selected from CR^1, N, NR^1, O and S;

X^2 is selected from CR^2, N, NR^2, O and S;

X^3 is selected from CR^3, N, NR^3, O and S;

where two or three of X^1, X^2 and X^3 are independently selected from N, NR^1, NR^2, NR^3, O and S; and

where at least one of X^1, X^2 and X^3 is selected from N, NR^1, NR^2 and NR^3;

Y^1 is selected from N, NR^4, O, S and CR^4;

Y^2 is selected from N, NR^5, O, S and CR^5;

Y^3 is selected from N, NR^6, O, S and CR^6;

Y^4 is selected from C and N;

Y^5 is selected from C and N;

where at least one and not more than two of Y^1, Y^2 and Y^3 are independently selected from N, NR^4, NR^5 and NR^6;

where when if one of Y^4 or Y^5 is N, the other one of Y^4 or Y^5 is C;

Z^1 is selected from C and N;

Z^2 is selected from N, NR^8 and CR^8;

Z^3 is selected from N, NR^9 and CR^9;

Z^4 is selected from N, NR^{10} and CR^{10};

Z^5 is selected from N, NR^7 and CR^7;

where two or three of Z^1, Z^2, Z^3, Z^4 and Z^5 are independently selected from N, NR^7, NR^8, NR^9, and NR^{10};

each R^1 is independently selected from the group consisting of H, C_1-C_8 alkyl, C_1-C_8 alkylene-NRR and C_1-C_8 alkylene-C(O)OR;

each R^2 is independently selected from the group consisting of H, C_1-C_8 alkyl, C_1-C_8 alkylene-NRR, C_1-C_8 alkylene-C(O)OR, C_1-C_8 alkylene-OR and C_1-C_8 alkylene-O-$P(O)(OH)_2$;

each R^3 is independently selected from the group consisting of H, C_1-C_8 alkyl, C_1-C_8 alkylene-NRR, C_1-C_8 alkylene-C(O)OR and C_1-C_8 alkylene-O-$P(O)(OH)_2$;

each R^4 is independently selected from the group consisting of H, -OR, -NRR, C_1-C_8 alkyl optionally substituted with one or two -OR, C_1-C_8 alkylene-NRR, -C(O)OR, C_1-C_8 alkylene-C(O)OR, 3-10 membered heterocycle, C_1-C_8 alkylene-3-10 membered heterocycle optionally substituted with one 3-10 membered heterocycle, (C_3-C_{10})- cycloalkyl, and C_1-C_8 alkylene-(C_3-C_{10})- cycloalkyl;

each R^5 is independently selected from the group consisting of H, -OR, C_1-C_8 alkyl, -NRR, C_1-C_8 alkylene-NRR, -C(O)OR, C_1-C_8 alkylene-C(O)OR, 3-10 membered heterocycle, C_1-C_8 alkylene-3-10 membered heterocycle optionally substituted with one 3-10 membered heterocycle, and C_1-C_8 alkylene-OR;

each R^6 is H;

R^7 is selected from the group consisting of H, halo, hydroxy and NH_2;

R^8 is selected from the group consisting of H, C_1-C_8 alkyl optionally substituted with one or two -NRR or -OR, C_1-C_8 alkylene-C(O)OR and C_1-C_8 alkylene-SO_2R;

R^9 is H;

R^{10} is selected from the group consisting of H, C_1-C_8 alkyl optionally substituted with one or two -OR, and halo;

R^{11} is selected from the group consisting of H, C_1-C_8 alkyl, -OR and halo;

R^{12} is -C(O)N(R)$_2$;

R^{13} is H;

each R is independently selected from the group consisting of H, C_1-C_8 alkyl, and C_1-C_8 haloalkyl, or two R join to form, together with the atom or atoms to which they are bound, a -(C_3-C_{10}) cycloalkyl or 3-10 membered heterocycle, where said 3-10 membered heterocycle contains one, two or three atoms each independently selected from N, O and S; and

where, when two R join to form, together with the atom or atoms to which they are bound, a -(C_3-C_{10}) cycloalkyl or 3-10 membered heterocycle, said -(C_3-C_{10}) cycloalkyl or 3-10 membered heterocycle is optionally substituted with one or more substituents each independently selected from C_1-C_8 alkyl, hydroxy, C_1-C_8 alkoxy, -(C_3-C_{10}) cycloalkyl, 3-10 membered heterocycle, halo and cyano.

2. A compound, or a pharmacautically acceptable salt thereof, according to claim 1, wherein each R^1 is independently H.

3. A compound, or a pharmaceutcially acceptable salt thereof, according to any one of claims 1 or 2, wherein each R^2 is independently selected from the group consisting of H, CH_3, CH_2NH_2, $CH(NH_2)CH_3$ and $CH_2NH(CH_3)$.

4. A compound, or a pharmaceutically acceptable salt thereof, according to any one of claims 1 to 3, wherein each R^3 is independently selected from the group consisting of H and $CH_2OPO(OH)_2$.

5. A compound, or a pharmaceutically acceptable salt thereof, according to any one of claims 1 to 4, wherein each R^4 is independently selected from the group consisting of CH_3,

CH_2CH_3, $(CH_2)_3OH$, $CH_2CH(CH_2OH)_2$, $(CH_2)_2N(CH_3)CH_2CF_3$, $(CH_2)_2$-(N-morpholinyl), $(CH_2)_3$-(N-morpholinyl), $CH(CH_3)CH_2$-(N-morpholinyl), $(CH_2)_2$-(N-2,6-dimethyl morpholinyl), $(CH_2)_2$-(N-2, 5-dimethyl-morpholinyl), $(CH_2)_2$-(N-8-oxa-3-azabicyclo[3.2.1]octan-3-yl), $(CH_2)_2$-(N-4-cyano piperidinyl), $(CH_2)_2$-(N-4,4-difluoro-piperidinyl), $(CH_2)_2$-(N-2-fluoro azetidinyl), CH_2-(2-azetidinyl-N-tetrahydropyranyl) and $CH_2C(O)OH$.

6. A compound, or a pharmaceutically acceptable salt thereof, according to any one of claims 1 to 5, wherein each R^5 is independently selected from the group consisting of H, CH_3, CH_2CH_3, $(CH_2)_2N(CH_3)(CH_2CF_3)$, $(CH_2)_2$-(N-morpholinyl), $(CH_2)_3$-(N-morpholinyl), $(CH_2)_2$-(N-2,6-dimethyl morpholinyl) and CH_2-(2-azetidinyl-N-tetrahydropyranyl).

7. A compound, or a pharmaceutically acceptable salt thereof, according to any one of claims 1 to 6, wherein R^7 is selected from the group consisting of H, fluoro, chloro, OH and NH_2.

8. A compound, or a pharmaceutically acceptable salt thereof, according to any one of claims 1 to 7, wherein R^8 is selected from the group consisting of CH_3, CH_2CH_3, $(CH_2)_3NH_2$, $(CH_2)_2OH$, $(CH_2)_3OH$ and $(CH_2)_2COOH$.

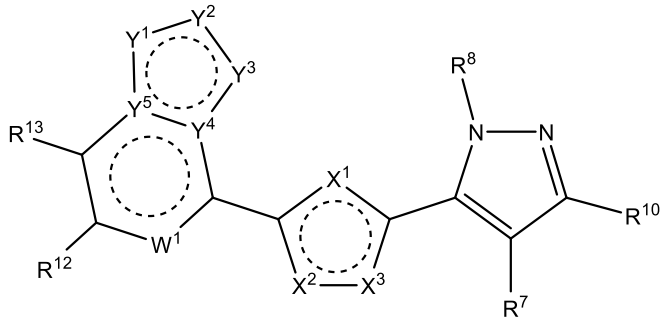
9. A compound, or a pharmaceutically acceptable salt thereof, according to any one of claims 1 to 8, wherein R^{10} is selected from the group consisting of CH_3 and CH_2OH.

10. A compound, or a pharmaceutically acceptable salt thereof, according to any one of claims 1 to 9, wherein R^{11} is selected from the group consisting of H and fluoro.

11. A compound, or a pharmaceutically acceptable salt thereof, according to any one of claims 1 to 10, wherein R^{12} is $-CONH_2$.

12. A compound, or a pharmaceutically acceptable salt thereof, according to any one of claims 1 to 11, wherein each R is independently selected from the group consisting of H, CH_3, and CH_2CF_3.

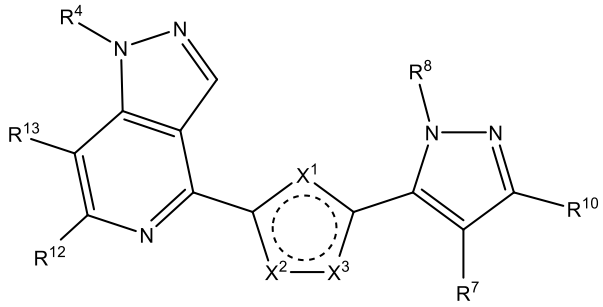
13. A compound, according to any one of claims 1 to 12, of formula (II)



(II)

or a pharmaceutically acceptable salt thereof.

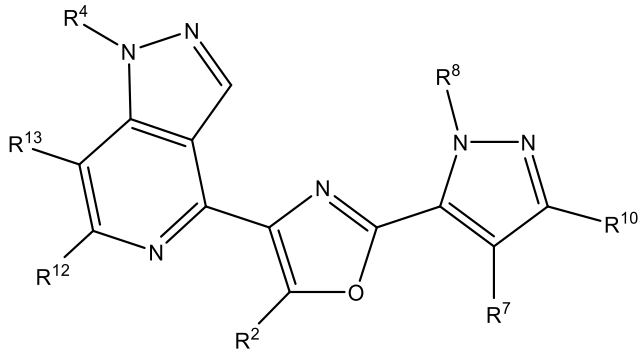
14. A compound, according to any one of claims 1 to 13, of formula (VII)



(VII)

or a pharmaceutically acceptable salt thereof.

15. A compound, according to any one of claims 1 to 14, of formula (VIID)



(VIID)

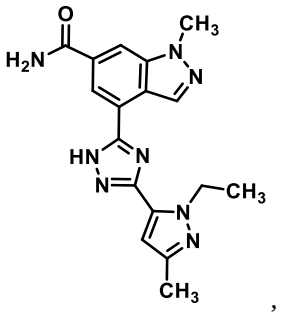
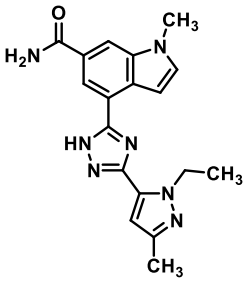
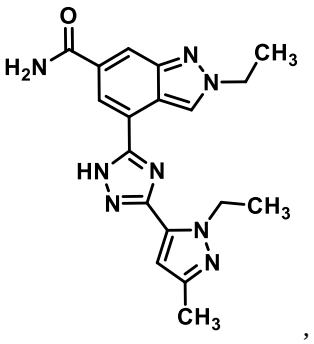
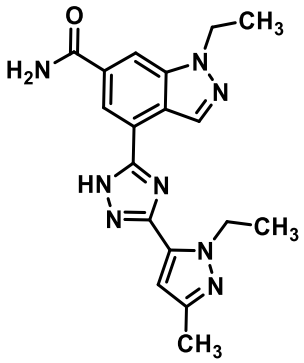
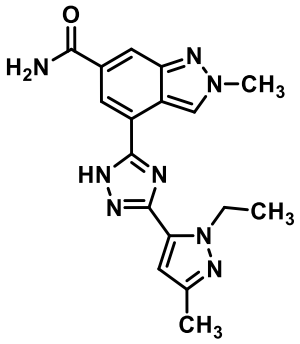
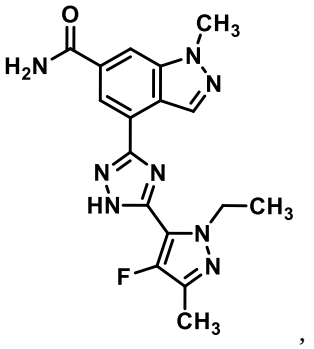
or a pharmaceutically acceptable salt thereof.

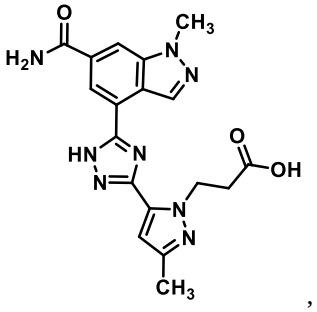
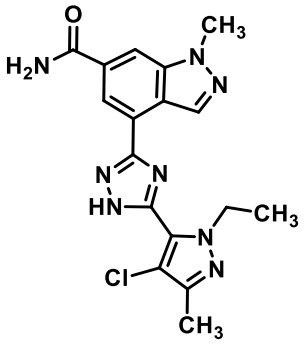
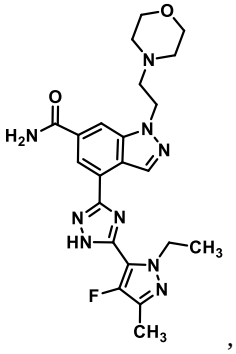
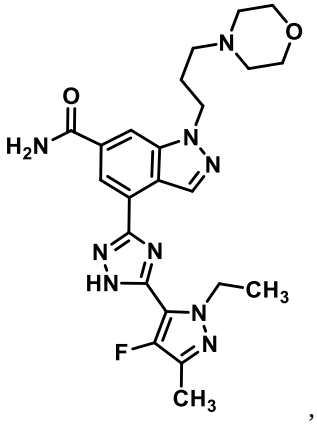
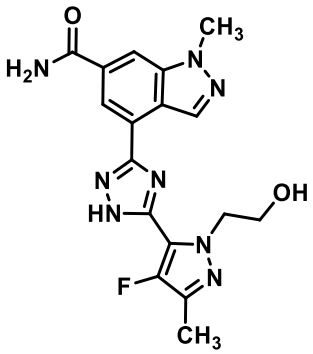
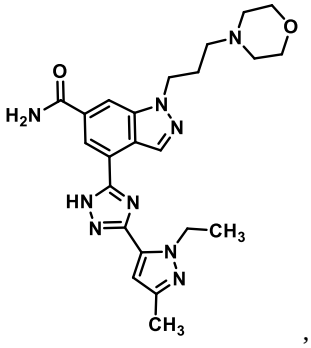
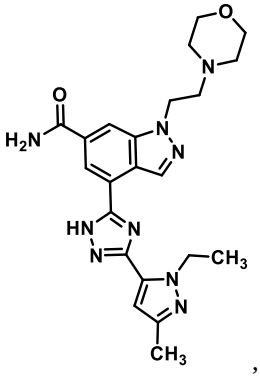
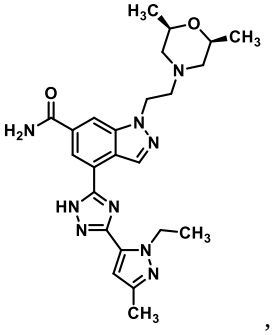
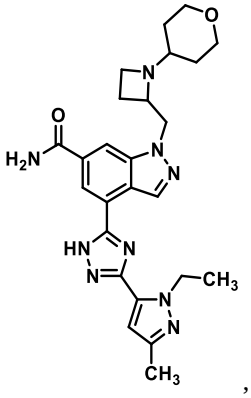
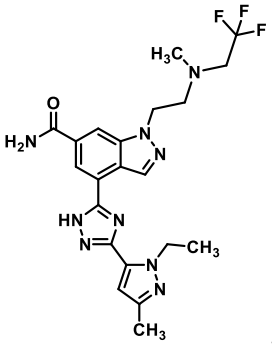
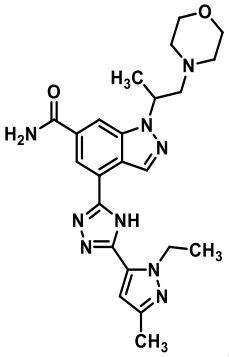
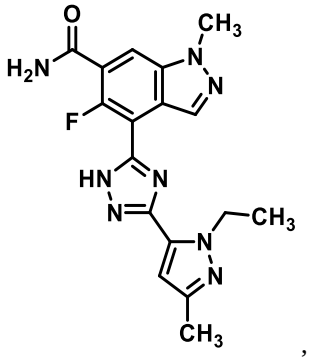
16. A compound, or a pharmaceutically acceptable salt thereof, according to any one of claims 1 to 15, wherein the compound, or pharmaceutically acceptable salt thereof, competitively binds to STING with an *in vitro* K_i of less than 0.750μM, preferably less than about 0.500μM, more preferably less than about 0.250μM, and even more preferably less than about 0.100μM.

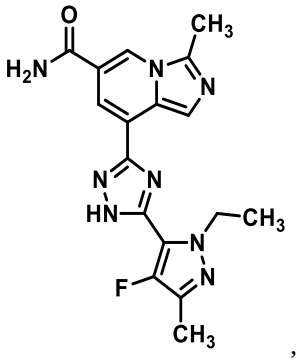
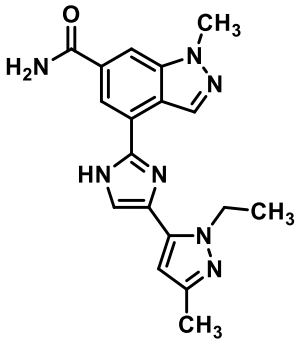
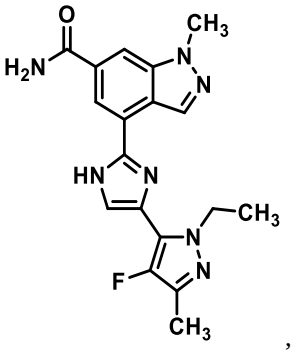
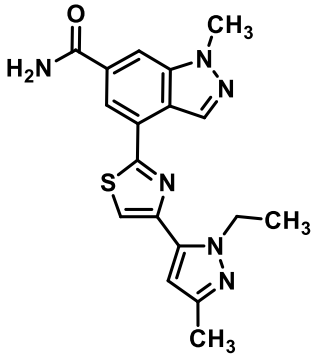
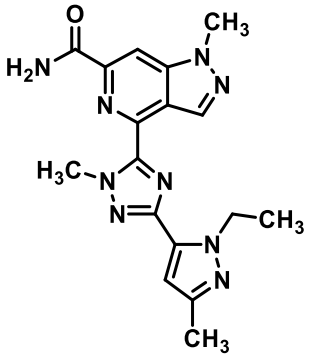
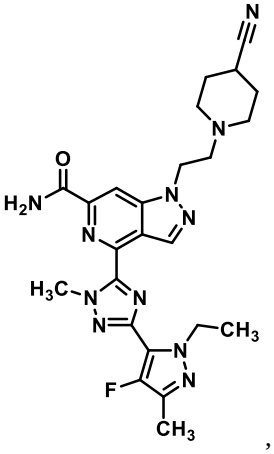
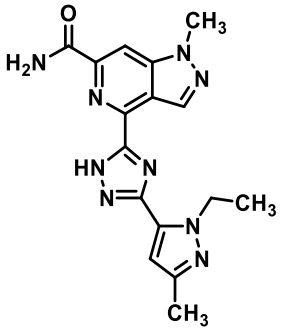
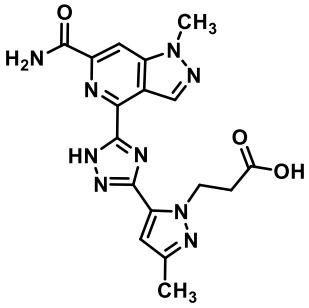
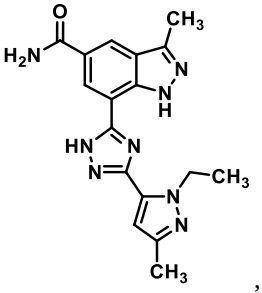
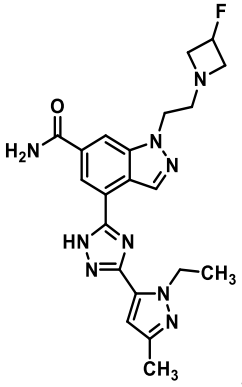
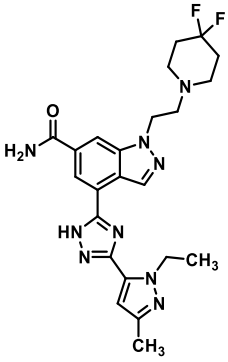
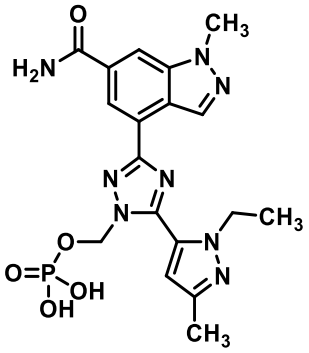
17. A compound, or a pharmaceutically acceptable salt thereof, according to any one of claims 1 to 16, wherein the compound, or pharmaceutically acceptable salt thereof, activates STING with an *in vitro* EC_{50} of about 100 μM or less, preferably about 50 μM or less, more preferably about 20 μM or less and most preferably about 10 μM or less when measured by monitoring phosphorylation of IRF3.

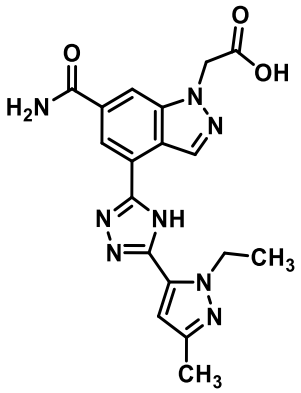
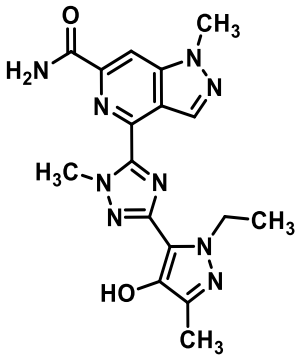
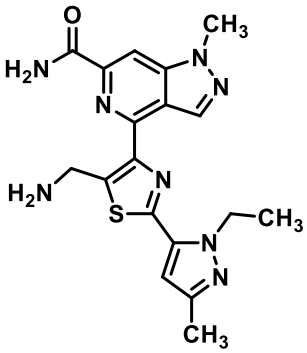
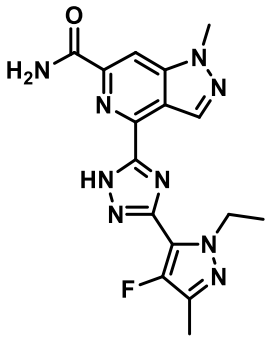
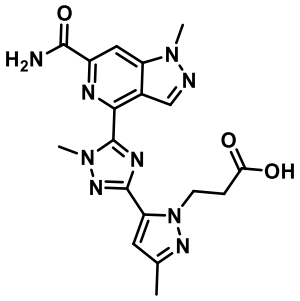
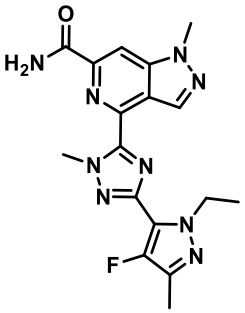
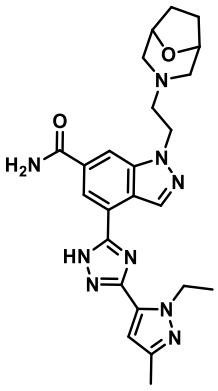
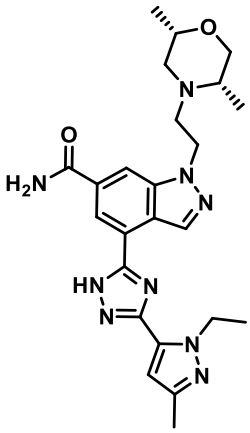
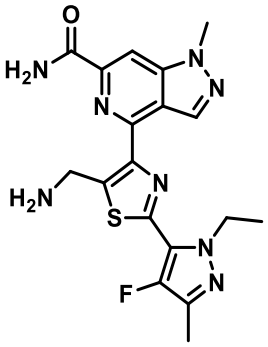
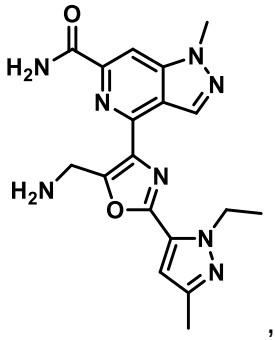
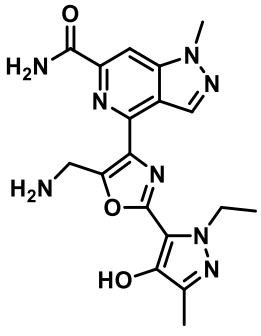
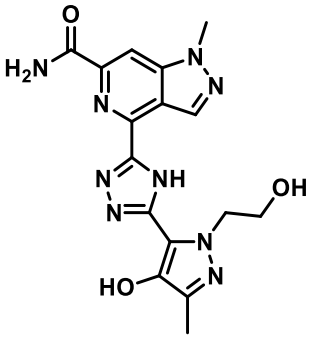
18. A compound, or a pharmaceutically acceptable salt thereof, according to any one of claims 1 to 17, wherein the compound, or pharmaceutically acceptable salt thereof, activates STING with an *in vitro* EC_{50} of about 100 μM or less, preferably about 50 μM or less, more preferably about 20 μM or less and most preferably about 10 μM or less when measured by monitoring interferon-β induction.

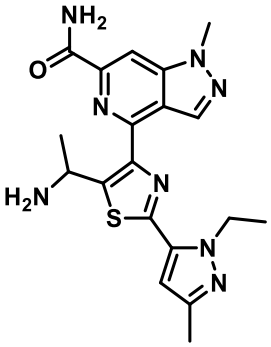
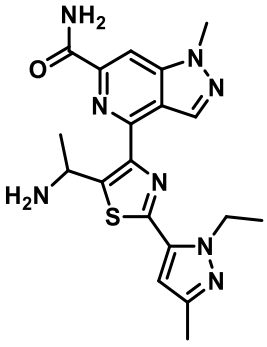
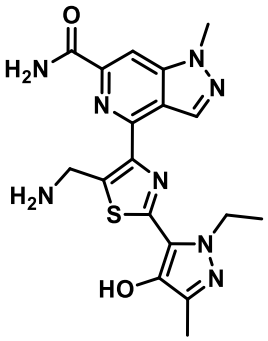
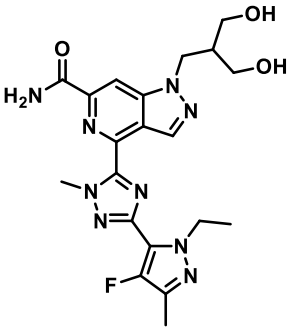
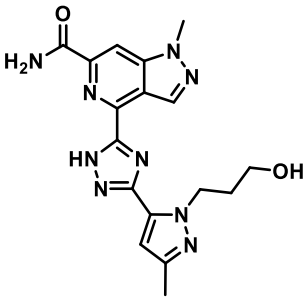
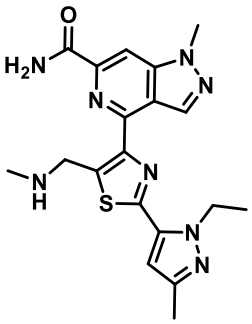
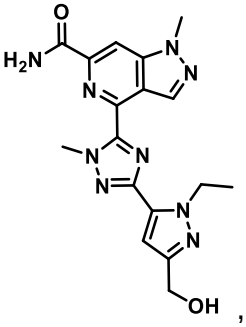
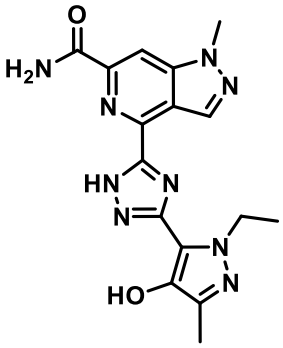
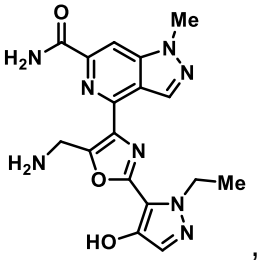
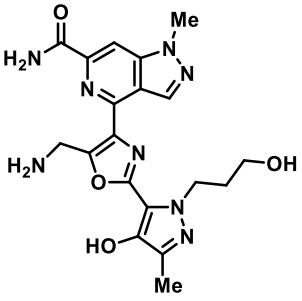
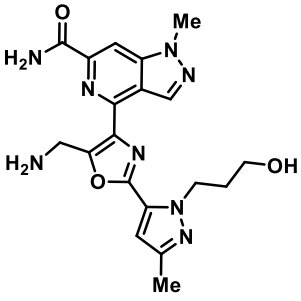
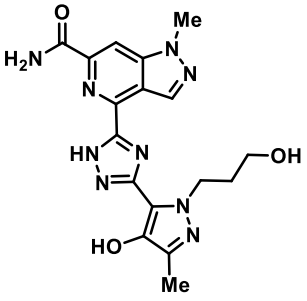
19. A compound selected from:

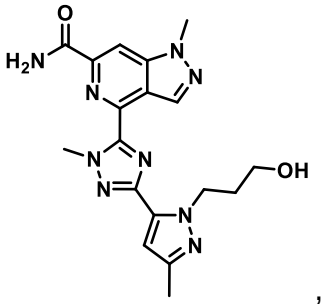
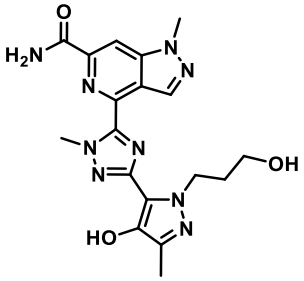
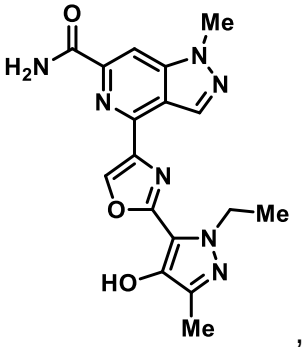
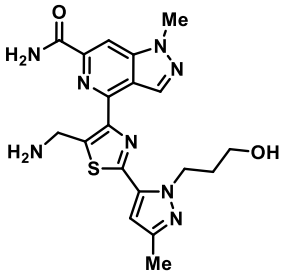
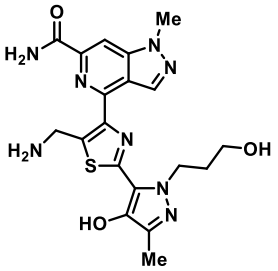
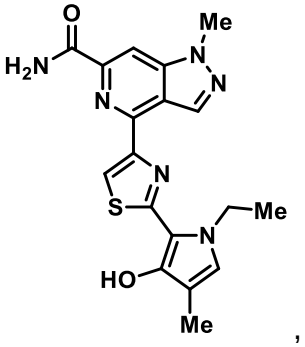

,

,

,

,

,

,


,

,

,

,

,

,

,

,

,

,

,

,

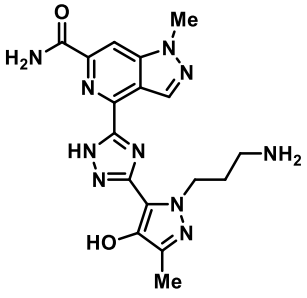

,

,

,

,

,

,

,

,

,

,

,

,


,

,

,

,

,

,

,

,

,

,

,

,


,

,

,

,

,

,

,

,

,

,

,

,


,

,

,

,

,

,

and……


,

or a pharmaceutically acceptable salt thereof.

20. A pharmaceutical composition comprising a compound, or a pharmaceutically acceptable salt thereof, according to any one of claims 1-19, and a pharmaceutically acceptable carrier.

21. A pharmaceutical composition comprising a compound, or a pharmaceutically acceptable salt thereof, according to any one of claims 1-19, wherein said compound is a component of an antibody-drug conjugate.

22. A pharmaceutical composition comprising a compound, or a pharmaceutically acceptable salt thereof, according to any one of claims 1-19, wherein said compound is a component of a particle-based delivery system.

23. Use of a compound, or a pharmaceutically acceptable salt thereof, according to any one of claims 1-19 in the manufacture of a medicament for the treatment of abnormal cell growth in a mammal, wherein a therapeutically effective amount of the medicament is to be administered to the mammal.

24. The use of claim 23, wherein the abnormal cell growth is cancer.

25. The use of claim 24, wherein the cancer is lung cancer, bone cancer, pancreatic cancer, skin cancer, cancer of the head or neck, cutaneous or intraocular melanoma, uterine cancer, ovarian cancer, rectal cancer, cancer of the anal region, stomach cancer, colon cancer, breast cancer, uterine cancer, carcinoma of the fallopian tubes, carcinoma of the endometrium, carcinoma of the cervix, carcinoma of the vagina, carcinoma of the vulva, Hodgkin's Disease, cancer of the esophagus, cancer of the small intestine, cancer of the endocrine system, cancer of the thyroid gland, cancer of the parathyroid gland, cancer of the adrenal gland, sarcoma of soft tissue, cancer of the urethra, cancer of the penis, prostate cancer, chronic or acute leukemia, lymphocytic lymphomas, cancer of the bladder, cancer of the kidney or ureter, renal cell carcinoma, carcinoma of the renal pelvis, neoplasms of the central nervous system (CNS), primary CNS lymphoma, spinal axis tumors, brain stem glioma, or pituitary adenoma.

26. The use of claim 25, wherein the cancer is bladder cancer.

27. The use of any one of claims 23 to 26, wherein the mammal is a human.

28. The use of any one of claims 23 to 27 which comprises an additional therapeutic agent to be administered.

29. The use of claim 28, wherein the additional therapeutic agent is selected from the group consisting of an interferon, a CTLA-4 pathway antagonist, an anti-4-1BB antibody, an anti-PD-1 antibody, and an anti-PD-L1 antibody.

30. Use of a compound, or a pharmaceutically acceptable salt thereof, according to any one of claims 1-19 in the manufacture of a medicament for the treatment of inflammatory diseases, allergic and autoimmune diseases, infectious diseases, or cancer, wherein the medicament is for upregulating the activity of STING in a mammal, and wherein an effective amount of the medicament is to be administered to the mammal.

31. Use of a compound, or a pharmaceutically acceptable salt thereof, according to any one of claims 1-19 in the manufacture of a medicament for the treatment of inflammatory diseases, allergic and autoimmune diseases, infectious diseases, or cancer, wherein the medicament is for increasing interferon-beta levels in a mammal, and wherein an effective amount of the medicament is to be administered to the mammal.

32. A compound, or a pharmaceutically acceptable salt thereof, according to any one of claims 1-19 for use in therapy.