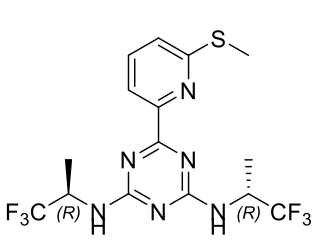
CLAIMS

1. A compound selected from: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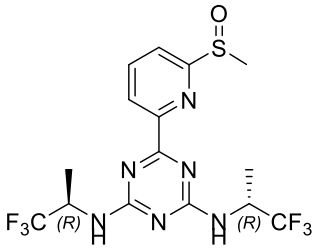
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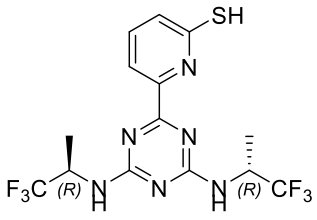
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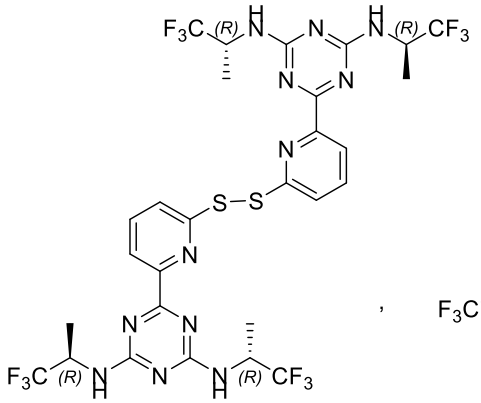
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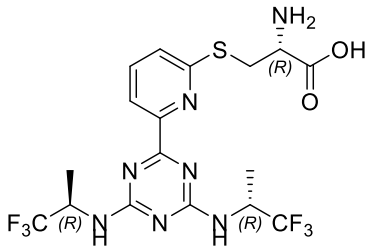
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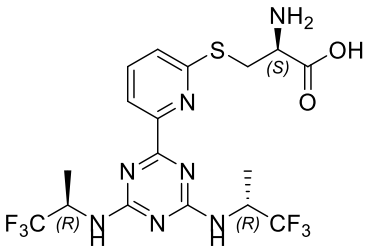
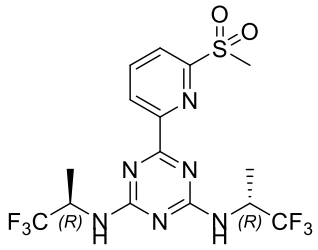
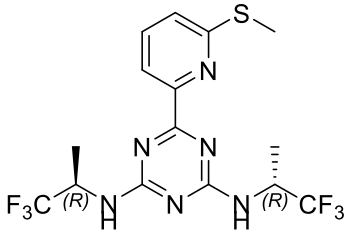


and

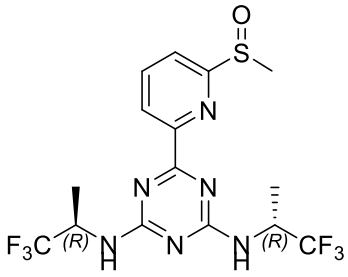


or a pharmaceutically acceptable salt thereof, in a purified form.

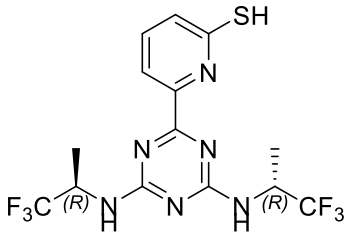
2. The compound of claim 1, wherein the compound is


, or a pharmaceutically acceptable salt thereof, in a purified form.

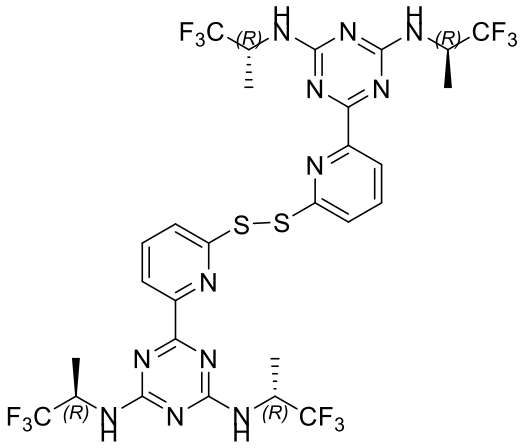
3. The compound of claim 1, wherein the compound is


, or a pharmaceutically acceptable salt thereof, in a purified form.

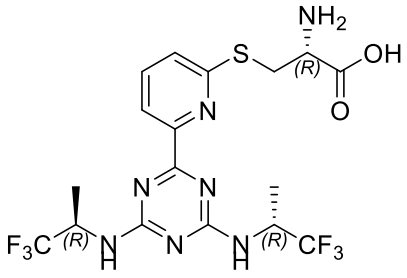
4. The compound of claim 1, wherein the compound is


, or a pharmaceutically acceptable salt thereof, in a purified form.

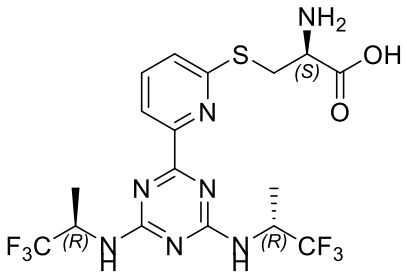
5. The compound of claim 1, wherein the compound is


, or a pharmaceutically acceptable salt thereof, in a purified form.

6. The compound of claim 1, wherein the compound is

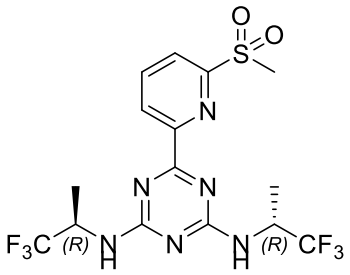

, or a pharmaceutically acceptable salt thereof, in a purified form.

7. The compound of claim 1, wherein the compound is



, or a pharmaceutically acceptable salt thereof, in a purified form.

8. The compound of claim 1, wherein the compound is



, or a pharmaceutically acceptable salt thereof, in a purified form.

9. A pharmaceutical composition comprising a compound according to claim 1, or a pharmaceutically acceptable salt thereof, and one or more pharmaceutically acceptable excipients.

10. A pharmaceutical composition comprising a compound of claim 2 or a pharmaceutically acceptable salt thereof, and one or more pharmaceutically acceptable excipients.

11. A pharmaceutical composition comprising a compound of claim 3 or a pharmaceutically acceptable salt thereof, and one or more pharmaceutically acceptable excipients.

12. A pharmaceutical composition comprising a compound of claim 4 or a pharmaceutically acceptable salt thereof, and one or more pharmaceutically acceptable excipients.

13. A pharmaceutical composition comprising a compound of claim 5 or a pharmaceutically acceptable salt thereof, and one or more pharmaceutically acceptable excipients.

14. A pharmaceutical composition comprising a compound of claim 6 or a pharmaceutically acceptable salt thereof, and one or more pharmaceutically acceptable excipients.

15. A pharmaceutical composition comprising a compound of claim 7 or a pharmaceutically acceptable salt thereof, and one or more pharmaceutically acceptable excipients.

16. A pharmaceutical composition comprising a compound of claim 8 or a pharmaceutically acceptable salt thereof, and one or more pharmaceutically acceptable excipients.

17. A purified compound of claim 1 or a pharmaceutically acceptable salt thereof for use in a method of treating a cancer, the method comprising administering to a patient in need thereof a therapeutically effective amount of a purified compound of claim 1 or a pharmaceutically acceptable salt thereof, wherein

the cancer is characterized by the presence of at least one mutation chosen from an IDH1 mutation and an IDH2 mutation.

18. A purified compound of claim 2 or a pharmaceutically acceptable salt thereof for use in a method of treating a cancer, the method comprising administering to a patient in need thereof a therapeutically effective amount of a purified compound of claim 2 or a pharmaceutically acceptable salt thereof, wherein the cancer is characterized by the presence of at least one mutation chosen from an IDH1 mutation and an IDH2 mutation.

19. A purified compound of claim 3 or a pharmaceutically acceptable salt thereof for use in a method of treating a cancer, the method comprising administering to a patient in need thereof a therapeutically effective amount of a purified compound of claim 3 or a pharmaceutically acceptable salt thereof, wherein the cancer is characterized by the presence of at least one mutation chosen from an IDH1 mutation and an IDH2 mutation.

20. A purified compound of claim 4 or a pharmaceutically acceptable salt thereof for use in a method of treating a cancer, the method comprising administering to a patient in need thereof a therapeutically effective amount of a purified compound of claim 4 or a pharmaceutically acceptable salt thereof, wherein the cancer is characterized by the presence of at least one mutation chosen from an IDH1 mutation and an IDH2 mutation.

21. A purified compound of claim 5 or a pharmaceutically acceptable salt thereof for use in a method of treating a cancer, the method comprising administering to a patient in need thereof a therapeutically effective amount of a purified compound of claim 5 or a pharmaceutically acceptable salt thereof, wherein the cancer is characterized by the presence of at least one mutation chosen from an IDH1 mutation and an IDH2 mutation.

22. TA purified compound of claim 6 or a pharmaceutically acceptable salt thereof for use in a method of treating a cancer, the method comprising administering to a patient in need thereof a therapeutically effective amount of a purified compound of claim 6 or a pharmaceutically acceptable salt thereof, wherein the cancer is characterized by the presence of at least one mutation chosen from an IDH1 mutation and an IDH2 mutation.

23. A purified compound of claim 7 or a pharmaceutically acceptable salt thereof for use in a method of treating a cancer, the method comprising administering to a patient in need thereof a therapeutically effective amount of a purified compound of claim 7or a pharmaceutically acceptable salt thereof, wherein the cancer is characterized by the presence of at least one mutation chosen from an IDH1 mutation and an IDH2 mutation.

24. A purified compound of claim 8 or a pharmaceutically acceptable salt thereof for use in a method of treating a cancer, the method comprising administering to a patient in need thereof a therapeutically effective amount of a purified compound of claim 8 or a pharmaceutically acceptable salt thereof, wherein the cancer is characterized by the presence of at least one mutation chosen from an IDH1 mutation and an IDH2 mutation.

25. A pharmaceutical composition of claim 9 for use in a method of treating a cancer, the method comprising administering to a patient in need thereof a therapeutically effective amount of a composition of claim 9, wherein the cancer is characterized by the presence of at least one mutation chosen from an IDH1 mutation and an IDH2 mutation.

26. The purified compound for use of claim 17, wherein the cancer is selected from glioma (including low grade glioma), glioblastoma (including secondary glioblastoma), grade II or III astrocytoma, grade II or III oligodendroglioma, acute myelogenous leukemia (AML), sarcoma, melanoma, non-small cell lung cancer (NSCLC), cholangiocarcinomas, chondrosarcoma, myelodysplastic syndromes (MDS), myeloproliferative neoplasm (MPN), colon cancer, and angio-immunoblastic non-Hodgkin's lymphoma (NHL) in a patient.

27. The purified compound for use of claim 26, wherein the cancer is glioma.

28. The purified compound for use of claim 27, wherein the glioma is a low grade glioma or a high grade glioma.

29. A purified compound of claim 1 for use in a method of treating a glioma in a subject in need thereof, the method comprising administering to the subject a therapeutically effective amount of a purified compound according to claim 1, or a pharmaceutically acceptable salt thereof, wherein the glioma is characterized by the presence of at least one mutation chosen from an IDH1 mutation and an IDH2 mutation.

30. A purified compound of claim 2 for use in a method of treating a glioma in a subject in need thereof, the method comprising administering to the subject a therapeutically effective amount of a purified compound according to claim 2, or a pharmaceutically acceptable salt thereof, wherein the glioma is characterized by the presence of at least one mutation chosen from an IDH1 mutation and an IDH2 mutation.

31. A purified compound of claim 3 for use in a method of treating a glioma in a subject in need thereof, the method comprising administering to the subject a therapeutically effective amount of a purified compound according to claim 3, or a pharmaceutically acceptable salt thereof, wherein the glioma

is characterized by the presence of at least one mutation chosen from an IDH1 mutation and an IDH2 mutation.

32. A purified compound of claim 4 for use in a method of treating a glioma in a subject in need thereof, the method comprising administering to the subject a therapeutically effective amount of a purified compound according to claim 4, or a pharmaceutically acceptable salt thereof, wherein the glioma is characterized by the presence of at least one mutation chosen from an IDH1 mutation and an IDH2 mutation.

33. A purified compound of claim 5 for use in a method of treating a glioma in a subject in need thereof, the method comprising administering to the subject a therapeutically effective amount of a purified compound according to claim 5, or a pharmaceutically acceptable salt thereof, wherein the glioma is characterized by the presence of at least one mutation chosen from an IDH1 mutation and an IDH2 mutation.

34. A purified compound of claim 6 for use in a method of treating a glioma in a subject in need thereof, the method comprising administering to the subject a therapeutically effective amount of a purified compound according to claim 6, or a pharmaceutically acceptable salt thereof, wherein the glioma is characterized by the presence of at least one mutation chosen from an IDH1 mutation and an IDH2 mutation.

35. A purified compound of claim 7 for use in a method of treating a glioma in a subject in need thereof, the method comprising administering to the subject a therapeutically effective amount of a purified compound according to claim 7, or a pharmaceutically acceptable salt thereof, wherein the glioma is characterized by the presence of at least one mutation chosen from an IDH1 mutation and an IDH2 mutation.

36. A purified compound of claim 8 for use in a method of treating a glioma in a subject in need thereof, the method comprising administering to the subject a therapeutically effective amount of a purified compound according to claim 8, or a pharmaceutically acceptable salt thereof, wherein the glioma is characterized by the presence of at least one mutation chosen from an IDH1 mutation and an IDH2 mutation.

37. A pharmaceutical composition of claim 9 for use in a method of treating a glioma in a subject in need thereof, the method comprising administering to a patient in need thereof a therapeutically effective amount of a composition of claim 9, wherein the glioma is characterized by the presence of at least one mutation chosen from an IDH1 mutation and an IDH2 mutation.

38. The purified compound for use of claim 17, wherein the mutation is an IDH1 mutation.

39. The purified compound for use of claim 38, wherein the IDH1 mutation is an R132X mutation.

40. The purified compound for use of claim 39, wherein the IDH1 mutation is an R132H or R132C mutation.

41. The purified compound for use claim 17, wherein the mutation is an IDH2 mutation.

42. The purified compound for use of claim 41, wherein the mutation is a R140X or R172X mutation.

43. The purified compound for use of claim 42, wherein the mutation is a R140Q, R140W, or an R140L mutation.

44. The purified compound for use of claim 42, wherein the mutation is an R172K or R172G mutation.

45. The purified compound for use of claim 17, wherein the amount of the purified compound or pharmaceutically acceptable salt thereof administered to the patient is between about 1 and 5000 mg/day.

46. The purified compound for use of claim 45, wherein the amount of the purified compound or pharmaceutically acceptable salt thereof administered to the patient is between about 1 and 1000 mg/day.

47. The purified compound for use of claim 45, wherein the amount of the purified compound or pharmaceutically acceptable salt thereof administered to the patient is between about 1 and 500 mg/day.

48. The purified compound for use of claim 17 wherein the purified compound or composition is administered orally.

49. The purified compound for use claim 17 wherein the purified compound or composition is administered in combination with an additional therapeutic modality.

50. The purified compound for use of claim 49 wherein the additional therapeutic modality is selected from radiation, surgical resection, anti-cancer medications, anti-epileptic medications, anti-seizure medications and anti-emesis medications.

51. The purified compound for use of claim 50, wherein the anti-cancer medications are selected from chemotherapy with cytotoxic or cytostatic agents, targeted medications, antibody therapy, immunotherapy and hormonal therapy.