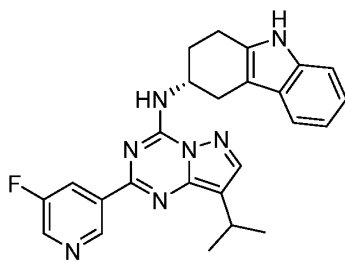


CLAIMS

1. A method of treating cancer, comprising selecting a patient who is AHR nuclear positive, and administering to the patient a therapeutically effective amount of an AHR inhibitor.
2. The method of claim 1, wherein the cancer is selected from bladder cancer, melanoma, ovarian cancer, and HNSCC.
3. The method of claim 1 or 2, wherein selecting a patient who is AHR nuclear positive comprises IHC staining a tumor biopsy core of a patient.
4. The method of claim 3, wherein selecting a patient who is AHR nuclear positive comprises selecting a patient having about 5% or more cells in a tumor biopsy core which are AHR nuclear staining positive.
5. The method of claim 4, wherein selecting a patient who is AHR nuclear positive comprises selecting a patient having about 20% or more cells in a tumor biopsy core which are AHR nuclear staining positive.
6. The method of claim 5, wherein selecting a patient who is AHR nuclear positive comprises selecting a patient having about 50% or more cells in a tumor biopsy core which are AHR nuclear staining positive.
7. The method of any one of claims 4-6, wherein the tumor biopsy core is a tumor region of the tumor biopsy core.
8. The method of any one of claims 4-6, wherein the tumor biopsy core is a tumor microenvironment (or stroma) region of the tumor biopsy core.
9. The method of any one of claims 4-6, wherein staining positive refers to all staining intensity (including 1+, 2+, and 3+ intensities) by CTA scoring.

10. The method of any one of claims 4-6, wherein staining positive refers to pooled 2+ and 3+ staining intensity by CTA scoring.

11. The method of claim 1 or 2, wherein the AHR inhibitor is Compound A:



or a pharmaceutically acceptable salt thereof.

12. A method of treating bladder cancer in a patient, comprising:

IHC staining a tumor tissue of a patient;

selecting a patient having about 5%, 20%, or 50%, or more cells in a tumor region of a tumor biopsy core which are AHR nuclear staining positive at all staining intensity (including 1+, 2+, and 3+ intensities) or at pooled 2+ and 3+ staining intensity by CTA scoring; and

administering to the patient a therapeutically effective amount of Compound A, or a pharmaceutically acceptable salt thereof.

13. A method of treating HNSCC in a patient, comprising:

IHC staining a tumor tissue of a patient;

selecting a patient having about 5%, 20%, or 50%, or more cells in a tumor region of a tumor biopsy core which are AHR nuclear staining positive at all staining intensity (including 1+, 2+, and 3+ intensities) or at pooled 2+ and 3+ staining intensity by CTA scoring; and

administering to the patient a therapeutically effective amount of Compound A, or a pharmaceutically acceptable salt thereof.

14. A method of treating ovarian cancer in a patient, comprising:
 - IHC staining a tumor tissue of a patient;
 - selecting a patient having about 5%, 20%, or 50%, or more cells in a tumor region of a tumor biopsy core which are AHR nuclear staining positive at all staining intensity (including 1+, 2+, and 3+ intensities) or at pooled 2+ and 3+ staining intensity by CTA scoring; and
 - administering to the patient a therapeutically effective amount of Compound A, or a pharmaceutically acceptable salt thereof.
15. A method of treating melanoma in a patient, comprising:
 - IHC staining a tumor tissue of a patient;
 - selecting a patient having about 5%, 20%, or 50%, or more cells in a tumor region of a tumor biopsy core which are AHR nuclear staining positive at all staining intensity (including 1+, 2+, and 3+ intensities) or at pooled 2+ and 3+ staining intensity by CTA scoring; and
 - administering to the patient a therapeutically effective amount of Compound A, or a pharmaceutically acceptable salt thereof.
16. A method for identifying or selecting a cancer patient who is AHR nuclear positive, comprising IHC staining a tumor tissue of a patient, and selecting a patient who is AHR nuclear staining positive.
17. The method of claim 16, wherein selecting a patient who is AHR nuclear staining positive comprises selecting a patient having about 5% or more cells in a tumor biopsy core which are staining positive.
18. The method of claim 16, wherein selecting a patient who is AHR nuclear staining positive comprises selecting a patient having about 20% or more cells in a tumor biopsy core which are staining positive.

19. The method of claim 16, wherein selecting a patient who is AHR nuclear staining positive comprises selecting a patient having about 50% or more cells in a tumor biopsy core which are staining positive.
20. The method of any one of claims 17-19, wherein the tumor biopsy core is a tumor region of the tumor biopsy core.
21. The method of any one of claims 17-19, wherein the tumor biopsy core is a tumor microenvironment (or stroma) region of the tumor biopsy core.
22. The method of any one of claims 17-19, wherein staining positive refers to all staining intensity (including 1+, 2+, and 3+ intensities) by CTA scoring.
23. The method of any one of claims 17-19, wherein staining positive refers to pooled 2+ and 3+ staining intensity by CTA scoring.
24. The method of claim 16, wherein the tumor tissue is a bladder tumor tissue, a melanoma tissue, an ovarian tumor tissue, or an HNSCC tumor tissue.
25. A method for IHC staining a tumor tissue of a patient, comprising staining a tumor tissue section using AHR monoclonal antibody FF3399.
26. The method of claim 25, further comprising measuring staining intensity in a tumor biopsy core.
27. A method of treating cancer comprising selecting a patient who has an AHR gene amplification and administering to the patient a therapeutically effective amount of an AHR antagonist.
28. The method of claim 27, wherein the selecting a patient who has an AHR gene amplification comprises using Next Generation Sequencing (NGS), RNAscope, or fluorescent *in situ* hybridization (FISH) to identify the AHR gene amplification.

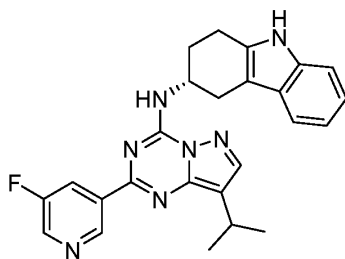
29. The method of claims 27 or 28, wherein the AHR gene amplification is determined by assaying cells from a tumor sample.

30. The method of any one of claims 27-29, wherein about 10% of the cells from the tumor sample have at least about three copies of AHR.

31. The method of any one of claims 27-30, wherein the cancer is selected from bladder cancer, melanoma, ovarian cancer, and HNSCC.

32. The method of any one of claims 27-31, wherein the AHR antagonist is:

(i) Compound A:



or a pharmaceutically acceptable salt thereof; or

(ii) a metabolite of Compound A, or a pharmaceutically acceptable salt thereof, or a prodrug thereof.

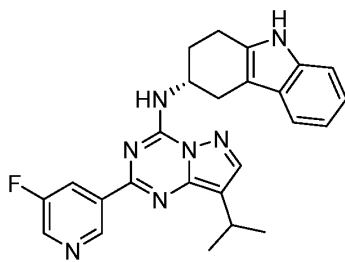
33. A method of treating cancer in a patient who has an AHR gene amplification comprising administering to the patient a therapeutically effective amount of an AHR antagonist.

34. The method of claim 33, wherein about 10% of the cells from a tumor sample from the patient have at least about three copies of AHR.

35. The method of claims 33 or 34, wherein the cancer is selected from bladder cancer, melanoma, ovarian cancer, and HNSCC.

36. The method of any one of claims 33-35, wherein the AHR antagonist is:

(i) Compound A:



or a pharmaceutically acceptable salt thereof; or

(ii) a metabolite of Compound A, or a pharmaceutically acceptable salt thereof, or a prodrug thereof.

37. A method of treating cancer in a patient who is AHR nuclear positive comprising administering to the patient a therapeutically effective amount of an AHR antagonist.

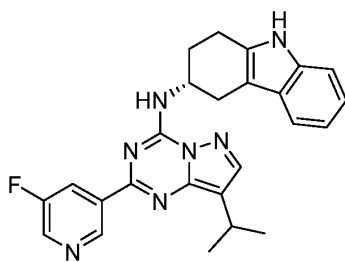
38. The method of claim 37, wherein the patient who is AHR nuclear positive has about 5% or more cells in a tumor sample which are AHR nuclear staining positive.

39. The method of claim 38, wherein the tumor sample is a tumor biopsy core of the patient.

40. The method of any one of claims 37-39, wherein the cancer is selected from bladder cancer, melanoma, ovarian cancer, and HNSCC.

41. The method of any one of claims 37-40, wherein the AHR antagonist is:

(i) Compound A:



or a pharmaceutically acceptable salt thereof; or

(ii) a metabolite of Compound A, or a pharmaceutically acceptable salt thereof, or a prodrug thereof.