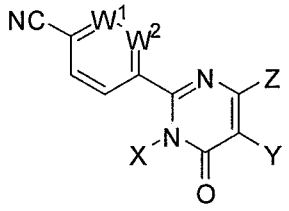
**[0010]** One embodiment provides a method of regulating gene transcription in a cell comprising inhibiting lysine-specific demethylase 1 activity by exposing the lysine-specific demethylase 1 enzyme to a compound of Formula (II).

**[0011]** One embodiment provides a method of treating cancer in a patient in need thereof, comprising administering to the patient a compound of Formula (II), or a pharmaceutically acceptable salt thereof.

**[0011a]** One embodiment provides a compound having the structure of Formula (I), or a pharmaceutically acceptable salt thereof,




(I)

wherein,

$W^1$ and $W^2$ are independently chosen from N, C-H, or C-F;

X is chosen from optionally substituted cycloalkyl, optionally substituted heterocyclyl, optionally substituted cycloalkylalkyl, optionally substituted heterocyclylalkyl, optionally substituted aralkyl, optionally substituted heteroarylalkyl, optionally substituted aryl, or optionally substituted heteroaryl;

Y is chosen from hydrogen, halogen, optionally substituted alkyl, or optionally substituted cycloalkylalkyl; and

Z is chosen from an optionally substituted group chosen from *N*-heterocyclyl, -O-heterocyclylalkyl, -N(H)-heterocyclylalkyl, or -N(Me)-heterocyclylalkyl.

**[0011b]** One embodiment provides the use of a compound of Formula (I) as described herein, wherein WI is C-F, W2 is CH, Y is H, X is optionally substituted aryl, Z is optionally substituted N-heterocyclyl, in the manufacture of a medicament for regulating gene transcription in a cell by inhibiting lysine-specific demethylase 1 for treating acute myeloid leukemia, breast or prostate cancer.

**[0011c]** One embodiment provides the use of a compound of Formula (I) as described herein, or a pharmaceutically acceptable salt thereof in the manufacture of a medicament for treating acute myeloid leukemia, breast or prostate cancer in a patient in need thereof.

## INCORPORATION BY REFERENCE

**[0012]** All publications, patents, and patent applications mentioned in this specification are herein incorporated by reference to the same extent as if each individual

publication, patent, or patent application was specifically and individually indicated to be incorporated by reference.

## DETAILED DESCRIPTION OF THE INVENTION

**[0013]** As used herein and in the appended claims, the singular forms "a," "and," and "the" include plural referents unless the context clearly dictates otherwise. Thus, for example, reference to "an agent" includes a plurality of such agents, and reference to "the cell" includes reference to one or more cells (or to a plurality of cells) and equivalents thereof known to those skilled in the art, and so forth. When ranges are used herein for physical properties, such as molecular weight, or chemical properties, such as chemical formulae, all combinations and subcombinations of ranges and specific embodiments therein are intended to be included. The term "about" when referring to a number or a numerical range means that the number or numerical range referred to is an approximation within experimental variability (or within statistical experimental error), and thus the number or numerical range may vary between 1% and 15% of the stated number or numerical range. The term "comprising" (and related terms such as "comprise" or "comprises" or "having" or "including") is not intended to exclude that in other certain embodiments, for example, an embodiment of any composition of matter, composition, method, or process, or the like, described herein, may "consist of" or "consist essentially of" the described features.

**Definitions**

**[0014]** As used in the specification and appended claims, unless specified to the contrary, the following terms have the meaning indicated below.

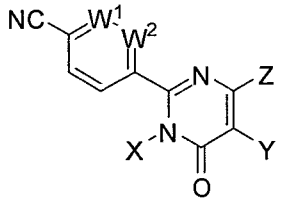
**[0015]** "Amino" refers to the $-NH_2$ radical.

**[0016]** "Cyano" refers to the -CN radical.

## CLAIMS

We Claim:

1. A compound having the structure of Formula (I), or a pharmaceutically acceptable salt thereof,



(I)

wherein,

$W^1$ and $W^2$ are independently chosen from N, C-H, or C-F;

X is chosen from optionally substituted cycloalkyl, optionally substituted heterocyclyl, optionally substituted cycloalkylalkyl, optionally substituted heterocyclylalkyl, optionally substituted aralkyl, optionally substituted heteroarylalkyl, optionally substituted aryl, or optionally substituted heteroaryl;

Y is chosen from hydrogen, halogen, optionally substituted alkyl, or optionally substituted cycloalkylalkyl; and

Z is chosen from an optionally substituted group chosen from *N*-heterocyclyl, -O-heterocyclylalkyl, -N(H)-heterocyclylalkyl, or -N(Me)-heterocyclylalkyl.

2. The compound or pharmaceutically acceptable salt of claim 1, wherein $W^2$ is C-H.

3. The compound or pharmaceutically acceptable salt of claim 1 or 2, wherein $W^1$ is C-F.

4. The compound or pharmaceutically acceptable salt of claim 1 or 2, wherein $W^1$ is C-H.

5. The compound or pharmaceutically acceptable salt of claim 1 or 2, wherein $W^1$ is N.

6. The compound or pharmaceutically acceptable salt of claims 1-5, wherein X is optionally substituted aryl, or optionally substituted heteroaryl.

7. The compound or pharmaceutically acceptable salt of claims 1-5, wherein X is optionally substituted aryl.

8. The compound or pharmaceutically acceptable salt of claim 7, wherein the optionally substituted aryl is an optionally substituted phenyl.

9. The compound or pharmaceutically acceptable salt of claims 1-5, wherein X is optionally substituted heteroaryl.

10. The compound or pharmaceutically acceptable salt of claim 9, wherein the optionally substituted heteroaryl is chosen from an optionally substituted pyridinyl, optionally substituted pyrimidinyl, optionally substituted pyrazinyl, optionally substituted pyrazolyl, optionally substituted indazolyl, optionally substituted azaindazolyl, optionally substituted isoindazolyl, optionally substituted indolyl, or optionally substituted azaindolyl.

11. The compound or pharmaceutically acceptable salt of claims 1-10, wherein Z is an optionally substituted -O-heterocyclylalkyl.

12. The compound or pharmaceutically acceptable salt of claims 1-10, wherein Z is an optionally substituted -N(H)-heterocyclylalkyl.

13. The compound or pharmaceutically acceptable salt of claims 1-10, wherein Z is an optionally substituted -N(Me)-heterocyclylalkyl.

14. The compound or pharmaceutically acceptable salt of claims 11-13, wherein the heterocyclylalkyl group has the formula $-R^c$-heterocyclyl and the $R^c$ is an optionally substituted $C_1$-$C_3$ alkylene chain.

15. The compound or pharmaceutically acceptable salt of claims 11-13, wherein the heterocyclylalkyl group has the formula $-R^c$-heterocyclyl and the $R^c$ is an optionally substituted $C_1$ alkylene chain.

16. The compound or pharmaceutically acceptable salt of claims 11-13, wherein the heterocyclylalkyl group has the formula $-R^c$-heterocyclyl and the heterocyclyl is an optionally substituted nitrogen-containing 4-, 5-, 6-, or 7-membered heterocyclyl.

17. The compound or pharmaceutically acceptable salt of claims 1-10, wherein Z is an optionally substituted *N*-heterocyclyl.

18. The compound or pharmaceutically acceptable salt of claim 17, wherein the optionally substituted *N*-heterocyclyl is a 4-, 5-, 6-, or 7-membered N-heterocyclyl.

19. The compound or pharmaceutically acceptable salt of claim 17, wherein the optionally substituted *N*-heterocyclyl is a 6-membered N-heterocyclyl.

20. The compound or pharmaceutically acceptable salt of claim 17, wherein the optionally substituted *N*-heterocyclyl is an optionally substituted piperidine.

21. The compound or pharmaceutically acceptable salt of claim 20, wherein the optionally substituted piperidine is an optionally substituted 4-aminopiperidine.

22. The compound or pharmaceutically acceptable salt of claims 1-21, wherein Y is hydrogen.

23. The compound or pharmaceutically acceptable salt of claims 1-21, wherein Y is halogen.

24. The compound or pharmaceutically acceptable salt of claims 1-21, wherein Y is optionally substituted cycloalkylalkyl.

25. The compound or pharmaceutically acceptable salt of claims 1-21, wherein Y is optionally substituted alkyl.

26. The compound or pharmaceutically acceptable salt of claim 25, wherein the optionally substituted alkyl is an optionally substituted $C_1$-$C_3$ alkyl.

27. The compound or pharmaceutically acceptable salt of claim 25, wherein the optionally substituted alkyl is an optionally substituted $C_1$ alkyl.

28. The compound or pharmaceutically acceptable salt of claim 25, wherein the optionally substituted alkyl is a methyl group.

29. A pharmaceutical composition comprising a compound of Formula (I) of claim 1, or a pharmaceutically acceptable salt thereof, and a pharmaceutically acceptable excipient.

30. Use of a compound of Formula (I) of claim 1, wherein WI is C-F, W2 is CH, Y is H, X is optionally substituted aryl, Z is optionally substituted N-heterocyclyl, in the manufacture of a medicament for regulating gene transcription in a cell by inhibiting lysine-specific demethylase 1 for treating acute myeloid leukemia, breast or prostate cancer.

31. Use of a compound of Formula (I) of claim 1, or a pharmaceutically acceptable salt thereof in the manufacture of a medicament for treating acute myeloid leukemia, breast or prostate cancer in a patient in need thereof.