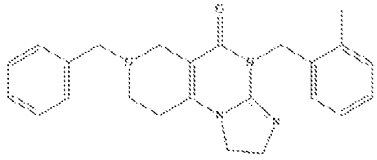
CLAIMS

What is claimed is:

1. A method of treating or preventing cancer in a subject in need thereof, comprising: administering to the subject in need of such treatment a pharmaceutical composition comprising a therapeutically effective amount compound (**1**)



(**1**)

or a pharmaceutically acceptable salt thereof, wherein the cancer involves a midline structure of the brain and has a histone H3 K27M mutation.

2. The method according to claim **1**, wherein the cancer involves the thalamus, medulla, hypothalamus, basal ganglia, pineal gland, midbrain, cerebellum, pons, or spinal cord.

3. The method according to claim **1**, wherein the histone H3 K27M mutation is H3.3 K27M or H3.1 K27M.

4. The method according to claim **1**, wherein the histone H3 K27M mutation is in one or more histone genes selected from *H3F3A, H3F3B, HIST1H3A, HIST1H3B, HIST1H3C, HIST1H3D, HIST1H3E, HIST1H3F, HIST1H3G, HIST1H3H, HIST1H3I,* or *HIST1H3J.*

5. The method according to claim **1**, wherein in cancerous tissue DRD2 is overexpressed, DRD5 is underexpressed, or both.

6. The method according to claim **1**, wherein the subject is a human.

7. The method according to claim **1**, wherein the subject is a domesticated pet.

8. The method according to claim **1**, wherein the subject is a pediatric subject.

9. A method of treating or preventing cancer in a subject in need thereof, comprising: administering to the subject in need of such treatment a pharmaceutical composition comprising a therapeutically effective amount a compound of formula (**10**) or an analog thereof, or a pharmaceutically acceptable salt thereof, wherein the cancer has a histone H3 mutation.

10. The method according to claim **9**, wherein the cancer is selected from the group consisting of a central nervous system tumor, a brain tumor, a peripheral nervous system tumor, a pheochromocytoma, a paraganglioma, an adrenal cortical carcinoma, an adrenal tumor, and a neuroendocrine tumor.

11. The method according to claim **9**, wherein the cancer comes from glial cells and is selected from the group consisting of meningioma, ependymoma, oligodendrogliomas, astrocytoma, optic nerve glioma, pineal tumors, rhabdoid tumors, and diffuse intrinsic pontine glioma; or wherein the cancer comes from neural cells and is selected from the group consisting of medulloblastoma, neuroblastoma, ganglioma, primitive neuro-ectodermal tumors, and schwannoma.

12. The method according to claim **9**, wherein the cancer involves the thalamus, medulla, hypothalamus, basal ganglia, pineal gland, midbrain, cerebellum, pons, or spinal cord.

13. The method according to claim **9**, wherein the histone H3 mutation is H3.3 K27M or H3.1 K27M.

14. The method according to claim **9**, wherein the cancer has a K27M mutation in one or more histone genes selected from *H3F3A, H3F3B, HIST1H3A, HIST1H3B, HIST1H3C, HIST1H3D, HIST1H3E, HIST1H3F, HIST1H3G, HIST1H3H, HIST1H3I,* or *HIST1H3J*.

15. The method according to claim **9**, wherein DRD2 is overexpressed in cancerous tissue, DRD5 is underexpressed, or both.

16. The method according to claim **9**, wherein the subject is a human.

17. The method according to claim **9**, wherein the subject is a domesticated pet.

18. The method according to claim **9**, wherein the compound is ONC201.

19. The method according to claim **9**, wherein the subject is a pediatric subject.

20. A method of treating or preventing cancer in a subject in need thereof, comprising: administering to the subject in need of such treatment a pharmaceutical composition comprising a therapeutically effective amount a compound of formula (**10**) or an analog thereof, or a pharmaceutically acceptable salt thereof, wherein the cancer involves a midline structure of the brain.

21. The method according to claim **20**, wherein the cancer involves the thalamus, medulla, hypothalamus, basal ganglia, pineal gland, midbrain, cerebellum, pons, or spinal cord.

22. The method according to claim **20**, wherein the cancer has a histone H3 mutation, wherein the histone H3 mutation is H3.3 K27M or H3.1 K27M.

23. The method according to claim **20**, wherein the cancer has a histone H3 K27M mutation in one or more histone genes selected from *H3F3A, H3F3B, HIST1H3A, HIST1H3B, HIST1H3C, HIST1H3D, HIST1H3E, HIST1H3F, HIST1H3G, HIST1H3H, HIST1H3I,* or *HIST1H3J*.

24. The method according to claim **20**, wherein DRD2 is overexpressed in cancerous tissue, DRD5 is underexpressed, or both.

25. The method according to claim **20**, wherein the subject is a human.

26. The method according to claim **20**, wherein the subject is a domesticated pet.

27. The method according to claim **20**, wherein the compound is ONC201.

28. The method according to claim **20**, wherein the subject is a pediatric subject.