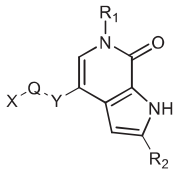
Claims

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



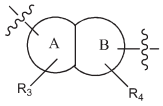
Formula (I)

wherein,

R_1 and R_2 are each independently selected from H, C_{1-6} alkyl, C_{1-6} alkoxy, C_{6-10} aryl or C_{5-10} heteroaryl, wherein the C_{1-6} alkyl, C_{1-6} alkoxy, C_{6-10} aryl or C_{5-10} heteroaryl is optionally substituted by C_{1-6} alkyl, $-NH_2$, -OH, C_{6-10} aryl or C_{5-10} heteroaryl; and the C_{5-10} heteroaryl has 1, 2, or 3 heteroatoms independently selected from nitrogen, oxygen or sulfur;

Q is absent or selected from C_{1-6} alkylene, $-SO_2-$ or -NH-, wherein the C_{1-6} alkylene or -NH- is optionally substituted by halogen, C_{1-6} alkyl or C_{1-6} alkoxy;

X is selected from H, C_{1-6} alkyl, C_{6-10} aryl or C_{5-10} heteroaryl, wherein the C_{1-6} alkyl, C_{6-10} aryl or C_{5-10} heteroaryl is optionally substituted by halogen, halo C_{1-6} alkyl, C_{1-6} alkyl, C_{1-6} alkoxy, C_{1-6} alkylthio, C_{1-6} alkoxycarbonyl or C_{1-6} alkyl-SO_2-;

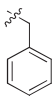
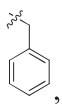
Y is , wherein ring A is a 5- or 6-membered ring containing 0, 1, 2 or 3 heteroatoms independently selected from N, O or S; and ring B is phenyl or C_{5-6} heteroaryl containing 0, 1, 2 or 3 heteroatoms each independently selected from N, O or S.

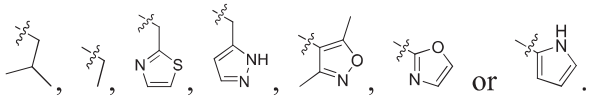
R_3 and R_4 are absent or are each independently selected from H, halogen, hydroxyl, amino, C_{1-6} alkyl, C_{1-6} alkoxy, cyano, oxo, or $-N(R_5)-SO_2-R_6$; and

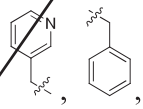
R_5 and R_6 are each independently selected from H, C_{1-6} alkyl or C_{1-6} halogenoalkyl.

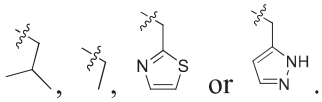
2. The compound according to claim 1, wherein R_1 is selected from H, C_{1-4} alkyl, phenyl or C_{5-6} heteroaryl, wherein the C_{1-4} alkyl, phenyl or C_{5-6} heteroaryl is optionally substituted by C_{1-6} alkyl, $-NH_2$, phenyl, or C_{5-6} heteroaryl.

3. The compound according to claim 1 or 2, wherein the heteroaryl has 1, 2 or 3 heteroatoms each independently selected from nitrogen or sulfur.

4. The compound according to any one of claims 1-3, wherein R_1 is H, $-CH_3$, , ,



5. The compound according to any one of claims 1-4, wherein R_1 is H, $-CH_3$, 



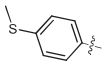
6. The compound according to any one of claims 1-5, wherein R_2 is H or C_{1-3} alkyl.

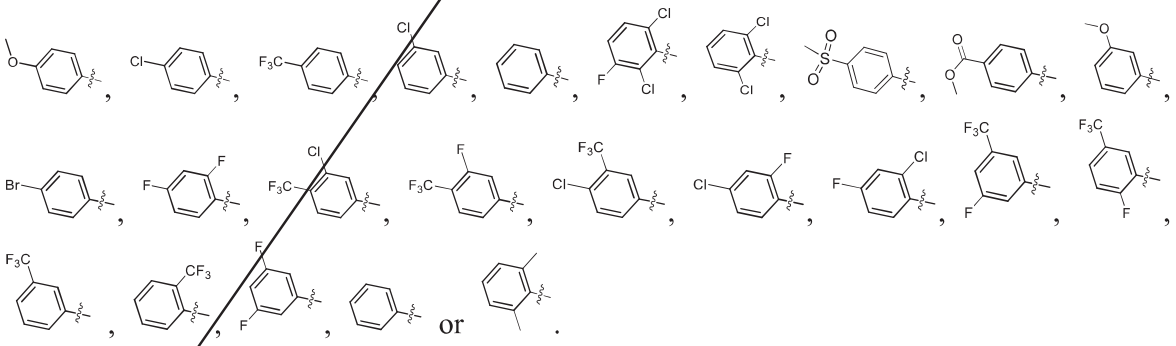
7. The compound according to any one of claims 1-6, wherein R_2 is H or $-CH_3$.

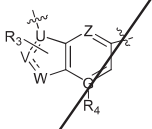
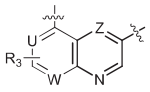
8. The compound according to any one of claims 1-7, wherein Q is absent or is selected from $-CH_2-$, , -NH- or $-SO_2-$.

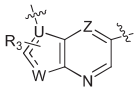
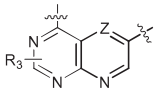
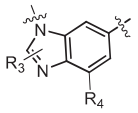
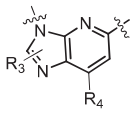
9. The compound according to any one of claims 1-8, wherein X is selected from H, C_{1-3} alkyl or phenyl, wherein the phenyl is unsubstituted or optionally substituted by halogen, halo C_{1-3} alkyl, C_{1-3} alkyl, C_{1-3} alkoxy, C_{1-3} alkylthio, C_{1-3} alkoxycarbonyl, or C_{1-3} alkyl-SO_2-.

10. The compound according to any one of claims 1-9, wherein X is selected from H, C_{1-3} alkyl or phenyl, wherein the phenyl is unsubstituted or optionally substituted by F, Cl, methyl, trifluoromethyl, methoxy, methylthio, methoxycarbonyl or methyl-SO_2-.

11. The compound according to any one of claims 1-10, wherein X is $-CH_3$, H, ,



12. The compound according to any one of claims 1-11, wherein Y is selected from  or ; wherein,  represents a single bond or a double bond, the U, V, W, G or Z is independently selected from C or N; when G is N, R_4 is absent; when G is C, R_4 is H or -N(R_5)-SO_2-R_6; wherein R_5 and R_6 are each independently selected from H, C_{1-6} alkyl or C_{1-6} halogenoalkyl.

13.The compound according to any one of claims 1-12, wherein Y is selected from , ,  or  ; wherein, ---- represents a single bond or a double bond, the U, W or Z is independently selected from C or N; R_3 is selected from H, halogen, hydroxyl, amino, C_{1-6} alkyl, C_{1-6} alkoxy, cyano or oxo; R_4 is H or $-N(R_5)-SO_2-R_6$; wherein R_5 and R_6 are each independently selected from H, C_{1-6} alkyl or C_{1-6} halogenoalkyl.

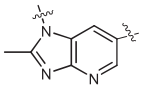
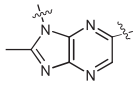
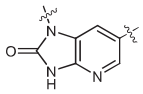
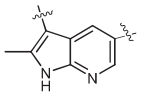
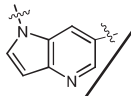
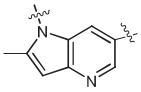
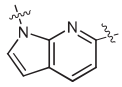
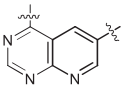
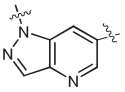
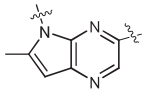
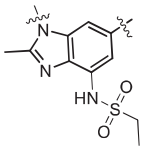
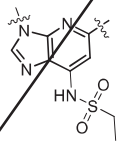
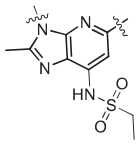
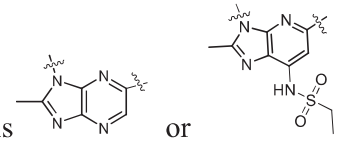
14.The compound according to any one of claims 1-13, wherein R_3 is H, C_{1-6} alkyl, C_{1-6} alkoxy, cyano or oxo.

15. The compound of any one of claims 1-14, wherein R_3 is H, methyl or oxo.

16. The compound of any one of claims 1-15, wherein R_4 is $-N(R_5)-SO_2-R_6$.

17.The compound of any one of claims 1-16, wherein R_5 and R_6 are independently selected from H or C_{1-6} alkyl.

18. The compound of any one of claims 1-17, wherein R_5 and R_6 are independently selected from H, methyl or ethyl.

19.The compound of any one of claims 1-18, wherein Y is , , , , , , , , , , , ,  or .

20.The compound of any one of claims 1-19, wherein Y is or .

21.A compound or a pharmaceutically acceptable salt thereof, wherein the compound is:

1) 4-(1-(4-chlorobenzyl)-2-methyl-1H-imidazo[4,5-b]pyridin-6-yl)-6-methyl-1H-pyrrolo[2,3-c]pyridin-7(6H)-one;

2) 4-(1-(4-methoxybenzyl)-2-methyl-1H-imidazo[4,5-b]pyridin-6-yl)-6-methyl-1H-pyrrolo[2,3-c]pyridin-7(6H)-one;

3) 6-methyl-4-(2-methyl-1-(4-(methylthio)benzyl)-1H-imidazo[4,5-b]pyridin-6-yl)-1H-pyrrolo[2,3-c]pyridin-7(6H)-one;

4) 6-methyl-4-(2-methyl-1-(4-(trifluoromethyl)benzyl)-1H-imidazo[4,5-b]pyridin-6-yl)-1H-pyrrolo[2,3-c]pyridin-7(6H)-one;

5) 4-(1-(3-chlorobenzyl)-2-methyl-1H-imidazo[4,5-b]pyridin-6-yl)-6-methyl-1H-pyrrolo[2,3-c]pyridin-7(6H)-one;

6) 4-(1-benzyl-2-methyl-1H-imidazo[4,5-b]pyridin-6-yl)-6-methyl-1H-pyrrolo[2,3-c]pyridin-7(6H)one;

7) 4-(1,2-dimethyl-1H-imidazo[4,5-b]pyridin-6-yl)-6-methyl-1,6-dihydro-7H-pyrrolo[2,3-c]pyridin-7-one;

8) 6-methyl-4-(2-methyl-1H-imidazo[4,5-b]pyridin-6-yl)-1,6-dihydro-7H-pyrrolo[2,3-c]pyridin-7-one;

9) Methyl 4-((2-methyl-6-(6-methyl-7-oxo-6,7-dihydro-1H-pyrrolo[2,3-c]pyridin-4-yl)-1H-imidazo[4,5-b]pyridin-1-yl)methyl)benzoate;

10) 6-benzyl-4-(1-(4-methoxybenzyl)-2-methyl-1H-imidazo[4,5-b]pyridin-6-yl)-1,6-dihydro-7H-pyrrolo[2,3-c]pyridin-7-one;

11) 6-isobutyl-4-(1-(4-methoxybenzyl)-2-methyl-1H-imidazo[4,5-b]pyridin-6-yl)-1,6-dihydro-7H-pyrrolo[2,3-c]pyridin-7-one;

12) 6-ethyl-4-(1-(4-methoxybenzyl)-2-methyl-1H-imidazo[4,5-b]pyridin-6-yl)-1,6-dihydro-7H-pyrrolo[2,3-c]pyridin-7-one;

13) 4-(1-(4-methoxybenzyl)-2-methyl-1H-imidazo[4,5-b]pyridin-6-yl)-2-methyl-1,6-dihydro-7H-pyrrolo[2,3-c]pyridin-7-one;

14) 4-(1-(4-methoxybenzyl)-2-methyl-1H-imidazo[4,5-b]pyridin-6-yl)-6-(thiazol-2-ylmethyl)-1,6-dihydro-7H-pyrrolo[2,3-c]pyridin-7-one;

15) 4-(1-(4-methoxybenzyl)-2-methyl-1H-imidazo[4,5-b]pyridin-6-yl)-6-(pyrazol-2-methyl)-1,6-dihydro-7H-pyrrolo[2,3-c]pyridin-7-one;

16) 4-(1-(3-methoxybenzyl)-2-methyl-1H-imidazo[4,5-b]pyridin-6-yl)-2-methyl-1,6-dihydro-7H-pyrrolo[2,3-c]pyridin-7-one;

17) 4-(1-(4-chlorobenzyl)-2-methyl-1H-imidazo[4,5-b]pyridin-6-yl)-6-(pyridin-3-ylmethyl)-1,6-dihydro-7H-pyrrolo[2,3-c]pyridin-7-one;

18) 4-(1-(4-chlorobenzyl)-2-methyl-1H-imidazo[4,5-b]pyrazin-6-yl)-6-methyl-1H-pyrrolo[

2,3-c]pyridin-7(6H)-one;

19) 6-methyl-4-(2-methyl-1-(4-(trifluoromethyl)benzyl)-1H-imidazo[4,5-b]pyrazin-6-yl)-1H-pyrrolo[2,3-c]pyridin-7(6H)-one;

20) 4-(1-(4-methoxybenzyl)-2-methyl-1H-imidazo[4,5-b]pyrazin-6-yl)-6-methyl-1H-pyrrolo[2,3-c]pyridin-7(6H)-one;

21) 4-(1-(1-(4-chlorophenyl)ethyl)-2-methyl-1H-imidazo[4,5-b]pyrazin-6-yl)-6-methyl-1,6-dihydro-7H-pyrrolo[2,3-c]pyridin-7-one;

22) 4-(1-benzyl-2-methyl-1H-imidazo[4,5-b]pyrazin-6-yl)-6-methyl-1H-pyrrolo[2,3-c]pyridin-7(6H)-one;

23) 4-(1-(3-trifluoromethylbenzyl)-2-methyl-1H-imidazo[4,5-b]pyrazin-6-yl)-6-methyl-1H-pyrrolo[2,3-c]pyridin-7(6H)-one;

24) 4-(1-(2-fluoro-5-trifluoromethylbenzyl)-2-methyl-1H-imidazo[4,5-b]pyrazin-6-yl)-6-methyl-1H-pyrrolo[2,3-c]pyridin-7(6H)-one;

25) 4-(1-(3-fluoro-5-trifluoromethylbenzyl)-2-methyl-1H-imidazo[4,5-b]pyrazin-6-yl)-6-methyl-1H-pyrrolo[2,3-c]pyridin-7(6H)-one;

26) 4-(1-(2-fluoro-4-chlorobenzyl)-2-methyl-1H-imidazo[4,5-b]pyrazin-6-yl)-6-methyl-1H-pyrrolo[2,3-c]pyridin-7(6H)-one;

27) 4-(1-(3-trifluoromethyl-4-chlorobenzyl)-2-methyl-1H-imidazo[4,5-b]pyrazin-6-yl)-6-methyl-1H-pyrrolo[2,3-c]pyridin-7(6H)-one;

28) 4-(1-(3-fluoro-4-trifluoromethylbenzyl)-2-methyl-1H-imidazo[4,5-b]pyrazin-6-yl)-6-methyl-1H-pyrrolo[2,3-c]pyridin-7(6H)-one;

29) 4-(1-(3-chloro-4-trifluoromethylbenzyl)-2-methyl-1H-imidazo[4,5-b]pyrazin-6-yl)-6-methyl-1H-pyrrolo[2,3-c]pyridin-7(6H)-one;

30) 4-(1-(3-chlorobenzyl)-2-methyl-1H-imidazo[4,5-b]pyrazin-6-yl)-6-methyl-1H-pyrrolo[2,3-c]pyridin-7(6H)-one;

31) 4-(1-(2,4-difluorobenzyl)-2-methyl-1H-imidazo[4,5-b]pyrazin-6-yl)-6-methyl-1H-pyrrolo[2,3-c]pyridin-7(6H)-one;

32) 4-(1-(4-bromobenzyl)-2-methyl-1H-imidazo[4,5-b]pyrazin-6-yl)-6-methyl-1H-pyrrolo[2,3-c]pyridin-7(6H)-one;

33) 6-methyl-4-(2-methyl-1-(4-(methylsulfonyl)benzyl)-1H-imidazo[4,5-b]pyrazin-6-yl)-1

H-pyrrolo[2,3-c]pyridin-7(6H)-one;

34) 1-(4-chlorobenzyl)-6-(6-methyl-7-oxo-6,7-dihydro-1H-pyrrolo[2,3-c]pyridin-4-yl)-1,3-dihydro-2H-imidazo[4,5-b]pyridin-2-one;

35) 4-(3-(1-(2,6-dichloro-3-fluorophenyl)ethyl)-2-methyl-1H-pyrrolo[2,3-b]pyridin-5-yl)-6-methyl-1,6-dihydro-7H-pyrrolo[2,3-c]pyridin-7-one;

36) 4-(1-(2,6-dichlorobenzyl)-1H-pyrrolo[3,2-b]pyridin-6-yl)-6-methyl-1,6-dihydro-7H-pyrrolo[2,3-c]pyridin-7-one;

37) 4-(4-((4-chlorophenyl)amino)pyrido[2,3-d]pyrimidin-6-yl)-6-methyl-1,6-dihydro-7H-pyrrolo[2,3-c]pyridin-7-one;

38) 4-(1-(2,6-dichlorobenzyl)-2-methyl-1H-pyrrolo[3,2-b]pyridin-6-yl)-6-methyl-1,6-dihydro-7H-pyrrolo[2,3-c]pyridin-7-one;

39) 4-(1-(4-chlorobenzyl)-1H-pyrazolo[4,3-b]pyridin-6-yl)-6-methyl-1,6-dihydro-7H-pyrrolo[2,3-c]pyridin-7-one;

40) 4-(1-((4-chlorophenyl)sulfonyl)-1H-pyrrolo[2,3-b]pyridin-6-yl)-6-methyl-1,6-dihydro-7H-pyrrolo[2,3-c]pyridin-7-one;

41) N-(1-(4-chlorobenzyl)-2-methyl-6-(6-methyl-7-oxo-6,7-dihydro-1H-pyrrolo[2,3-c]pyridin-4-yl)-1H-benzo[d]imidazol-4-yl)ethanesulfonamide;

42) N-(2-methyl-6-(6-methyl-7-oxo-6,7-dihydro-1H-pyrrolo[2,3-c]pyridin-4-yl)-1-(4-(trifluoromethyl)benzyl)-1H-benzo[d]imidazol-4-yl)ethanesulfonamide;

43) N-(1-(4-methoxybenzyl)-2-methyl-6-(6-methyl-7-oxo-6,7-dihydro-1H-pyrrolo[2,3-c]pyridin-4-yl)-1H-benzo[d]imidazol-4-yl)ethanesulfonamide;

44) N-(1-(1-(4-chlorophenyl)ethyl)-2-methyl-6-(6-methyl-7-oxo-6,7-dihydro-1H-pyrrolo[2,3-c]pyridin-4-yl)-1H-benzo[d]imidazol-4-yl)ethanesulfonamide;

45) N-(1-benzyl-2-methyl-6-(6-methyl-7-oxo-6,7-dihydro-1H-pyrrolo[2,3-c]pyridin-4-yl)-1H-benzo[d]imidazol-4-yl)ethanesulfonamide;

46) N-(2-methyl-6-(6-methyl-7-oxo-6,7-dihydro-1H-pyrrolo[2,3-c]pyridin-4-yl)-1-(3-(trifluoromethyl)benzyl)-1H-benzo[d]imidazol-4-yl)ethanesulfonamide;

47) N-(2-methyl-6-(6-methyl-7-oxo-6,7-dihydro-1H-pyrrolo[2,3-c]pyridin-4-yl)-1-(2-fluoro-5-(trifluoromethyl)benzyl)-1H-benzo[d]imidazol-4-yl)ethanesulfonamide;

48) N-(2-methyl-6-(6-methyl-7-oxo-6,7-dihydro-1H-pyrrolo[2,3-c]pyridin-4-yl)-1-(3-fluoro

-5-(trifluoromethyl)benzyl)-1H-benzo[d]imidazol-4-yl)ethanesulfonamide;

49) N-(2-methyl-6-(6-methyl-7-oxo-6,7-dihydro-1H-pyrrolo[2,3-c]pyridin-4-yl)-1-(2-fluoro-4-chlorobenzyl)-1H-benzo[d]imidazol-4-yl)ethanesulfonamide;

50) N-(2-methyl-6-(6-methyl-7-oxo-6,7-dihydro-1H-pyrrolo[2,3-c]pyridin-4-yl)-1-(3-(trifluoromethyl)-4chlorobenzyl)-1H-benzo[d]imidazol-4-yl)ethanesulfonamide;

51) N-(2-methyl-6-(6-methyl-7-oxo-6,7-dihydro-1H-pyrrolo[2,3-c]pyridin-4-yl)-1-(3-fluoro-4-(trifluoromethyl)benzyl)-1H-benzo[d]imidazol-4-yl)ethanesulfonamide;

52) N-(2-methyl-6-(6-methyl-7-oxo-6,7-dihydro-1H-pyrrolo[2,3-c]pyridin-4-yl)-1-(3-chloro-4-(trifluoromethyl)benzyl)-1H-benzo[d]imidazol-4-yl)ethanesulfonamide;

53) N-(2-methyl-6-(6-methyl-7-oxo-6,7-dihydro-1H-pyrrolo[2,3-c]pyridin-4-yl)-1-(3-chlorobenzyl)-1H-benzo[d]imidazol-4-yl)ethanesulfonamide;

54) N-(2-methyl-6-(6-methyl-7-oxo-6,7-dihydro-1H-pyrrolo[2,3-c]pyridin-4-yl)-1-(2,4-difluorobenzyl)-1H-benzo[d]imidazol-4-yl)ethanesulfonamide;

55) N-(2-methyl-6-(6-methyl-7-oxo-6,7-dihydro-1H-pyrrolo[2,3-c]pyridin-4-yl)-1-(4-bromobenzyl)-1H-benzo[d]imidazol-4-yl)ethanesulfonamide;

56) N-(2-methyl-6-(6-methyl-7-oxo-6,7-dihydro-1H-pyrrolo[2,3-c]pyridin-4-yl)-1-(4-(methylsulfonyl)benzyl)-1H-benzo[d]imidazol-4-yl)ethanesulfonamide;

57) N-(1-(2-chloro-4-fluorobenzyl)-2-methyl-6-(6-methyl-7-oxo-6,7-dihydro-1H-pyrrolo[2,3-c]pyridin-4-yl)-1H-benzo[d]imidazol-4-yl)ethanesulfonamide;

58) N-(5-(6-methyl-7-oxo-6,7-dihydro-1H-pyrrolo[2,3-c]pyridin-4-yl)-3-(4-(trifluoromethyl)benzyl)-3H-imidazo[4,5-b]pyridin-7-yl)ethanesulfonamide;

59) N-(3-(2,4-difluorobenzyl)-5-(6-methyl-7-oxo-6,7-dihydro-1H-pyrrolo[2,3-c]pyridin-4-yl)-3H-imidazo[4,5-b]pyridin-7-yl)ethanesulfonamide;

60) N-(3-(1-(4-chlorophenyl)ethyl)-5-(6-methyl-7-oxo-6,7-dihydro-1H-pyrrolo[2,3-c]pyridin-4-yl)-3H-imidazo[4,5-b]pyridin-7-yl)ethanesulfonamide;

61) N-(3-(2-fluoro-5-(trifluoromethyl)benzyl)-5-(6-methyl-7-oxo-6,7-dihydro-1H-pyrrolo[2,3-c]pyridin-4-yl)-3H-imidazo[4,5-b]pyridin-7-yl)ethanesulfonamide;

62) N-(3-(3,5-difluorobenzyl)-5-(6-methyl-7-oxo-6,7-dihydro-1H-pyrrolo[2,3-c]pyridin-4-yl)-3H-imidazo[4,5-b]pyridin-7-yl)ethanesulfonamide;

63) N-(5-(6-methyl-7-oxo-6,7-dihydro-1H-pyrrolo[2,3-c]pyridin-4-yl)-3-(2-(trifluoromethyl

)benzyl)-3H-imidazo[4,5-b]pyridin-7-yl)ethanesulfonamide;

64) N-(3-(2,4-difluorobenzyl)-2-methyl-5-(6-methyl-7-oxo-6,7-dihydro-1H-pyrrolo[2,3-c]pyridin-4-yl)-3H-imidazo[4,5-b]pyridin-7-yl)ethanesulfonamide;

65) N-(2-methyl-5-(6-methyl-7-oxo-6,7-dihydro-1H-pyrrolo[2,3-c]pyridin-4-yl)-3-(4-(trifluoromethyl)benzyl)-3H-imidazo[4,5-b]pyridin-7-yl)ethanesulfonamide;

66) N-(2-methyl-5-(6-methyl-7-oxo-6,7-dihydro-1H-pyrrolo[2,3-c]pyridin-4-yl)-3-(2-(trifluoromethyl)benzyl)-3H-imidazo[4,5-b]pyridin-7-yl)ethanesulfonamide;

67) N-(3-(3,5-difluorobenzyl)-2-methyl-5-(6-methyl-7-oxo-6,7-dihydro-1H-pyrrolo[2,3-c]pyridin-4-yl)-3H-imidazo[4,5-b]pyridin-7-yl)ethanesulfonamide; or

68) N-(3-(2,6-dimethylbenzyl)-2-methyl-5-(6-methyl-7-oxo-6,7-dihydro-1H-pyrrolo[2,3-c]pyridin-4-yl)-3H-imidazo[4,5-b]pyridin-7-yl)ethanesulfonamide.

22. A crystalline form of 6-methyl-4-(2-methyl-1-(4-(trifluoromethyl)benzyl)-1H-imidazo[4,5-b]pyrazin-6-yl)-1H-pyrrolo[2,3-c]pyridin-7(6H)-one, characterized in that its X-ray powder diffraction pattern has characteristic peaks at 2θ values of 13.8±0.2°, 18.9±0.2°, 26.0±0.2°.

23.The crystalline form according to claim 22, wherein the X-ray powder diffraction pattern of the crystalline form has characteristic peaks at 2θ values of 6.2±0.2°, 13.8±0.2°, 18.9±0.2°, 19.5±0.2°, 26.0±0.2°, 26.8±0.2°.

24.The crystalline form according to claim 22 or 23, wherein the crystalline form is anhydrous.

25. A pharmaceutical composition comprising a therapeutically effective amount of the compound according to any one of claims 1-21 and/or the crystalline form according to any one of claims 22-24 and a pharmaceutical acceptable excipient.

26. The pharmaceutical composition of claim 25, wherein a weight ratio of the said compound to the said excipient is in the range from about 0.001 to about 10.

27. Use of the pharmaceutical composition of claim 25 or 26 or the compound of any one of claims 1-21 and/or the crystalline form of any one of claims 22-24 in the preparation of a medicament.

28. The use according to claim 27, characterized in that the medicament is used for the treatment or prevention of cancer, autoimmune diseases, inflammatory diseases,

neurodegenerative diseases, cardiovascular disorders, renal disorders, viral infections and/or obesity.

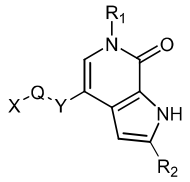
29. The use according to claim 28, wherein the cancer is selected from B acute lymphoblastic leukemia, Burkitt's lymphoma, diffuse large B-cell lymphoma, chronic lymphocytic leukemia, Hodgkin's lymphoma, follicular lymphoma, primary plasma cell leukemia, large cell neuroendocrine carcinoma, colon cancer, rectal cancer, mantle cell lymphoma, multiple myeloma, breast cancer, prostate cancer, glioblastoma tumor, squamous cell esophageal cancer, liposarcoma, melanoma, pancreatic cancer, brain cancer, or lung cancer.

30. The use according to claim 27, wherein the drug is used as a BET inhibitor.

31. The use according to claim 30, wherein the drug is used as a BRD4 inhibitor.

CLAIMS

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



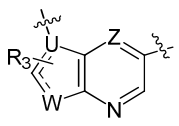
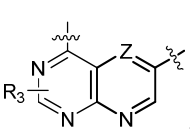
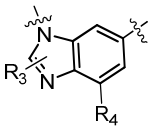
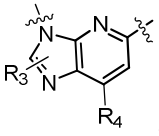
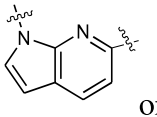
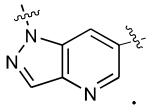
Formula (I)

wherein,

R_1 and R_2 are each independently selected from H, C_{1-6} alkyl, C_{1-6} alkoxy, C_{6-10} aryl or C_{5-10} heteroaryl, wherein the C_{1-6} alkyl, C_{1-6} alkoxy, C_{6-10} aryl or C_{5-10} heteroaryl is optionally substituted by C_{1-6} alkyl, $-NH_2$, -OH, C_{6-10} aryl or C_{5-10} heteroaryl; and the C_{5-10} heteroaryl has 1, 2, or 3 heteroatoms independently selected from nitrogen, oxygen or sulfur;

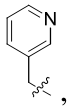
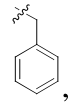
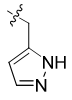
Q is absent or selected from C_{1-6} alkylene, $-SO_2-$ or -NH-, wherein the C_{1-6} alkylene or -NH- is optionally substituted by halogen, C_{1-6} alkyl or C_{1-6} alkoxy;

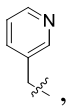
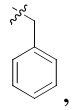
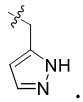
X is selected from H, C_{1-6} alkyl, C_{6-10} aryl or C_{5-10} heteroaryl, wherein the C_{1-6} alkyl, C_{6-10} aryl or C_{5-10} heteroaryl is optionally substituted by halogen, halo C_{1-6} alkyl, C_{1-6} alkyl, C_{1-6} alkoxy, C_{1-6} alkylthio, C_{1-6} alkoxycarbonyl or C_{1-6} alkyl-SO_2-;

Y is selected from , , , ,  or ; wherein, ⎓ represents a single bond or a double bond, the U, W or Z is independently selected from C or N; R_3 is selected from H, halogen, hydroxyl, amino, C_{1-6} alkyl, C_{1-6} alkoxy, cyano or oxo; R_4 is H or $-N(R_5)-SO_2-R_6$; wherein R_5 and R_6 are each independently selected from H, C_{1-6} alkyl or C_{1-6} halogenoalkyl.

2. The compound according to claim 1, wherein R_1 is selected from H, C_{1-4} alkyl, phenyl or C_{5-6} heteroaryl, wherein the C_{1-4} alkyl, phenyl or C_{5-6} heteroaryl is optionally substituted by C_{1-6} alkyl, $-NH_2$, phenyl, or C_{5-6} heteroaryl.

3. The compound according to claim 1, wherein the heteroaryl has 1, 2 or 3 heteroatoms each independently selected from nitrogen or sulfur.

4. The compound according to claim 1, wherein R_1 is H, -CH_3, , , , , , , ,  or .

5. The compound according to claim 1, wherein R_1 is H, -CH_3, , , , ,  or .

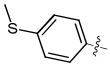
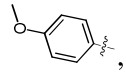
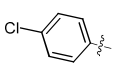
6. The compound according to claim 1, wherein R_2 is H or $C_{1\text{-}3}$ alkyl.

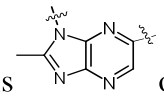
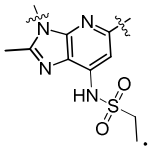
7. The compound according to claim 1, wherein R_2 is H or -CH_3.

8. The compound according to claim 1, wherein Q is absent or is selected from -CH_2-, , -NH- or -SO_2-.

9. The compound according to claim 1, wherein X is selected from H, $C_{1\text{-}3}$ alkyl or phenyl, wherein the phenyl is unsubstituted or optionally substituted by halogen, halo $C_{1\text{-}3}$ alkyl, $C_{1\text{-}3}$ alkyl, $C_{1\text{-}3}$ alkoxy, $C_{1\text{-}3}$ alkylthio, $C_{1\text{-}3}$ alkoxycarbonyl, or $C_{1\text{-}3}$ alkyl-SO_2-.

10. The compound according to claim 1, wherein X is selected from H, $C_{1\text{-}3}$ alkyl or phenyl, wherein the phenyl is unsubstituted or optionally substituted by F, Cl, methyl, trifluoromethyl, methoxy, methylthio, methoxycarbonyl or methyl-SO_2-.

11. The compound according to claim 1, wherein X is -CH_3, H, , , 

18. The compound of claim 1, wherein Y is  or .

19. A compound or a pharmaceutically acceptable salt thereof, wherein the compound is:

1) 4-(1-(4-chlorobenzyl)-2-methyl-1H-imidazo[4,5-b]pyridin-6-yl)-6-methyl-1H-pyrrolo[2,3-c]pyridin-7(6H)-one;

2) 4-(1-(4-methoxybenzyl)-2-methyl-1H-imidazo[4,5-b]pyridin-6-yl)-6-methyl-1H-pyrrolo[2,3-c]pyridin-7(6H)-one;

3) 6-methyl-4-(2-methyl-1-(4-(methylthio)benzyl)-1H-imidazo[4,5-b]pyridin-6-yl)-1H-pyrrolo[2,3-c]pyridin-7(6H)-one;

4) 6-methyl-4-(2-methyl-1-(4-(trifluoromethyl)benzyl)-1H-imidazo[4,5-b]pyridin-6-yl)-1H-pyrrolo[2,3-c]pyridin-7(6H)-one;

5) 4-(1-(3-chlorobenzyl)-2-methyl-1H-imidazo[4,5-b]pyridin-6-yl)-6-methyl-1H-pyrrolo[2,3-c]pyridin-7(6H)-one;

6) 4-(1-benzyl-2-methyl-1H-imidazo[4,5-b]pyridin-6-yl)-6-methyl-1H-pyrrolo[2,3-c]pyridin-7(6H)one;

7) 4-(1,2-dimethyl-1H-imidazo[4,5-b]pyridin-6-yl)-6-methyl-1,6-dihydro-7H-pyrrolo[2,3-c]pyridin-7-one;

8) 6-methyl-4-(2-methyl-1H-imidazo[4,5-b]pyridin-6-yl)-1,6-dihydro-7H-pyrrolo[2,3-c]pyridin-7-one;

9) Methyl 4-((2-methyl-6-(6-methyl-7-oxo-6,7-dihydro-1H-pyrrolo[2,3-c]pyridin-4-yl)-1H-imidazo[4,5-b]pyridin-1-yl)methyl)benzoate;

10) 6-benzyl-4-(1-(4-methoxybenzyl)-2-methyl-1H-imidazo[4,5-b]pyridin-6-yl)-1,6-dihydro-7H-pyrrolo[2,3-c]pyridin-7-one;

11) 6-isobutyl-4-(1-(4-methoxybenzyl)-2-methyl-1H-imidazo[4,5-b]pyridin-6-yl)-1,6-dihydro-7H-pyrrolo[2,3-c]pyridin-7-one;

12) 6-ethyl-4-(1-(4-methoxybenzyl)-2-methyl-1H-imidazo[4,5-b]pyridin-6-yl)-1,6-dihydro-7H-pyrrolo[2,3-c]pyridin-7-one;

13) 4-(1-(4-methoxybenzyl)-2-methyl-1H-imidazo[4,5-b]pyridin-6-yl)-2-methyl-1,6-dihydro-7H-pyrrolo[2,3-c]pyridin-7-one;

14) 4-(1-(4-methoxybenzyl)-2-methyl-1H-imidazo[4,5-b]pyridin-6-yl)-6-(thiazol-2-methyl)-1,6-dihydro-7H-pyrrolo[2,3-c]pyridin-7-one;

15) 4-(1-(4-methoxybenzyl)-2-methyl-1H-imidazo[4,5-b]pyridin-6-yl)-6-(pyrazol-2-methyl)-1,6-dihydro-7H-pyrrolo[2,3-c]pyridin-7-one;

16) 4-(1-(3-methoxybenzyl)-2-methyl-1H-imidazo[4,5-b]pyridin-6-yl)-2-methyl-1,6-dihydro-7H-pyrrolo[2,3-c]pyridin-7-one;

17) 4-(1-(4-chlorobenzyl)-2-methyl-1H-imidazo[4,5-b]pyridin-6-yl)-6-(pyridin-3-methyl)-1,6-dihydro-7H-pyrrolo[2,3-c]pyridin-7-one;

18) 4-(1-(4-chlorobenzyl)-2-methyl-1H-imidazo[4,5-b]pyrazin-6-yl)-6-methyl-1H-pyrrolo[2,3-c]pyridin-7(6H)-one;

19) 6-methyl-4-(2-methyl-1-(4-(trifluoromethyl)benzyl)-1H-imidazo[4,5-b]pyrazin-6-yl)-1H-pyrrolo[2,3-c]pyridin-7(6H)-one;

20) 4-(1-(4-methoxybenzyl)-2-methyl-1H-imidazo[4,5-b]pyrazin-6-yl)-6-methyl-1H-pyrrolo[2,3-c]pyridin-7(6H)-one;

21) 4-(1-(1-(4-chlorophenyl)ethyl)-2-methyl-1H-imidazo[4,5-b]pyrazin-6-yl)-6-methyl-1,6-dihydro-7H-pyrrolo[2,3-c]pyridin-7-one;

22) 4-(1-benzyl-2-methyl-1H-imidazo[4,5-b]pyrazin-6-yl)-6-methyl-1H-pyrrolo[2,3-c]pyridin-7(6H)-one;

23) 4-(1-(3-trifluoromethylbenzyl)-2-methyl-1H-imidazo[4,5-b]pyrazin-6-yl)-6-methyl-1H-pyrrolo[2,3-c]pyridin-7(6H)-one;

24) 4-(1-(2-fluoro-5-trifluoromethylbenzyl)-2-methyl-1H-imidazo[4,5-b]pyrazin-6-yl)-6-methyl-1H-pyrrolo[2,3-c]pyridin-7(6H)-one;

25) 4-(1-(3-fluoro-5-trifluoromethylbenzyl)-2-methyl-1H-imidazo[4,5-b]pyrazin-6-yl)-6-methyl-1H-pyrrolo[2,3-c]pyridin-7(6H)-one;

26) 4-(1-(2-fluoro-4-chlorobenzyl)-2-methyl-1H-imidazo[4,5-b]pyrazin-6-yl)-6-methyl-1H-pyrrolo[2,3-c]pyridin-7(6H)-one;

27) 4-(1-(3-trifluoromethyl-4-chlorobenzyl)-2-methyl-1H-imidazo[4,5-b]pyrazin-6-yl)-6-methyl-1H-pyrrolo[2,3-c]pyridin-7(6H)-one;

28) 4-(1-(3-fluoro-4-trifluoromethylbenzyl)-2-methyl-1H-imidazo[4,5-b]pyrazin-6-yl)-6-methyl-1H-pyrrolo[2,3-c]pyridin-7(6H)-one;

29) 4-(1-(3-chloro-4-trifluoromethylbenzyl)-2-methyl-1H-imidazo[4,5-b]pyrazin-6-yl)-6-

methyl-1H-pyrrolo[2,3-c]pyridin-7(6H)-one;

30) 4-(1-(3-chlorobenzyl)-2-methyl-1H-imidazo[4,5-b]pyrazin-6-yl)-6-methyl-1H-pyrrolo[2,3-c]pyridin-7(6H)-one;

31) 4-(1-(2,4-difluorobenzyl)-2-methyl-1H-imidazo[4,5-b]pyrazin-6-yl)-6-methyl-1H-pyrrolo[2,3-c]pyridin-7(6H)-one;

32) 4-(1-(4-bromobenzyl)-2-methyl-1H-imidazo[4,5-b]pyrazin-6-yl)-6-methyl-1H-pyrrolo[2,3-c]pyridin-7(6H)-one;

33) 6-methyl-4-(2-methyl-1-(4-(methylsulfonyl)benzyl)-1H-imidazo[4,5-b]pyrazin-6-yl)-1H-pyrrolo[2,3-c]pyridin-7(6H)-one;

34) 1-(4-chlorobenzyl)-6-(6-methyl-7-oxo-6,7-dihydro-1H-pyrrolo[2,3-c]pyridin-4-yl)-1,3-dihydro-2H-imidazo[4,5-b]pyridin-2-one;

35) 4-(3-(1-(2,6-dichloro-3-fluorophenyl)ethyl)-2-methyl-1H-pyrrolo[2,3-b]pyridin-5-yl)-6-methyl-1,6-dihydro-7H-pyrrolo[2,3-c]pyridin-7-one;

36) 4-(1-(2,6-dichlorobenzyl)-1H-pyrrolo[3,2-b]pyridin-6-yl)-6-methyl-1,6-dihydro-7H-pyrrolo[2,3-c]pyridin-7-one;

37) 4-(4-((4-chlorophenyl)amino)pyrido[2,3-d]pyrimidin-6-yl)-6-methyl-1,6-dihydro-7H-pyrrolo[2,3-c]pyridin-7-one;

38) 4-(1-(2,6-dichlorobenzyl)-2-methyl-1H-pyrrolo[3,2-b]pyridin-6-yl)-6-methyl-1,6-dihydro-7H-pyrrolo[2,3-c]pyridin-7-one;

39) 4-(1-(4-chlorobenzyl)-1H-pyrazolo[4,3-b]pyridin-6-yl)-6-methyl-1,6-dihydro-7H-pyrrolo[2,3-c]pyridin-7-one;

40) 4-(1-((4-chlorophenyl)sulfonyl)-1H-pyrrolo[2,3-b]pyridin-6-yl)-6-methyl-1,6-dihydro-7H-pyrrolo[2,3-c]pyridin-7-one;

41) N-(1-(4-chlorobenzyl)-2-methyl-6-(6-methyl-7-oxo-6,7-dihydro-1H-pyrrolo[2,3-c]pyridin-4-yl)-1H-benzo[d]imidazol-4-yl)ethanesulfonamide;

42) N-(2-methyl-6-(6-methyl-7-oxo-6,7-dihydro-1H-pyrrolo[2,3-c]pyridin-4-yl)-1-(4-(trifluoromethyl)benzyl)-1H-benzo[d]imidazol-4-yl)ethanesulfonamide;

43) N-(1-(4-methoxybenzyl)-2-methyl-6-(6-methyl-7-oxo-6,7-dihydro-1H-pyrrolo[2,3-c]pyridin-4-yl)-1H-benzo[d]imidazol-4-yl)ethanesulfonamide;

44) N-(1-(1-(4-chlorophenyl)ethyl)-2-methyl-6-(6-methyl-7-oxo-6,7-dihydro-1H-pyrrolo[2,3-c]pyridin-4-yl)-1H-benzo[d]imidazol-4-yl)ethanesulfonamide;

45) N-(1-benzyl-2-methyl-6-(6-methyl-7-oxo-6,7-dihydro-1H-pyrrolo[2,3-c]pyridin-4-yl)-1H-benzo[d]imidazol-4-yl)ethanesulfonamide;

46) N-(2-methyl-6-(6-methyl-7-oxo-6,7-dihydro-1H-pyrrolo[2,3-c]pyridin-4-yl)-1-(3-(trifluoromethyl)benzyl)-1H-benzo[d]imidazol-4-yl)ethanesulfonamide;

47) N-(2-methyl-6-(6-methyl-7-oxo-6,7-dihydro-1H-pyrrolo[2,3-c]pyridin-4-yl)-1-(2-fluoro-5-(trifluoromethyl)benzyl)-1H-benzo[d]imidazol-4-yl)ethanesulfonamide;

48) N-(2-methyl-6-(6-methyl-7-oxo-6,7-dihydro-1H-pyrrolo[2,3-c]pyridin-4-yl)-1-(3-fluoro-5-(trifluoromethyl)benzyl)-1H-benzo[d]imidazol-4-yl)ethanesulfonamide;

49) N-(2-methyl-6-(6-methyl-7-oxo-6,7-dihydro-1H-pyrrolo[2,3-c]pyridin-4-yl)-1-(2-fluoro-4-chlorobenzyl)-1H-benzo[d]imidazol-4-yl)ethanesulfonamide;

50) N-(2-methyl-6-(6-methyl-7-oxo-6,7-dihydro-1H-pyrrolo[2,3-c]pyridin-4-yl)-1-(3-(trifluoromethyl)-4chlorobenzyl)-1H-benzo[d]imidazol-4-yl)ethanesulfonamide;

51) N-(2-methyl-6-(6-methyl-7-oxo-6,7-dihydro-1H-pyrrolo[2,3-c]pyridin-4-yl)-1-(3-fluoro-4-(trifluoromethyl)benzyl)-1H-benzo[d]imidazol-4-yl)ethanesulfonamide;

52) N-(2-methyl-6-(6-methyl-7-oxo-6,7-dihydro-1H-pyrrolo[2,3-c]pyridin-4-yl)-1-(3-chloro-4-(trifluoromethyl)benzyl)-1H-benzo[d]imidazol-4-yl)ethanesulfonamide;

53) N-(2-methyl-6-(6-methyl-7-oxo-6,7-dihydro-1H-pyrrolo[2,3-c]pyridin-4-yl)-1-(3-chlorobenzyl)-1H-benzo[d]imidazol-4-yl)ethanesulfonamide;

54) N-(2-methyl-6-(6-methyl-7-oxo-6,7-dihydro-1H-pyrrolo[2,3-c]pyridin-4-yl)-1-(2,4-difluorobenzyl)-1H-benzo[d]imidazol-4-yl)ethanesulfonamide;

55) N-(2-methyl-6-(6-methyl-7-oxo-6,7-dihydro-1H-pyrrolo[2,3-c]pyridin-4-yl)-1-(4-bromobenzyl)-1H-benzo[d]imidazol-4-yl)ethanesulfonamide;

56) N-(2-methyl-6-(6-methyl-7-oxo-6,7-dihydro-1H-pyrrolo[2,3-c]pyridin-4-yl)-1-(4-(methylsulfonyl)benzyl)-1H-benzo[d]imidazol-4-yl)ethanesulfonamide;

57) N-(1-(2-chloro-4-fluorobenzyl)-2-methyl-6-(6-methyl-7-oxo-6,7-dihydro-1H-pyrrolo[2,3-c]pyridin-4-yl) -1H-benzo[d]imidazol-4-yl)ethanesulfonamide;

58) N-(5-(6-methyl-7-oxo-6,7-dihydro-1H-pyrrolo[2,3-c]pyridin-4-yl)-3-(4-(trifluoromethyl)benzyl)-3H-imidazo[4,5-b]pyridin-7-yl)ethanesulfonamide;

59) N-(3-(2,4-difluorobenzyl)-5-(6-methyl-7-oxo-6,7-dihydro-1H-pyrrolo[2,3-c]pyridin-4-yl)-3H-imidazo[4,5-b]pyridin-7-yl)ethanesulfonamide;

60) N-(3-(1-(4-chlorophenyl)ethyl)-5-(6-methyl-7-oxo-6,7-dihydro-1H-pyrrolo[2,3-

c]pyridin-4-yl)-3H-imidazo[4,5-b]pyridin-7-yl)ethanesulfonamide;

61) N-(3-(2-fluoro-5-(trifluoromethyl)benzyl)-5-(6-methyl-7-oxo-6,7-dihydro-1H-pyrrolo[2,3-c]pyridin-4-yl)-3H-imidazo[4,5-b]pyridin-7-yl)ethanesulfonamide;

62) N-(3-(3,5-difluorobenzyl)-5-(6-methyl-7-oxo-6,7-dihydro-1H-pyrrolo[2,3-c]pyridin-4-yl)-3H-imidazo[4,5-b]pyridin-7-yl)ethanesulfonamide;

63) N-(5-(6-methyl-7-oxo-6,7-dihydro-1H-pyrrolo[2,3-c]pyridin-4-yl)-3-(2-(trifluoromethyl)benzyl)-3H-imidazo[4,5-b]pyridin-7-yl)ethanesulfonamide;

64) N-(3-(2,4-difluorobenzyl)-2-methyl-5-(6-methyl-7-oxo-6,7-dihydro-1H-pyrrolo[2,3-c]pyridin-4-yl)-3H-imidazo[4,5-b]pyridin-7-yl)ethanesulfonamide;

65) N-(2-methyl-5-(6-methyl-7-oxo-6,7-dihydro-1H-pyrrolo[2,3-c]pyridin-4-yl)-3-(4-(trifluoromethyl)benzyl)-3H-imidazo[4,5-b]pyridin-7-yl)ethanesulfonamide;

66) N-(2-methyl-5-(6-methyl-7-oxo-6,7-dihydro-1H-pyrrolo[2,3-c]pyridin-4-yl)-3-(2-(trifluoromethyl)benzyl)-3H-imidazo[4,5-b]pyridin-7-yl)ethanesulfonamide;

67) N-(3-(3,5-difluorobenzyl)-2-methyl-5-(6-methyl-7-oxo-6,7-dihydro-1H-pyrrolo[2,3-c]pyridin-4-yl)-3H-imidazo[4,5-b]pyridin-7-yl)ethanesulfonamide; or

68) N-(3-(2,6-dimethylbenzyl)-2-methyl-5-(6-methyl-7-oxo-6,7-dihydro-1H-pyrrolo[2,3-c]pyridin-4-yl)-3H-imidazo[4,5-b]pyridin-7-yl)ethanesulfonamide.

20. Use of the compound of claim 1 in the manufacture of a medicament for treating a BET-mediated disease in a subject, wherein the BET-mediated disease is selected from the group consisting of B acute lymphoblastic leukemia, Burkitt's lymphoma, diffuse large B-cell lymphoma, chronic lymphocytic leukemia, Hodgkin's lymphoma, follicular lymphoma, primary plasma cell leukemia, large cell neuroendocrine carcinoma, colon cancer, rectal cancer, mantle cell lymphoma, multiple myeloma, breast cancer, prostate cancer, glioblastoma tumor, squamous cell esophageal cancer, liposarcoma, melanoma, pancreatic cancer, brain cancer, and lung cancer.

21. The use according to claim 20, wherein the BET includes BRD4.

22. The use according to claim 20, wherein the subject is human.