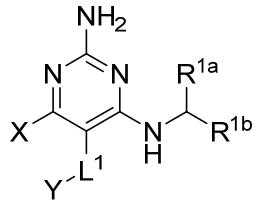
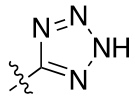
We claim:

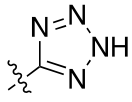
1. A compound having the structure of Formula (1), or a pharmaceutically acceptable salt thereof,



(1)

wherein

R^{1a} is selected from the group consisting of H, C_1-C_4 alkyl, $-NH_2$, -NHAc, -COOH, $-SO_2CH_3$, $-SCH_3$, $-OCH_3$,  ; and A,

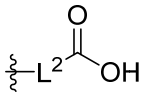
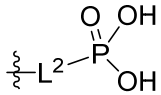
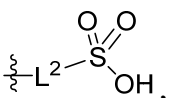
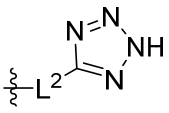
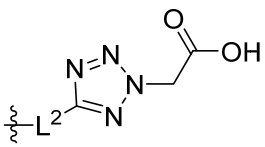
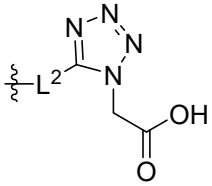
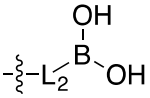
wherein the alkyl is optionally substituted with -OH, $-NH_2$, -NHAc, -COOH, $-SO_2CH_3$, $-SCH_3$, $-OCH_3$,  , or A;

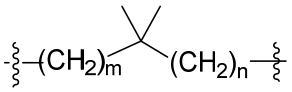
R^{1b} is C_2-C_5 alkyl;

X is selected from the group consisting of H and C_1-C_4 alkyl, wherein the alkyl is optionally substituted with A, -OH, or $-C(CH_3)_2OH$;

L^1 is selected from the group consisting of $-CH_2-$, $-CF_2-$,  , -O-, -S-, $-SO_2-$, -NH-, and $-CH_2CH_2-$;

Y is selected from the group consisting of C_1-C_3 alkyl, aryl, and heteroaryl, wherein the alkyl, aryl, and heteroaryl are optionally substituted with 1-5 substituents that are independently selected from A, C_1-C_3 alkyl, and C_1-C_3 alkoxy;

A is selected from the group consisting of  ,  ,  ,  ,  ,  , and  ;

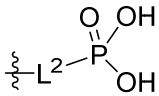
L^2 is selected from the group consisting of -$(CH_2)_n$-, -C(O)NH$(CH_2)_n$-, , , , -[O$(CH_2CH_2)]_n$-, -[O(C_1-C_4 alkylene)]-, -[O$(CH_2CH_2)]_n$-O$CH_2CH_2CF_2$-; -C(O)NHCH_2CH_2-[O$(CH_2CH_2)]_m$-; and -C(O)NHCH_2CH_2-[O$(CH_2CH_2)]_m$-O$CH_2CH_2CF_2$-;

m is an integer from zero to four;

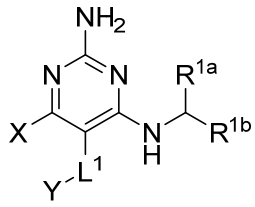
n is an integer from one to four;

wherein the compound is substituted with at least one A; and

when X is -CH_3; L^1 is -CH_2-; Y is aryl substituted with A; and L^2 is -CH_2-; then A is not -L^2-COOH, except when R^{1a} comprises –COOH or -SO_2CH_3; and

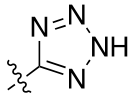
when X is -CH_3; L^1 is -CH_2-; Y is aryl substituted with A; L^2 is -CH_2-, –O-$(CH_2)_2$-O$(CH_2)_2$-, or –O-$(CH_2)_2$-O$(CH_2)_2(CF_2)$-; and A is ; then A and L^1 are not in a para position with respect to each other.

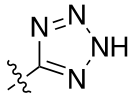
2. A compound having the structure of Formula (1), or a pharmaceutically acceptable salt thereof,



(1)

wherein

R^{1a} is selected from the group consisting of H, C_1-C_4 alkyl, -NH_2, -NHAc, -COOH, -SO_2CH_3, -SCH_3, -OCH_3, and ,

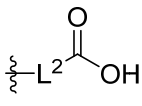
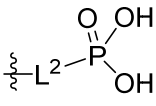
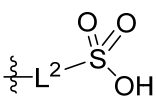
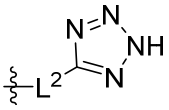
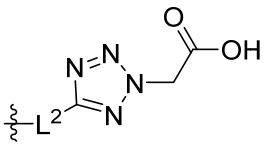
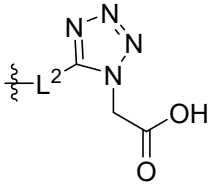
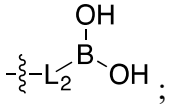
wherein the alkyl is optionally substituted with -OH, -NH_2, -NHAc, -COOH, -SO_2CH_3, -SCH_3, -OCH_3, or ;

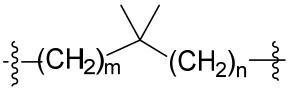
R^{1b} is C_2-C_5 alkyl;

X is selected from the group consisting of H and C_1-C_4 alkyl, wherein the alkyl is optionally substituted with A, -OH, or -$C(CH_3)_2OH$;

L^1 is selected from the group consisting of -CH_2-, -CF_2-, , -O-, -S-, -SO_2-, -NH-, and -CH_2CH_2-;

Y is selected from the group consisting of C_1-C_3 alkyl, aryl, and heteroaryl, wherein the alkyl, aryl, and heteroaryl are optionally substituted with 1-5 substituents that are independently selected from A, C_1-C_3 alkyl, and C_1-C_3 alkoxy;

A is selected from the group consisting of , , , , , , and ;

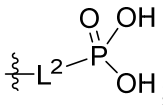
L^2 is selected from the group consisting of -$(CH_2)_n$-, -$C(O)NH(CH_2)_n$-, , , , -$[O(CH_2CH_2)]_n$-, -[$O(C_1$-C_4 alkylene)]-, -$[O(CH_2CH_2)]_n$-$OCH_2CH_2CF_2$-; -$C(O)NHCH_2CH_2$-$[O(CH_2CH_2)]_m$-; and -$C(O)NHCH_2CH_2$-$[O(CH_2CH_2)]_m$-$OCH_2CH_2CF_2$-;

m is an integer from zero to four; and

n is an integer from one to four; and

wherein the compound is substituted with at least one A; and

when X is -CH_3; L^1 is -CH_2-; Y is aryl substituted with A; and L^2 is -CH_2-; then A is not -L^2-COOH, except when R^{1a} comprises –COOH or –SO_2CH_3; and

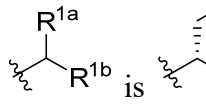
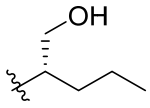
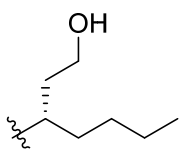
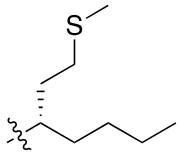
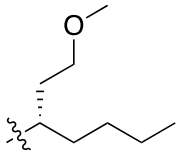
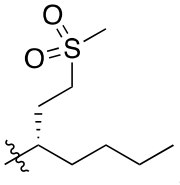
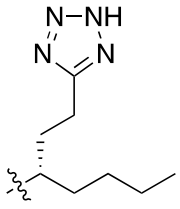
when X is -CH_3; L^1 is -CH_2-; Y is aryl substituted with A; L^2 is -CH_2-, –O-$(CH_2)_2$-O$(CH_2)_2$-, or –O-$(CH_2)_2$-O$(CH_2)_2(CF_2)$-; and A is ; then A and L^1 are not in a para position with respect to each other.

3. The compound of claim 1 or 2, or a pharmaceutically acceptable salt thereof, wherein R^{1b} is –$(CH_2)_2CH_3$.

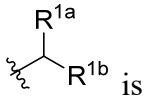
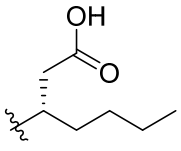
4. The compound of claim 1 or 2, or a pharmaceutically acceptable salt thereof, wherein R^{1b} is $–(CH_2)_3CH_3$.

5. The compound of any one of claims 1-4, or a pharmaceutically acceptable salt thereof, wherein R^{1a} is C_1-C_4 alkyl, optionally substituted with -OH, $-OCH_3$, $-SCH_3$, or $-SO_2CH_3$.

6. The compound of any one of claims 1-5, or a pharmaceutically acceptable salt thereof, wherein R^{1a} is $–CH_2C(CH_3)_2OH$.

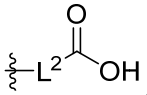
7. The compound of any one of claims 1-6, or a pharmaceutically acceptable salt thereof, wherein  is , , , , , or .

8. The compound of any one of claims 1-4, or a pharmaceutically acceptable salt thereof, wherein R^{1a} is C_1-C_4 alkyl, optionally substituted with -COOH.

9. The compound of any one of claims 1-4 and 8, or a pharmaceutically acceptable salt thereof, wherein  is .

10. The compound of any one of claims 1-4, or a pharmaceutically acceptable salt thereof, wherein R^{1a} is H.

11. The compound of any one of claims 1-10, or a pharmaceutically acceptable salt thereof, wherein X is C_1-C_4 alkyl, wherein the alkyl is substituted with A.

12. The compound of any one of claims 1-11, or a pharmaceutically acceptable salt thereof, wherein X is C_1-C_4 alkyl, wherein the alkyl is substituted with .

13. The compound of any one of claims 1-10, or a pharmaceutically acceptable salt thereof, wherein X is CH_3.

14. The compound of any one of claims 1-10, or a pharmaceutically acceptable salt thereof, wherein X is H.

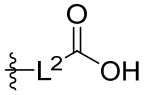
15. The compound of any one of claims 1-14, or a pharmaceutically acceptable salt thereof, wherein L^1 is -CH_2-, -CH_2CH_2-, -O-, or -S-.

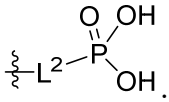
16. The compound of any one of claims 1-15, or a pharmaceutically acceptable salt thereof, wherein L^1 is -CH_2-.

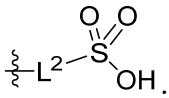
17. The compound of any one of claims 1-16, or a pharmaceutically acceptable salt thereof, wherein Y is C_1-C_3 alkyl or aryl.

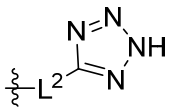
18. The compound of any one of claims 1-17, or a pharmaceutically acceptable salt thereof, wherein Y is aryl, wherein the aryl is substituted with C1-C3 alkoxy.

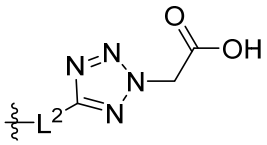
19. The compound of any one of claims 1-18, or a pharmaceutically acceptable salt thereof, wherein Y is aryl, wherein the aryl is substituted with A.

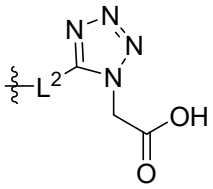
20. The compound of any one of claims 1-19, or a pharmaceutically acceptable salt thereof, wherein A is .

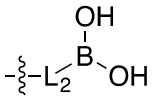
21. The compound of any one of claims 1-19, or a pharmaceutically acceptable salt thereof, wherein A is .

22. The compound of any one of claims 1-19, or a pharmaceutically acceptable salt thereof, wherein A is .

23. The compound of any one of claims 1-19, or a pharmaceutically acceptable salt thereof, wherein A is .

24. The compound of any one of claims 1-19, or a pharmaceutically acceptable salt thereof, wherein A is .

25. The compound of any one of claims 1-19, or a pharmaceutically acceptable salt thereof, wherein A is .

26. The compound of any one of claims 1-19, or a pharmaceutically acceptable salt thereof, wherein A is .

27. The compound of any one of claims 1-26, or a pharmaceutically acceptable salt thereof, wherein L^2 is $-(CH_2)_n-$.

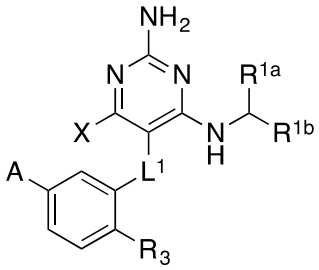
28. The compound of any one of claims 1-27, or a pharmaceutically acceptable salt thereof, wherein n is one or two.

29. The compound of any one of claims 1-26, or a pharmaceutically acceptable salt thereof, wherein L^2 is .

30. The compound of any one of claims 1-26, or a pharmaceutically acceptable salt thereof, wherein L^2 is .

31. The compound of any one of claims 1-26, or a pharmaceutically acceptable salt thereof, wherein L^2 is -C(O)NH$(CH_2)_n$-.

32. A compound of claim 1 or 2, or a pharmaceutically acceptable salt thereof, wherein the compound of Formula (1) is a compound of Formula (1a),

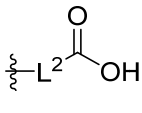
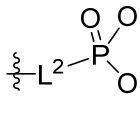
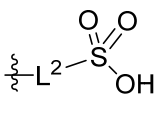
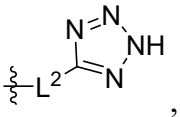
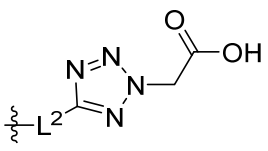
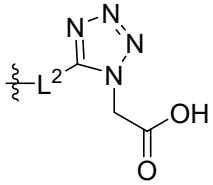
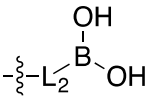


(1a)

wherein

X is H or CH_3

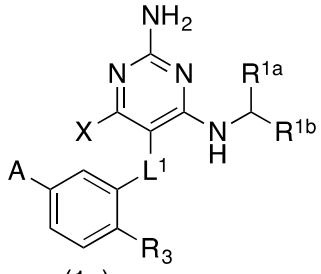
L^1 is selected from the group consisting of -CH_2-, -O-, -S-, -CF_2-, , and -CH_2CH_2-;

A is selected from the group consisting of , , , , , , and ;

L^2 is selected from the group consisting of -CH_2-, -CH_2CH_2-, , , -C(O)NH$(CH_2)_n$-, -[O(CH_2CH_2)]$_n$-, -[O(C_1-C_4 alkylene)]-, and -[O(CH_2CH_2)]$_n$-$OCH_2CH_2CF_2$-; -C(O)NHCH_2CH_2-[O(CH_2CH_2)]$_m$-; C(O)NHCH_2CH_2-[O(CH_2CH_2)]$_m$-$OCH_2CH_2CF_2$-; and

R^3 is H, C_1-C_3 alkyl, or C_1-C_3 alkoxy.

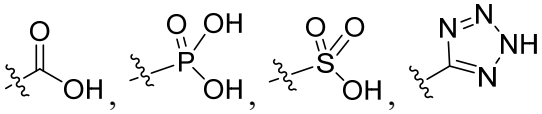
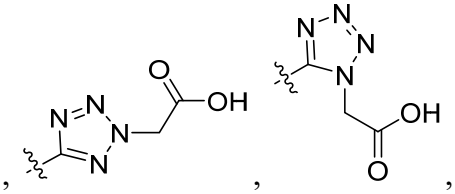
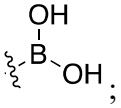
33. A compound of claim 1 or 2, or a pharmaceutically acceptable salt thereof, wherein the compound of Formula (1) is a compound of Formula (1a),



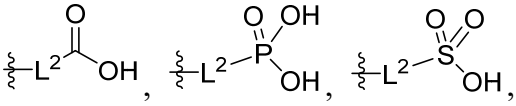
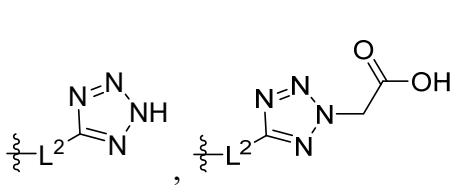
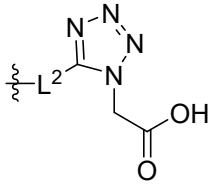
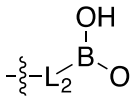
(1a)

wherein

X is $-CH_2-A^{1a}$, $-CH_2CH_2-A^{1a}$, $-CH_2CH_2CH_2-A^{1a}$, or $-CH_2C(CH_3)_2-A^{1a}$;

A^{1a} is selected from the group consisting of , , , and ;

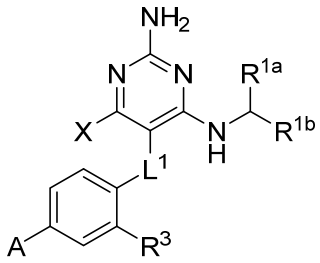
L^1 is selected from the group consisting of $-CH_2-$, -O-, -S-, $-CF_2-$, , and $-CH_2CH_2-$;

A is selected from the group consisting of , , , , and ;

L^2 is selected from the group consisting of $-CH_2-$, $-CH_2CH_2-$, , , $-C(O)NH(CH_2)_n-$, $-[O(CH_2CH_2)]_n-$, $-[O(C_1-C_4\ alkylene)]-$, and $-[O(CH_2CH_2)]_n-OCH_2CH_2CF_2-$; $-C(O)NHCH_2CH_2-[O(CH_2CH_2)]_m-$; $C(O)NHCH_2CH_2-[O(CH_2CH_2)]_m-OCH_2CH_2CF_2-$; and

R^3 is H, C_1-C_3 alkyl, or C_1-C_3 alkoxy.

34. A compound of claim 1 or 2, or a pharmaceutically acceptable salt thereof, wherein the compound of Formula (1) is a compound of Formula (1b),

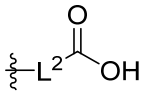
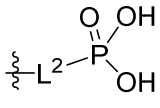
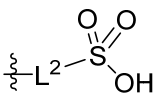
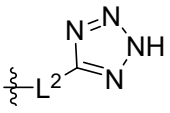
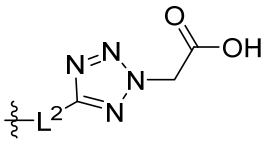
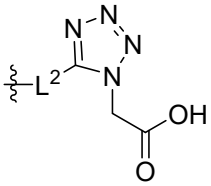
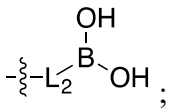


(1b)

wherein

X is H or CH_3;

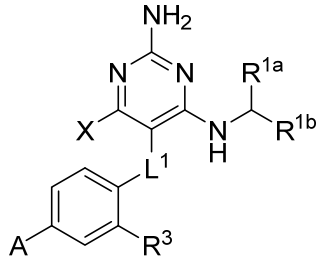
L^1 is selected from the group consisting of -CH_2-, -O-, -S-, -CF_2-, ,
and -CH_2CH_2-;

A is selected from the group consisting of , , ,
, , and , and ;

L^2 is selected from the group consisting of -CH_2-, -CH_2CH_2-, , ,
-C(O)NH$(CH_2)_n$-, -[O$(CH_2CH_2)]_n$-, -[O(C_1-C_4 alkylene)]-, and -[O$(CH_2CH_2)]_n$-
O$CH_2CH_2CF_2$-; -C(O)NHCH_2CH_2-[O$(CH_2CH_2)]_m$-; C(O)NHCH_2CH_2-[O$(CH_2CH_2)]_m$-
O$CH_2CH_2CF_2$-; and

R^3 is H, C_1-C_3 alkyl, or C_1-C_3 alkoxy.

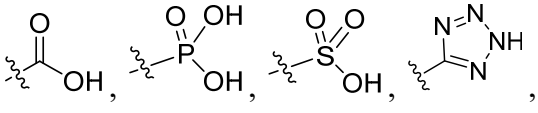
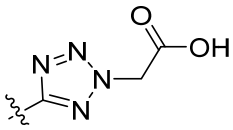
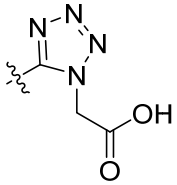
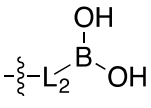
35. A compound of claim 1 or 2, or a pharmaceutically acceptable salt thereof, wherein the compound of Formula (1) is a compound of Formula (1b),



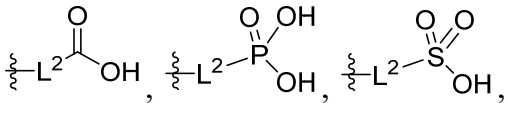
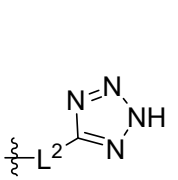
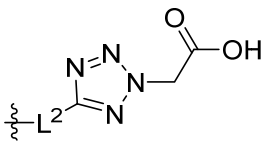
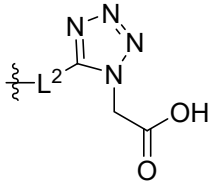
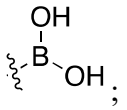
(1b)

wherein

X is -CH_2-A^{1a}, -CH_2CH_2-A^{1a}, -$CH_2CH_2CH_2$-A^{1a}, or -$CH_2C(CH_3)_2$-A^{1a};

A^{1a} is selected from the group consisting of , , , and ;

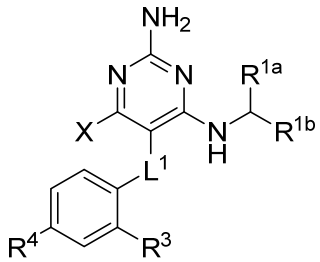
L^1 is selected from the group consisting of -CH_2-, -O-, -S-, -CF_2-, , and -CH_2CH_2-;

A is selected from the group consisting of , , , , and ;

L^2 is selected from the group consisting of -CH_2-, -CH_2CH_2-, , , -C(O)NH$(CH_2)_n$-, -[O$(CH_2CH_2)]_n$-, -[O(C_1-C_4 alkylene)]-, and -[O$(CH_2CH_2)]_n$-$OCH_2CH_2CF_2$-; -C(O)NHCH_2CH_2-[O$(CH_2CH_2)]_m$-; C(O)NHCH_2CH_2-[O$(CH_2CH_2)]_m$-$OCH_2CH_2CF_2$-; and

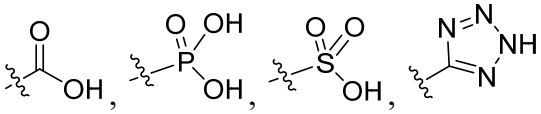
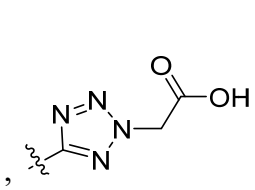
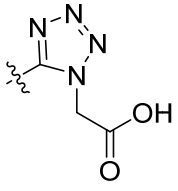
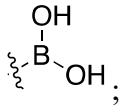
R^3 is H, C_1-C_3 alkyl, or C_1-C_3 alkoxy.

36. A compound of claim 1 or 2, or a pharmaceutically acceptable salt thereof, wherein the compound of Formula (1) is a compound of Formula (1c),


(1c)

wherein

X is -CH_2-A^{1a}, -CH_2CH_2-A^{1a}, -$CH_2CH_2CH_2$-A^{1a}, or -$CH_2C(CH_3)_2$-A^{1a};

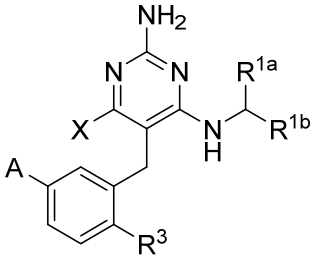
A^{1a} is selected from the group consisting of , , , and ;

L^1 is selected from the group consisting of -CH_2-, -O-, -S-, -CF_2-, , and -CH_2CH_2-;

R^3 is H, C_1-C_3 alkyl, or C_1-C_3 alkoxy; and

R^4 is H or C_1-C_3 alkoxy.

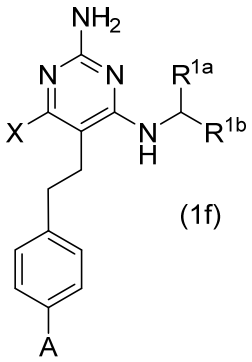
37. A compound of claim 1 or 2, or a pharmaceutically acceptable salt thereof, wherein the compound of Formula (1) is a compound of Formula (1e),



(1e)

wherein R^3 is H, C_1-C_3 alkyl, or C_1-C_3 alkoxy.

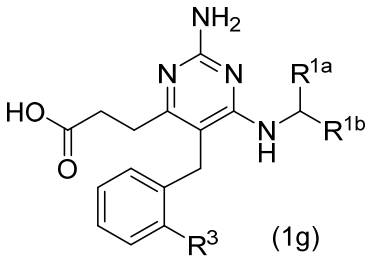
38. A compound of claim 1 or 2, or a pharmaceutically acceptable salt thereof, wherein the compound of Formula (1) is a compound of Formula (1f),



(1f)

.

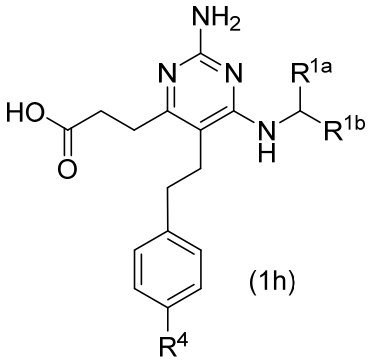
39. A compound of claim 1 or 2, or a pharmaceutically acceptable salt thereof, wherein the compound of Formula (1) is a compound of Formula (1g),



(1g)

wherein R^3 is H, C_1-C_3 alkyl, or C_1-C_3 alkoxy.

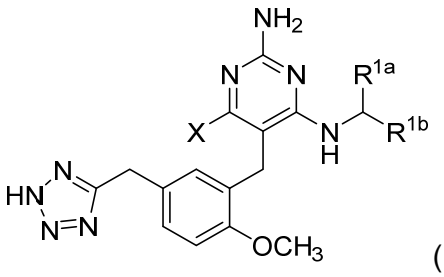
40. A compound of claim 1 or 2, or a pharmaceutically acceptable salt thereof, wherein the compound of Formula (1) is a compound of Formula (1h),



(1h)

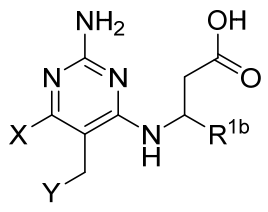
wherein R^4 is H or C_1-C_3 alkoxy.

41. A compound of claim 1 or 2, or a pharmaceutically acceptable salt thereof, wherein the compound of Formula (1) is a compound of Formula (1j),



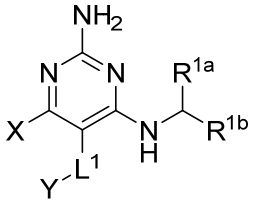
(1j).

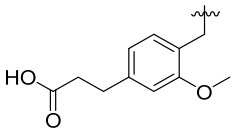
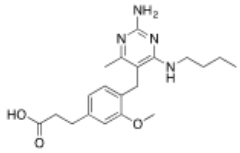
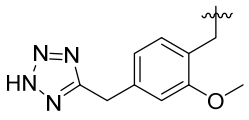
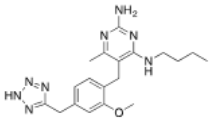
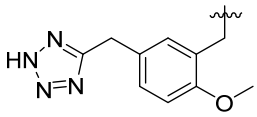
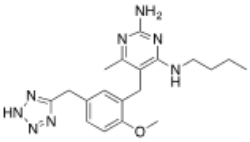
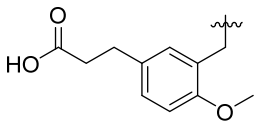
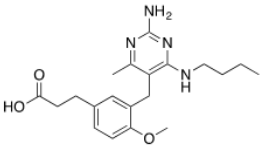
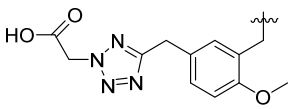
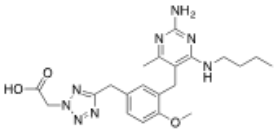
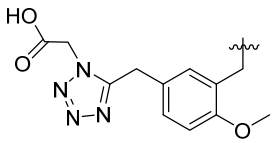
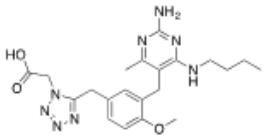
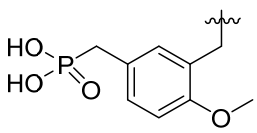
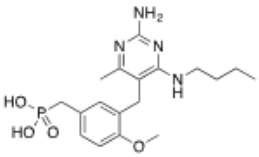
42. A compound of claim 1 or 2, or a pharmaceutically acceptable salt thereof, wherein the compound of Formula (1) is a compound of Formula (1k),

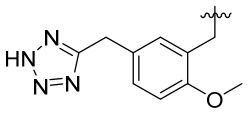
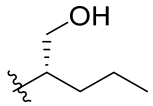
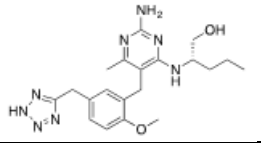
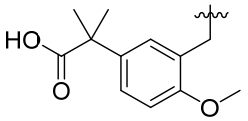
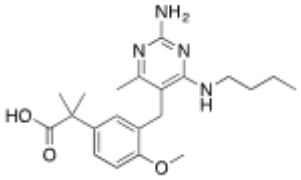
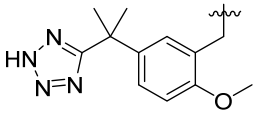
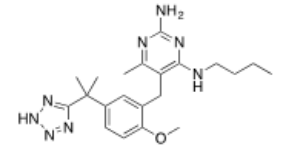
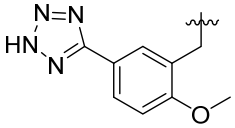
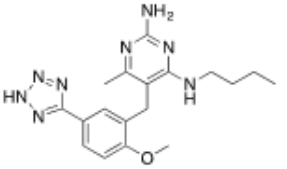
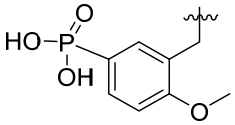
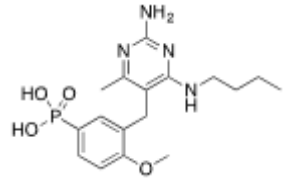
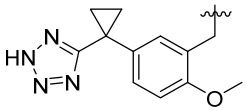
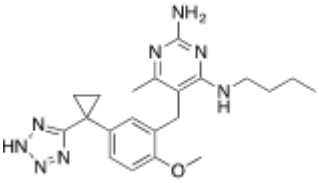
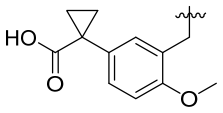
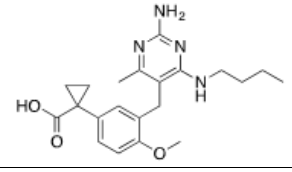
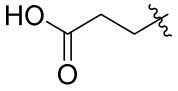
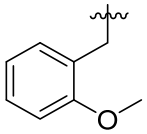
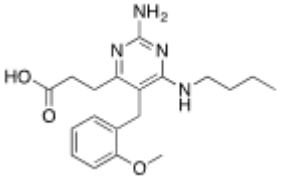


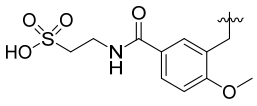
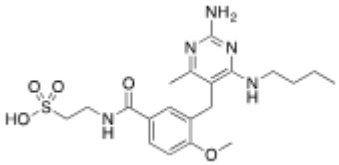
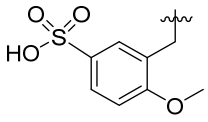
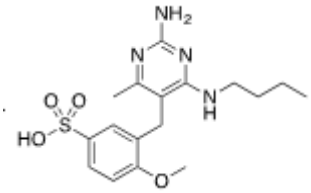
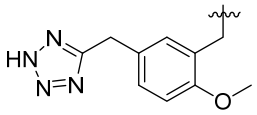
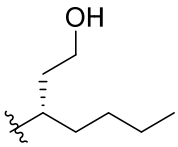
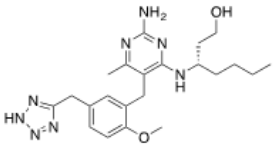
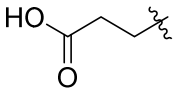
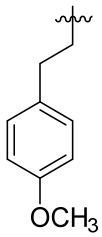
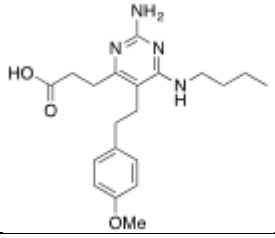
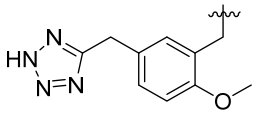
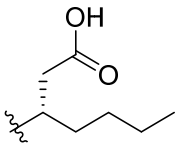
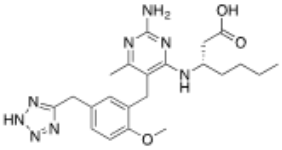
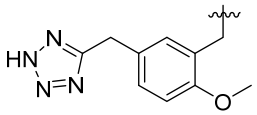
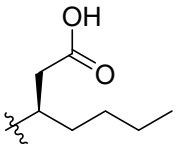
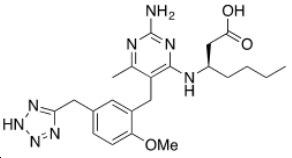
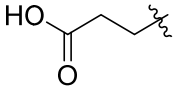
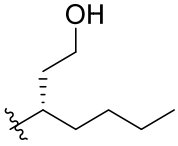
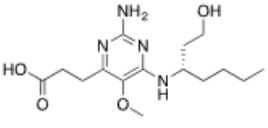
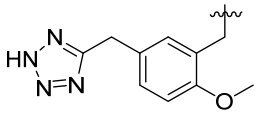
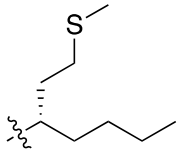
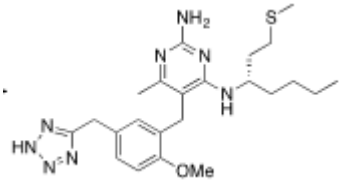
(1k).

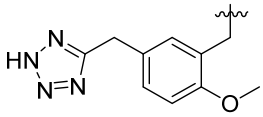
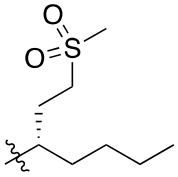
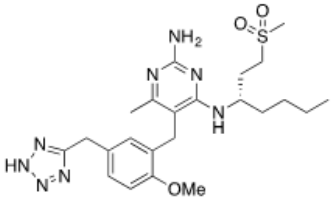
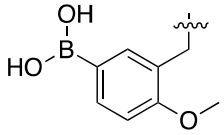
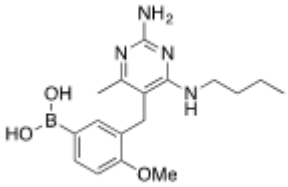
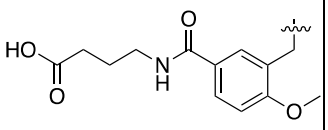
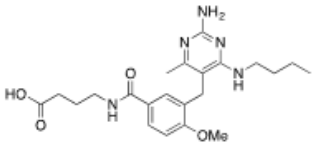
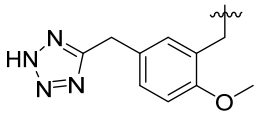
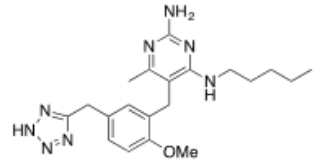
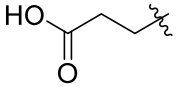
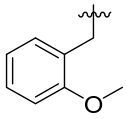
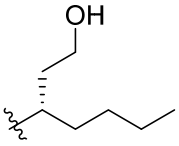
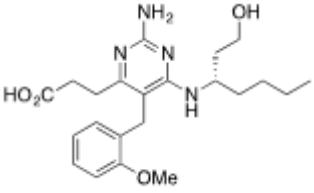
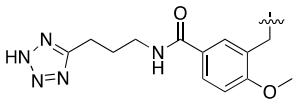
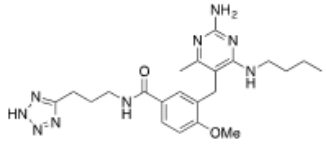
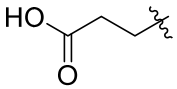
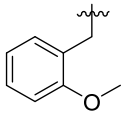
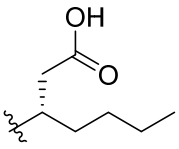
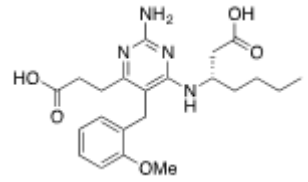
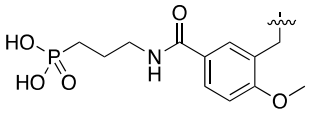
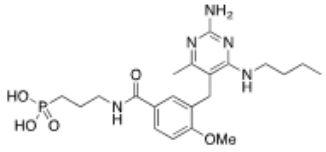
43. A compound, or a pharmaceutically acceptable salt, selected from the group consisting of:

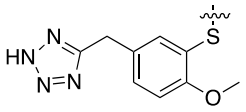
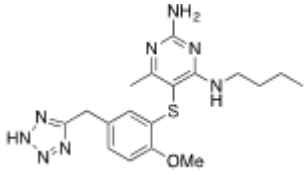
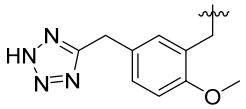
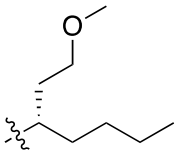
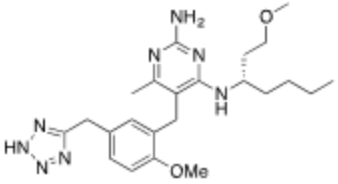
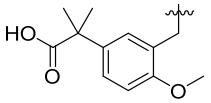
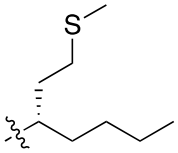
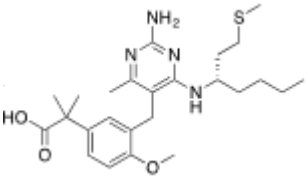
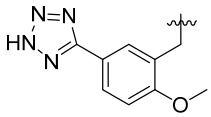
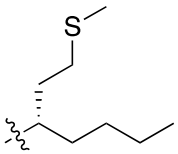
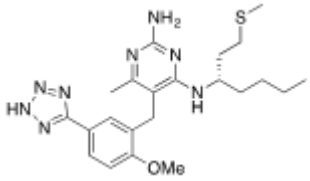
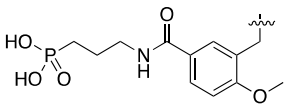
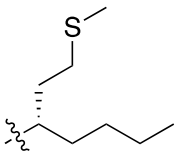
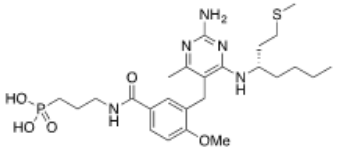
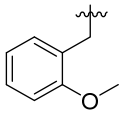
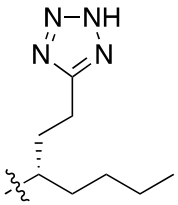
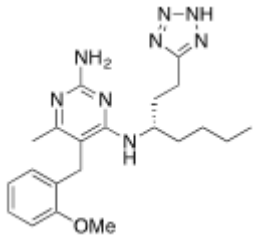
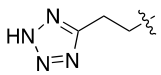
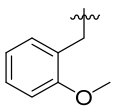
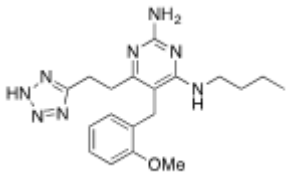


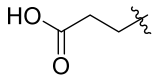
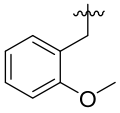
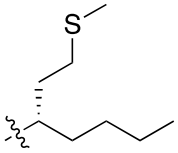
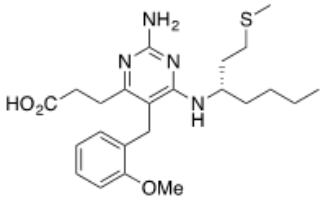
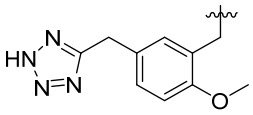
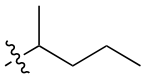
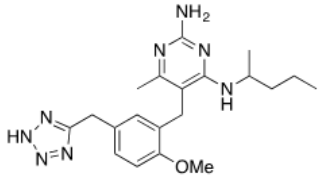
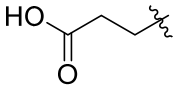
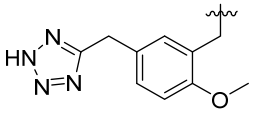
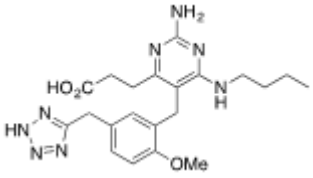
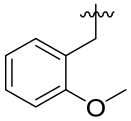
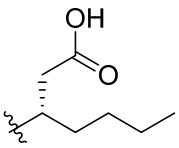
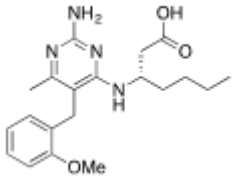
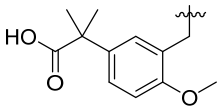
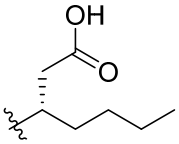
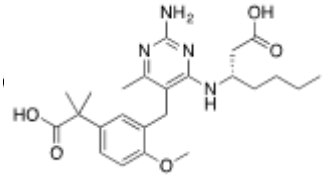
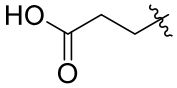
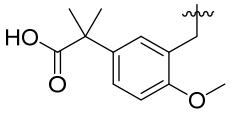
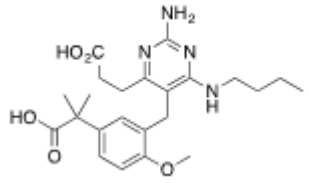
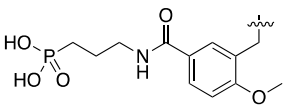
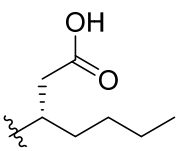
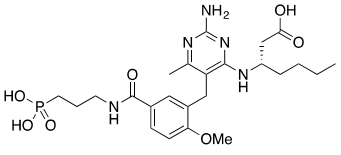
Com-poun d	-X	-L^1-Y	R^{1a} / R^{1b}	Compound
1	-CH_3		-$(CH_2)_3CH_3$	
2	-CH_3		-$(CH_2)_3CH_3$	
3	-CH_3		-$(CH_2)_3CH_3$	
4	-CH_3		-$(CH_2)_3CH_3$	
5	-CH_3		-$(CH_2)_3CH_3$	
6	-CH_3		-$(CH_2)_3CH_3$	
7	-CH_3		-$(CH_2)_3CH_3$	

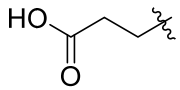
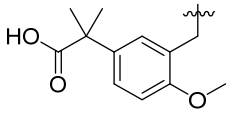
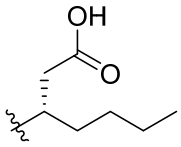
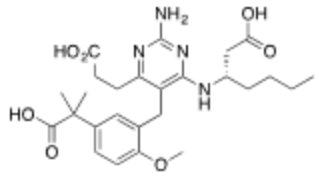
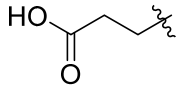
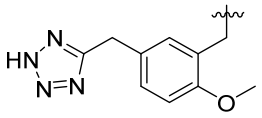
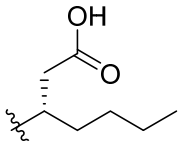
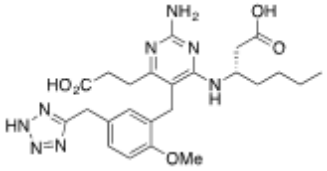
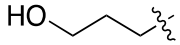
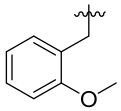
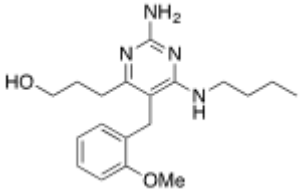
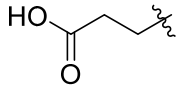
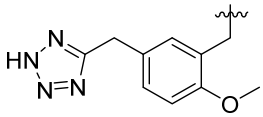
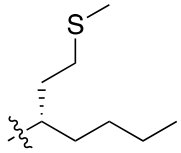
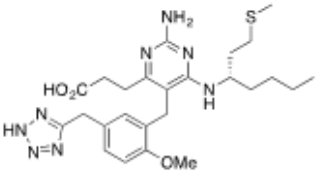
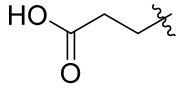
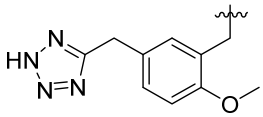
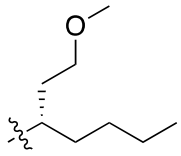
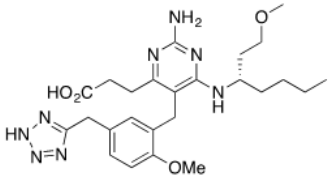
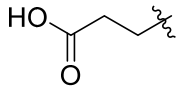
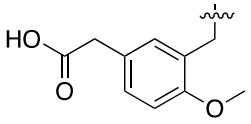
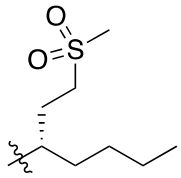
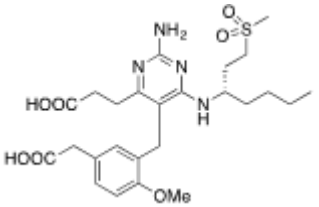
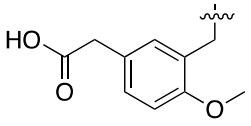
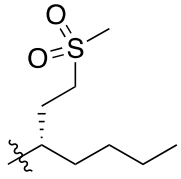
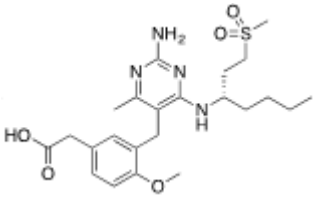
Com-pound	-X	-L[1]-Y	R^{1a} / R^{1b}	Compound
8	-CH_3			
9	-CH_3		-$(CH_2)_3CH_3$	
10	-CH_3		-$(CH_2)_3CH_3$	
11	-CH_3		-$(CH_2)_3CH_3$	
12	-CH_3		-$(CH_2)_3CH_3$	
13	-CH_3		-$(CH_2)_3CH_3$	
14	-CH_3		-$(CH_2)_3CH_3$	
15			-$(CH_2)_3CH_3$	

Com-pound	-X	-L[1]-Y	R^{1a} / R^{1b}	Compound
16	$-CH_3$		$-(CH_2)_3CH_3$	
17	$-CH_3$		$-(CH_2)_3CH_3$	
18	$-CH_3$			
19			$-(CH_2)_3CH_3$	
20	$-CH_3$			
20C	$-CH_3$			
21		$-OCH_3$		
22	$-CH_3$			

Com-poun d	-X	-L[1]-Y	R^{1a} R^{1b}	Compound
23	-CH_3			
24	-CH_3		-$(CH_2)_3CH_3$	
25	-CH_3		-$(CH_2)_3CH_3$	
26	-CH_3		-$(CH_2)_4CH_3$	
27				
28	-CH_3		-$(CH_2)_3CH_3$	
29				
30	-CH_3		-$(CH_2)_3CH_3$	

Com-pound	-X	-L[1]-Y	R^{1a} / R^{1b}	Compound
31	-CH_3		-$(CH_2)_3CH_3$	
32	-CH_3			
33	-CH_3			
34	-CH_3			
35	-CH_3			
36	-CH_3			
37			-$(CH_2)_3CH_3$	

Com-poun d	-X	-L^1-Y	R^{1a} / R^{1b}	Compound
38				
39	-CH_3			
40			-$(CH_2)_3CH_3$	
41	-CH_3			
42	-CH_3			
43			-$(CH_2)_3CH_3$	
44	-CH_3			

Com-poun d	-X	-L[1]-Y	R^{1a} / R^{1b}	Compound
45				
46				
47			-$(CH_2)_3CH_3$	
48				
49				
50				
51	-CH_3			

44. A pharmaceutical composition comprising a compound of any one of claims 1 to 43, or a pharmaceutically acceptable salt thereof, and a pharmaceutically acceptable carrier.

45. A compound of any one of claims 1 to 43, or a pharmaceutically acceptable salt thereof, for use in therapy.

46. Use of a compound of any one of claims 1 to 43, or a pharmaceutically acceptable salt thereof, in the manufacture of a medicament for treating a condition associated with TLR7 modulation, wherein the condition is viral infection or cancer.

47. A pharmaceutical composition of claim 44, further comprising at least one or more additional therapeutic agents.

48. The pharmaceutical composition of claim 47, wherein the at least one or more additional therapeutic agent is antiviral nucleoside.

49. The pharmaceutical composition of claim 47, wherein the at least one or more additional therapeutic agent is PD-1 antibody or PD-L1 antibody.

50. Use of a compound of any one of claims 1 to 43, or a pharmaceutically acceptable salt thereof, in the manufacture of a medicament for treating HBV in a subject in need thereof, wherein the medicament is to be co-administered in combination with an antiviral nucleoside.

51. Use of a compound of any one of claims 1 to 43, or a pharmaceutically acceptable salt thereof, in the manufacture of a medicament for treating cancer in a subject in need thereof, wherein the medicament is to be co-administered in combination with a PD-1 antibody or PD-L1 antibody.