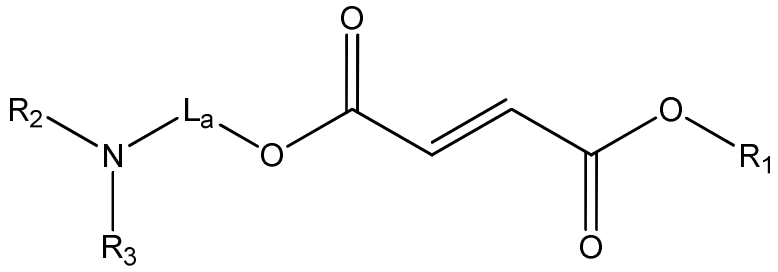
CLAIMS

What is claimed:

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



(I);

wherein:

R_1 is unsubstituted methyl;

L_a is unsubstituted C_2-C_4 alkyl linker;

R_2 is H, C_1-C_6 alkyl, C_2-C_6 alkenyl, C_6-C_{10} aryl, C_3-C_{10} carbocycle, heterocycle comprising one or two 5- or 6-member rings and 1-4 heteroatoms selected from N, O and S, or heteroaryl comprising one or two 5- or 6-member rings and 1-4 heteroatoms selected from N, O and S, wherein the alkyl, alkenyl, aryl, carbocycle, heterocycle, or heteroaryl groups may be optionally independently substituted one or more times with C_1-C_3-alkyl, OH, O(C_1-C_4 alkyl), carbonyl, halo, NH_2, N(H)(C_1-C_6 alkyl), N(C_1-C_6 alkyl)$_2$, SO_2H, SO_2(C_1-C_6 alkyl), CHO, CO_2H, CO_2(C_1-C_6 alkyl), or CN; and

R_3 is C_1-C_6 alkyl, C_2-C_6 alkenyl, C_6-C_{10} aryl, C_3-C_{10} carbocycle, heterocycle comprising one or two 5- or 6-member rings and 1-4 heteroatoms selected from N, O and S, or heteroaryl comprising one or two 5- or 6-member rings and 1-4 heteroatoms selected from N, O and S, wherein the alkyl, alkenyl, aryl, carbocycle, heterocycle, or heteroaryl groups may be optionally independently substituted one or more times with C_1-C_3-alkyl, OH, O(C_1-C_4 alkyl), carbonyl, halo, NH_2, N(H)(C_1-C_6 alkyl), N(C_1-C_6 alkyl)$_2$, SO_2H, SO_2(C_1-C_6 alkyl), CHO, CO_2H, CO_2(C_1-C_6 alkyl), or CN;

or alternatively, R_2 and R_3, together with the nitrogen atom to which they are attached, form a heteroaryl comprising one or two 5- or 6-member rings and 1-4 heteroatoms selected from N, O and S; wherein the heteroaryl may be optionally substituted one or more times with C_1-C_6 alkyl, CN, OH, halo, O(C_1-C_6 alkyl), CHO, carbonyl, thione, NO, or NH_2.

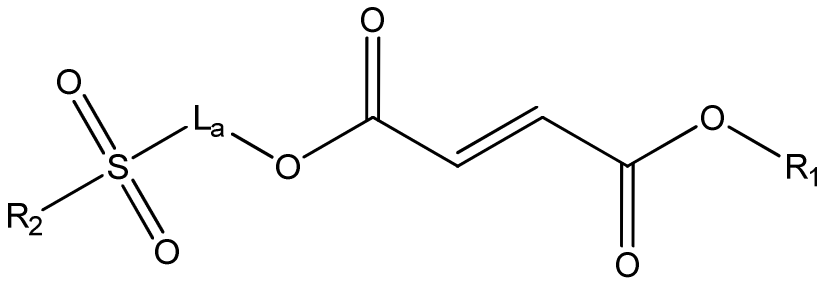
2. The compound of claim 1, wherein L_a is an unsubstituted C_2-C_3 alkyl linker.

3. The compound according to any of the preceding claims, wherein L_a is an unsubstituted C_2 alkyl linker.

4. The compound according to any of the preceding claims, wherein R_2 and R_3, together with the nitrogen to which they are attached, form an unsubstituted heteroaryl comprising one or two 5- or 6-member rings and 1-4 heteroatoms, wherein the heteroatom at each occurrence independently is N, O or S.

5. The compound according to any one of claims 1 to 3, wherein R_2 and R_3, together with the nitrogen atom to which they are attached, form a substituted heteroaryl comprising one or two 5- or 6-member rings and 1-4 heteroatoms selected from N, O and S wherein the heteroaryl is substituted one or more times with C_1-C_6 alkyl, CN, OH, halo, O(C_1-C_6 alkyl), CHO, carbonyl, thione, NO, or NH_2.

6. A compound of Formula (Ia), or a pharmaceutically acceptable salt thereof:



(Ia);

wherein:

R_1 is unsubstituted C_1-C_6 alkyl;

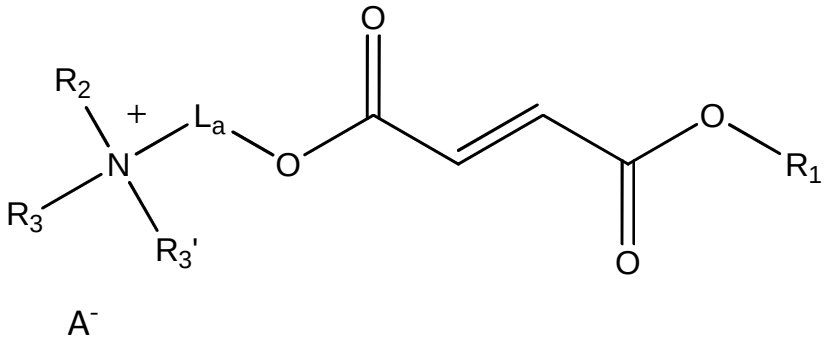
L_a is unsubstituted C_2-C_4 alkyl linker; and

R_2 is H, substituted or unsubstituted C_1-C_6 alkyl, substituted or unsubstituted C_2-C_6 alkenyl, substituted or unsubstituted C_2-C_6 alkynyl, substituted or unsubstituted C_6-C_{10} aryl, substituted or unsubstituted C_3-C_{10} carbocycle, substituted or unsubstituted heterocycle comprising one or two 5- or 6-member rings and 1-4 heteroatoms selected from N, O and S, or

substituted or unsubstituted heteroaryl comprising one or two 5- or 6-member rings and 1-4 heteroatoms selected from N, O and S

wherein the “substituted” refers to replacing one or more hydrogen atoms in a given structure with a substituent selected from alkyl, alkenyl, alkynyl, halogen, hydroxyl, alkoxy, alkylcarbonyloxy, arylcarbonyloxy, alkoxycarbonyloxy, aryloxycarbonyloxy, carboxylate, alkylcarbonyl, alkylaminocarbonyl, aralkylaminocarbonyl, alkenylaminocarbonyl, dialkylaminocarbonyl, alkylcarbonyl, arylcarbonyl, aralkylcarbonyl, alkenylcarbonyl, alkoxycarbonyl, aminocarbonyl, alkylthiocarbonyl, phosphate, phosphonato, phosphinato, amino, alkylamino, dialkylamino, arylamino, diarylamino, alkylarylamino, acylamino, alkylcarbonylamino, arylcarbonylamino, carbamoyl, ureido, amidino, imino, sulfhydryl, alkylthio, arylthio, thiocarboxylate, sulfates, alkylsulfinyl, sulfonato, sulfamoyl, sulfonamido, nitro, trifluoromethyl, cyano, azido, heterocyclyl, alkylaryl, aromatic or heteroaromatic moiety.

7. A compound of Formula (Ib):



(Ib)

wherein:

A^- is a pharmaceutically acceptable anion;

R_1 is unsubstituted methyl;

L_a is unsubstituted C_2 alkyl linker;

R_3’ is substituted or unsubstituted C_1-C_6 alkyl; and

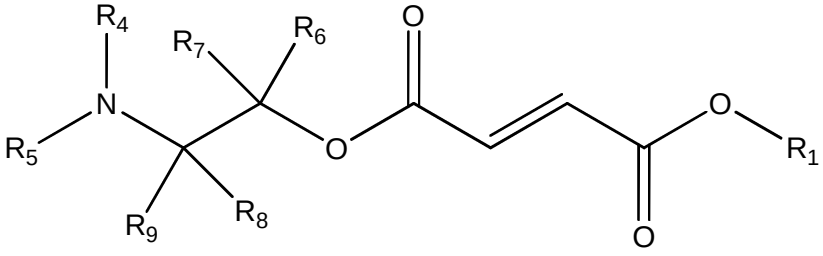
R_2 and R_3 are each, independently, H, substituted or unsubstituted C_1-C_6 alkyl, substituted or unsubstituted C_2-C_6 alkenyl, substituted or unsubstituted C_2-C_6 alkynyl, substituted or unsubstituted C_6-C_{10} aryl, substituted or unsubstituted C_3-C_{10} carbocycle, substituted or unsubstituted heterocycle comprising one or two 5- or 6-member rings and 1-4 heteroatoms

selected from N, O and S, or substituted or unsubstituted heteroaryl comprising one or two 5- or 6-member rings and 1-4 heteroatoms selected from N, O and S;

or alternatively, R_2 and R_3, together with the nitrogen atom to which they are attached, form a substituted or unsubstituted heteroaryl comprising one or two 5- or 6-member rings and 1-4 heteroatoms selected from N, O and S, or a substituted or unsubstituted heterocycle comprising one or two 5- or 6-member rings and 1-4 heteroatoms selected from N, O and S

wherein the "substituted" refers to replacing one or more hydrogen atoms in a given structure with a substituent selected from alkyl, alkenyl, alkynyl, halogen, hydroxyl, alkoxy, alkylcarbonyloxy, arylcarbonyloxy, alkoxycarbonyloxy, aryloxycarbonyloxy, carboxylate, alkylcarbonyl, alkylaminocarbonyl, aralkylaminocarbonyl, alkenylaminocarbonyl, dialkylaminocarbonyl, alkylcarbonyl, arylcarbonyl, aralkylcarbonyl, alkenylcarbonyl, alkoxycarbonyl, aminocarbonyl, alkylthiocarbonyl, phosphate, phosphonato, phosphinato, amino, alkylamino, dialkylamino, arylamino, diarylamino, alkylarylamino, acylamino, alkylcarbonylamino, arylcarbonylamino, carbamoyl, ureido, amidino, imino, sulfhydryl, alkylthio, arylthio, thiocarboxylate, sulfates, alkylsulfinyl, sulfonato, sulfamoyl, sulfonamido, nitro, trifluoromethyl, cyano, azido, heterocyclyl, alkylaryl, aromatic or heteroaromatic moiety.

8. A compound of Formula (II), or a pharmaceutically acceptable salt thereof:



(II);

wherein:

R_1 is unsubstituted methyl;

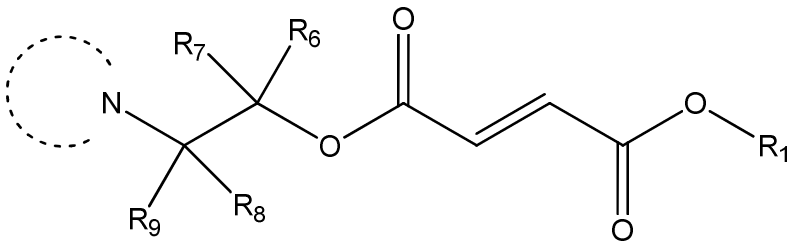
R_4 is H, substituted or unsubstituted C_1-C_6 alkyl, substituted or unsubstituted C_2-C_6 alkenyl, substituted or unsubstituted C_2-C_6 alkynyl, substituted or unsubstituted C_6-C_{10} aryl, substituted or unsubstituted C_3-C_{10} carbocycle, substituted or unsubstituted heterocycle comprising one or two 5- or 6-member rings and 1-4 heteroatoms selected from N, O and S, or substituted or unsubstituted heteroaryl comprising one or two 5- or 6-member rings and 1-4 heteroatoms selected from N, O and S;

R_5 is substituted or unsubstituted C_1-C_6 alkyl, substituted or unsubstituted C_2-C_6 alkenyl, substituted or unsubstituted C_2-C_6 alkynyl, substituted or unsubstituted C_6-C_{10} aryl, substituted or unsubstituted C_3-C_{10} carbocycle, substituted or unsubstituted heterocycle comprising one or two 5- or 6-member rings and 1-4 heteroatoms selected from N, O and S, or substituted or unsubstituted heteroaryl comprising one or two 5- or 6-member rings and 1-4 heteroatoms selected from N, O and S; and

R_6, R_7, R_8 and R_9 are each H;

wherein the "substituted" refers to replacing one or more hydrogen atoms in a given structure with a substituent selected from alkyl, alkenyl, alkynyl, halogen, hydroxyl, alkoxy, alkylcarbonyloxy, arylcarbonyloxy, alkoxycarbonyloxy, aryloxycarbonyloxy, carboxylate, alkylcarbonyl, alkylaminocarbonyl, aralkylaminocarbonyl, alkenylaminocarbonyl, dialkylaminocarbonyl, alkylcarbonyl, arylcarbonyl, aralkylcarbonyl, alkenylcarbonyl, alkoxycarbonyl, aminocarbonyl, alkylthiocarbonyl, phosphate, phosphonato, phosphinato, amino, alkylamino, dialkylamino, arylamino, diarylamino, alkylarylamino, acylamino, alkylcarbonylamino, arylcarbonylamino, carbamoyl, ureido, amidino, imino, sulfhydryl, alkylthio, arylthio, thiocarboxylate, sulfates, alkylsulfinyl, sulfonato, sulfamoyl, sulfonamido, nitro, trifluoromethyl, cyano, azido, heterocyclyl, alkylaryl, aromatic or heteroaromatic moiety.

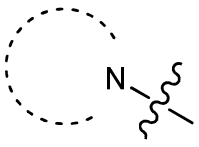
9. A compound of Formula (III), or a pharmaceutically acceptable salt thereof:



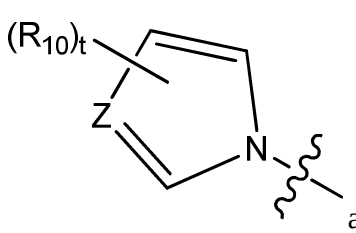
(III);

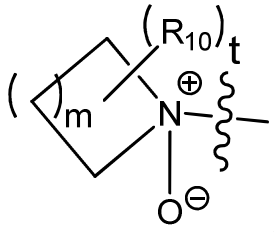
wherein:

R_1 is unsubstituted methyl;



is selected from the group consisting of:



and


;

Z is C or N;

m is 0, 1, 2, or 3;

t is 0, 1, 2, 3, 4, 5, 6, 7, 8, 9 or 10;

R_6, R_7, R_8 and R_9 are each H; and

each R_{10} is, independently, H, halogen, substituted or unsubstituted C_1-C_6 alkyl, substituted or unsubstituted C_2-C_6 alkenyl, substituted or unsubstituted C_2-C_6 alkynyl, substituted or unsubstituted C_3-C_{10} carbocycle, substituted or unsubstituted heterocycle comprising one or two 5- or 6-member rings and 1-4 heteroatoms selected from N, O and S, or substituted or unsubstituted heteroaryl comprising one or two 5- or 6-member rings and 1-4 heteroatoms selected from N, O and S;

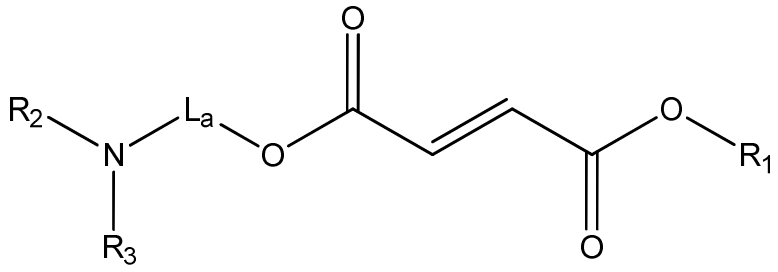
or, alternatively, two R_{10}'s attached to the same carbon atom, together with the carbon atom to which they are attached, form a carbonyl, substituted or unsubstituted C_3-C_{10} carbocycle, substituted or unsubstituted heterocycle comprising one or two 5- or 6-member rings and 1-4 heteroatoms selected from N, O and S, or substituted or unsubstituted heteroaryl comprising one or two 5- or 6-member rings and 1-4 heteroatoms selected from N, O and S;

or, alternatively, two R_{10}'s attached to different atoms, together with the atoms to which they are attached, form a substituted or unsubstituted C_3-C_{10} carbocycle, substituted or unsubstituted heterocycle comprising one or two 5- or 6-member rings and 1-4 heteroatoms selected from N, O and S, or substituted or unsubstituted heteroaryl comprising one or two 5- or 6-member rings and 1-4 heteroatoms selected from N, O and S

wherein the "substituted" refers to replacing one or more hydrogen atoms in a given structure with a substituent selected from alkyl, alkenyl, alkynyl, halogen, hydroxyl, alkoxy, alkylcarbonyloxy, arylcarbonyloxy, alkoxycarbonyloxy, aryloxycarbonyloxy, carboxylate, alkylcarbonyl, alkylaminocarbonyl, aralkylaminocarbonyl, alkenylaminocarbonyl, dialkylaminocarbonyl, alkylcarbonyl, arylcarbonyl, aralkylcarbonyl, alkenylcarbonyl, alkoxycarbonyl, aminocarbonyl, alkylthiocarbonyl, phosphate, phosphonato, phosphinato,

amino, alkylamino, dialkylamino, arylamino, diarylamino, alkylarylamino, acylamino, alkylcarbonylamino, arylcarbonylamino, carbamoyl, ureido, amidino, imino, sulfhydryl, alkylthio, arylthio, thiocarboxylate, sulfates, alkylsulfinyl, sulfonato, sulfamoyl, sulfonamido, nitro, trifluoromethyl, cyano, azido, heterocyclyl, alkylaryl, aromatic or heteroaromatic moiety.

10. A compound of Formula (IV), or a pharmaceutically acceptable salt thereof:



(IV);

wherein:

R_1 is unsubstituted methyl;

L_a is unsubstituted C_2-C_4 alkyl linker;

R_2 and R_3 are each, independently, H, unsubstituted acyl, $NR_{14}R_{15}$, $C(S)R_{11}$, $C(S)SR_{11}$, $C(S)NR_{11}R_{12}$, $C(S)NR_{11}NR_{13}R_{14}$, $C(NR_{13})NR_{11}R_{12}$, substituted or unsubstituted C_1-C_6 alkyl, substituted or unsubstituted C_2-C_6 alkenyl, substituted or unsubstituted C_2-C_6 alkynyl, substituted or unsubstituted C_6-C_{10} aryl, substituted or unsubstituted C_3-C_{10} carbocycle, substituted or unsubstituted heterocycle comprising one or two 5- or 6-member rings and 1-4 heteroatoms selected from N, O and S, or substituted or unsubstituted heteroaryl comprising one or two 5- or 6-member rings and 1-4 heteroatoms selected from N, O and S;

R_{11} and R_{12} are each, independently, H, substituted or unsubstituted C_1-C_6 alkyl, substituted or unsubstituted C_2-C_6 alkenyl, substituted or unsubstituted C_2-C_6 alkynyl, substituted or unsubstituted C_6-C_{10} aryl, substituted or unsubstituted C_3-C_{10} carbocycle, substituted or unsubstituted heterocycle comprising one or two 5- or 6-member rings and 1-4 heteroatoms selected from N, O and S, or substituted or unsubstituted heteroaryl comprising one or two 5- or 6-member rings and 1-4 heteroatoms selected from N, O and S;

R_{13} is H or substituted or unsubstituted C_1-C_6 alkyl; and

R_{14} and R_{15} are each, independently, H, substituted or unsubstituted acyl, substituted or unsubstituted C_1-C_6 alkyl, substituted or unsubstituted C_2-C_6 alkenyl, substituted or unsubstituted C_2-C_6 alkynyl, substituted or unsubstituted C_6-C_{10} aryl, substituted or unsubstituted C_3-C_{10}

carbocycle, substituted or unsubstituted heterocycle comprising one or two 5- or 6-member rings and 1-4 heteroatoms selected from N, O and S, or substituted or unsubstituted heteroaryl comprising one or two 5- or 6-member rings and 1-4 heteroatoms selected from N, O and S; wherein at least one of R_2 and R_3 is unsubstituted acyl, $NR_{14}R_{15}$, $C(S)R_{11}$, $C(S)SR_{11}$, $C(S)NR_{11}R_{12}$, $C(S)NR_{11}NR_{13}R_{14}$, or $C(NR_{13})NR_{11}R_{12}$,

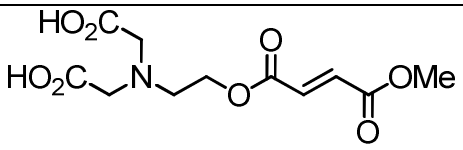
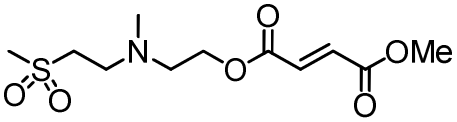
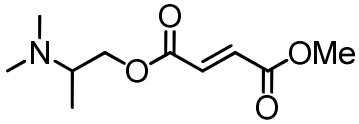
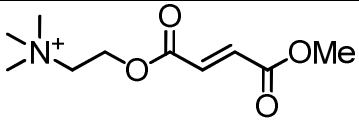
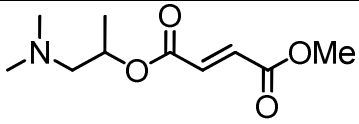
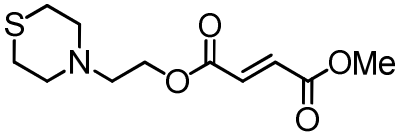
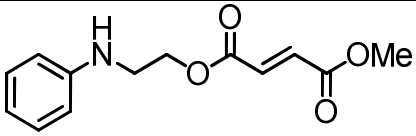
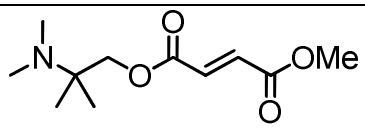
wherein the "substituted" refers to replacing one or more hydrogen atoms in a given structure with a substituent selected from alkyl, alkenyl, alkynyl, halogen, hydroxyl, alkoxy, alkylcarbonyloxy, arylcarbonyloxy, alkoxycarbonyloxy, aryloxycarbonyloxy, carboxylate, alkylcarbonyl, alkylaminocarbonyl, aralkylaminocarbonyl, alkenylaminocarbonyl, dialkylaminocarbonyl, alkylcarbonyl, arylcarbonyl, aralkylcarbonyl, alkenylcarbonyl, alkoxycarbonyl, aminocarbonyl, alkylthiocarbonyl, phosphate, phosphonato, phosphinato, amino, alkylamino, dialkylamino, arylamino, diarylamino, alkylarylamino, acylamino, alkylcarbonylamino, arylcarbonylamino, carbamoyl, ureido, amidino, imino, sulfhydryl, alkylthio, arylthio, thiocarboxylate, sulfates, alkylsulfinyl, sulfonato, sulfamoyl, sulfonamido, nitro, trifluoromethyl, cyano, azido, heterocyclyl, alkylaryl, aromatic or heteroaromatic moiety.

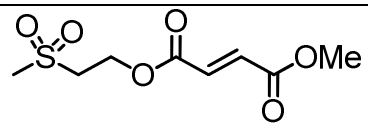
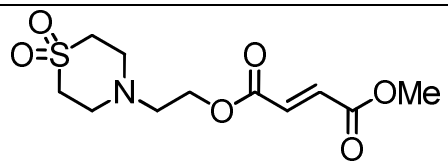
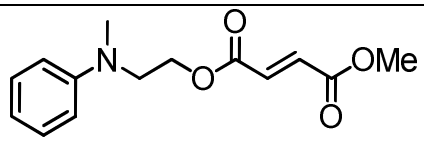
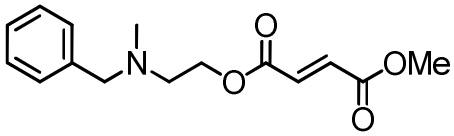
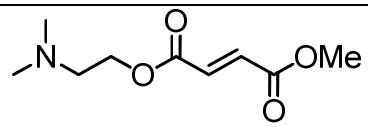
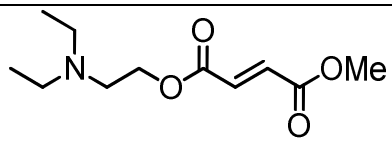
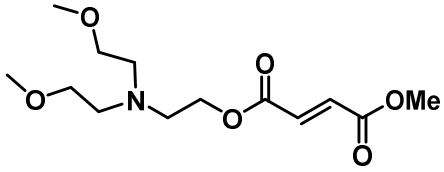
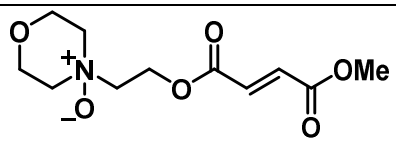
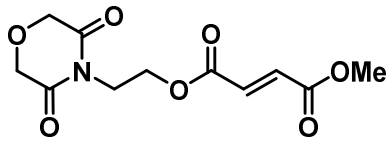
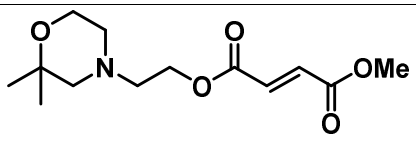
11. The compound according to claim 10 wherein
R_1 is methyl;
L_a is unsubstituted C_2 alkyl linker; and
one of R_2 and R_3 is C(S)NHPh, or $C(NH)NH_2$.

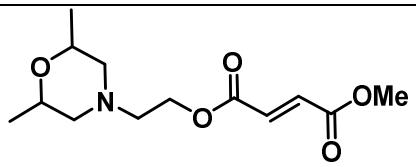
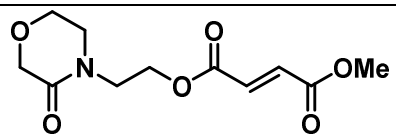
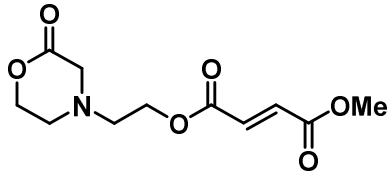
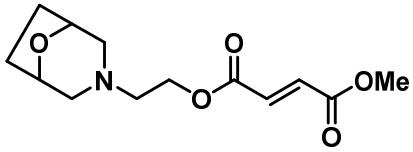
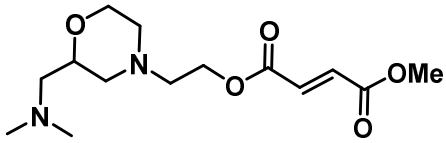
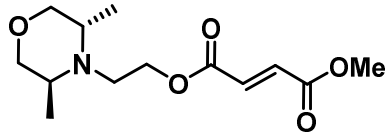
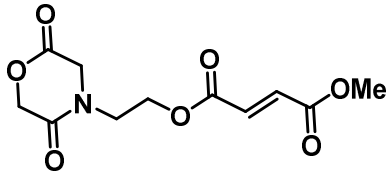
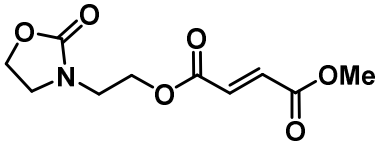
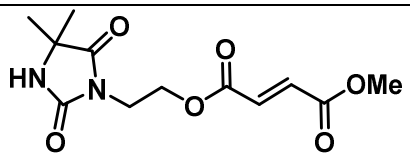
12. The compound according to claim 10 wherein
R_1 is methyl;
L_a is unsubstituted C_2 alkyl linker; and
R_2 is H, methyl, ethyl, isopropyl, butyl, *tert*-butyl, cyclohexyl, cyclohexenyl, phenyl, benzyl, benzodioxole, pyridinyl, $(CH_2)_2N(CH_3)_2$, $(CH_2)_3SO_2H$, $(CH_2)_2SO_2Me$, CHO, CH_2CO_2H, NO, $(CH_2)_2CN$, *tert*-butyl ester, benzyl ester, pyridinyl ester, pyridinyl-*N*-oxide ester, C(S)NHPh, $C(NH)NH_2$, ethyl substituted with carbonyl, propyl substituted with carbonyl, or phenyl ester substituted with NO_2, wherein the phenyl and benzyl groups can be optionally substituted one or more times with methyl, NH_2, NO_2, OH, or CHO;

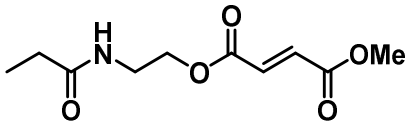
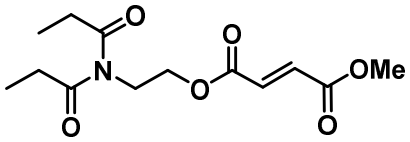
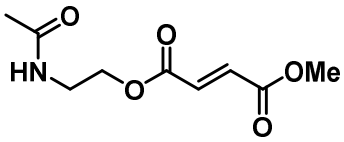
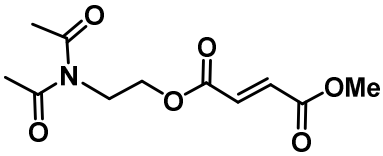
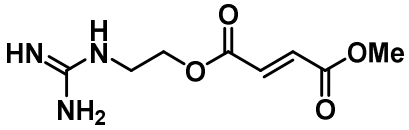
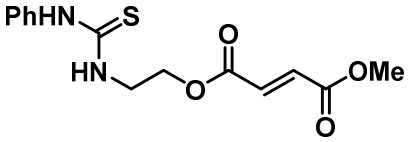
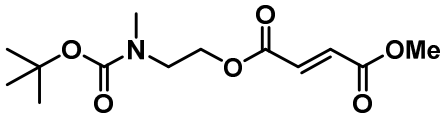
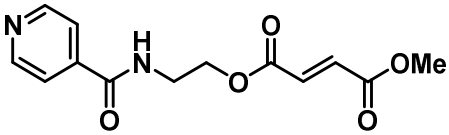
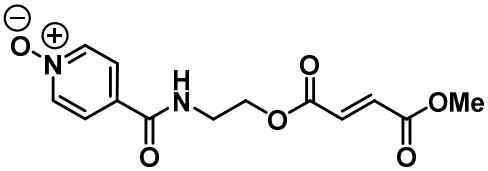
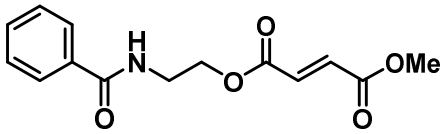
R_3 is methyl, ethyl, isopropyl, butyl, *tert*-butyl, cyclohexyl, cyclohexenyl, phenyl, benzyl, benzodioxole, pyridinyl, $(CH_2)_2N(CH_3)_2$, $(CH_2)_3SO_2H$, $(CH_2)_2SO_2Me$, CHO, CH_2CO_2H, NO, $(CH_2)_2CN$, *tert*-butyl ester, benzyl ester, pyridinyl ester, pyridinyl-*N*-oxide ester, C(S)NHPh, $C(NH)NH_2$, ethyl substituted with carbonyl, propyl substituted with carbonyl, or phenyl ester substituted with NO_2, wherein the phenyl and benzyl groups can be optionally substituted one or more times with methyl, NH_2, NO_2, OH, or CHO.

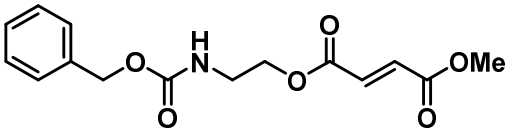
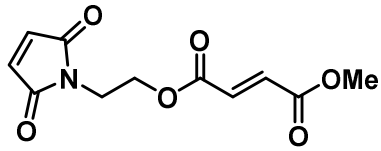
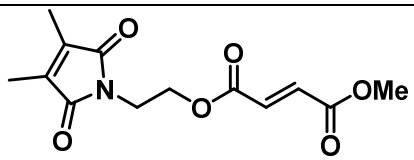
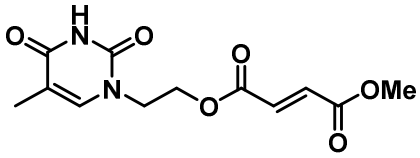
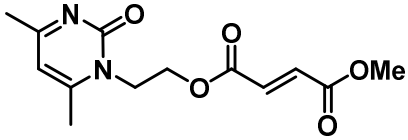
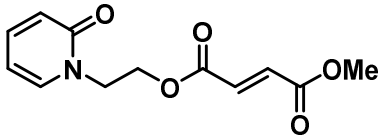
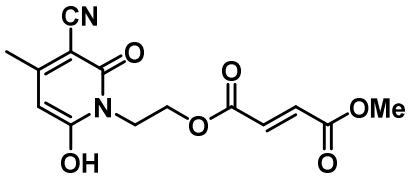
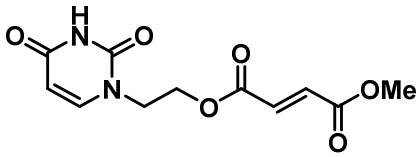
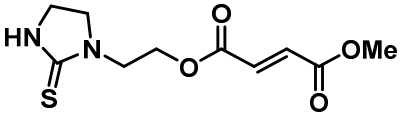
13. A compound selected from the group consisting of:

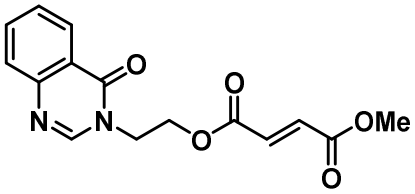
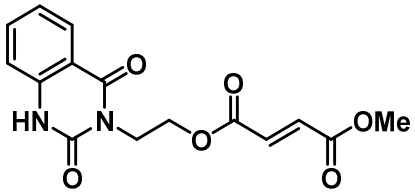
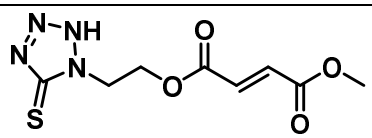
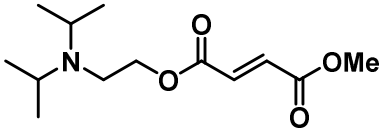
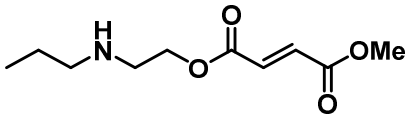
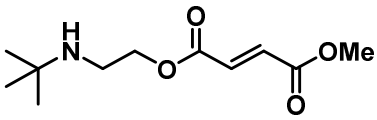
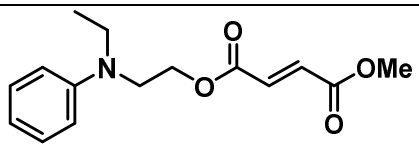
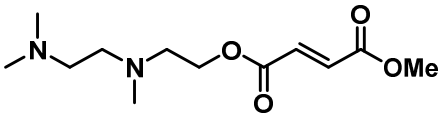
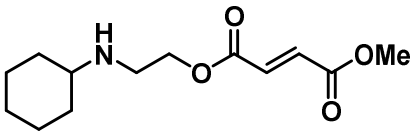
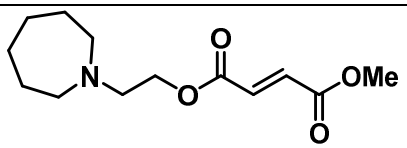
1	
2	
3	
4	 A^-
6	
7	
8	
9	

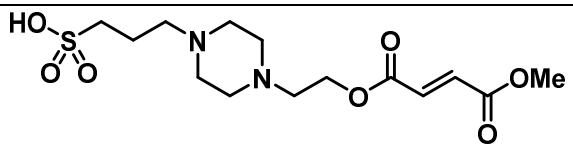
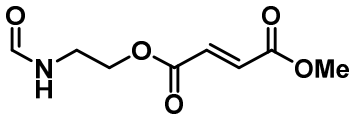
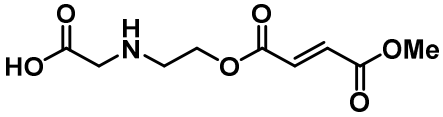
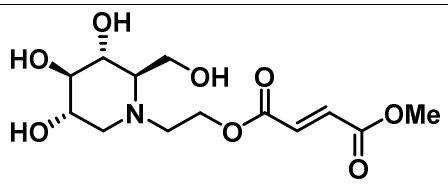
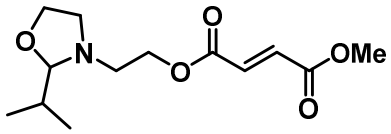
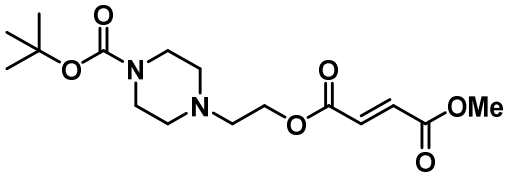
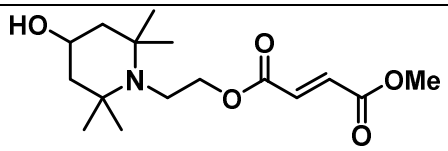
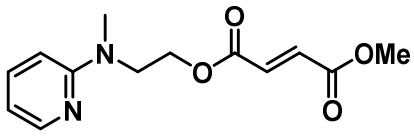
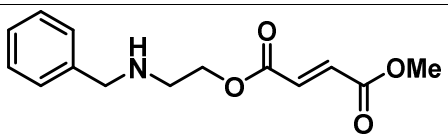
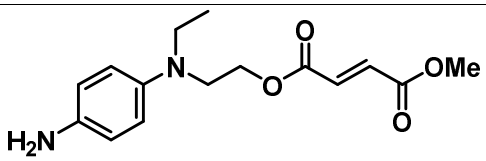
10	
11	
12	
13	
19	
20	
25	
26	
27	
28	

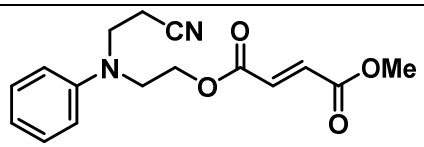
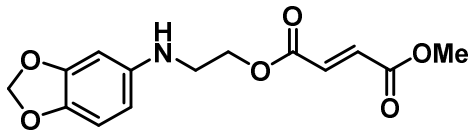
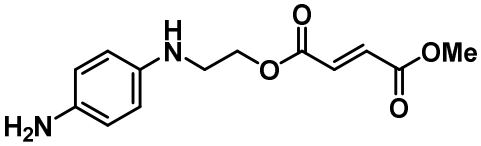
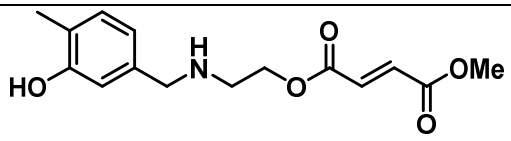
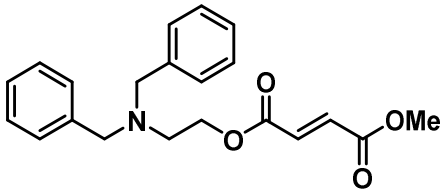
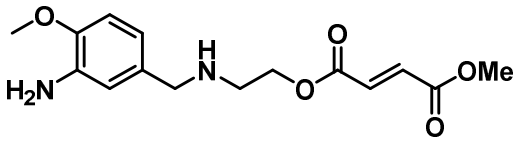
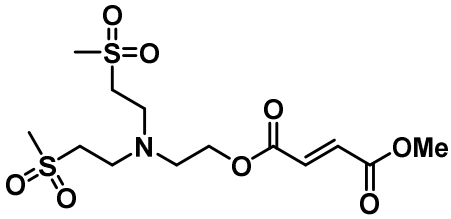
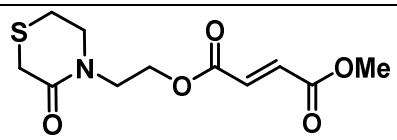
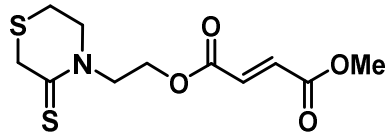
29	
30	
31	
32	
33	
34	
35	
39	
40	

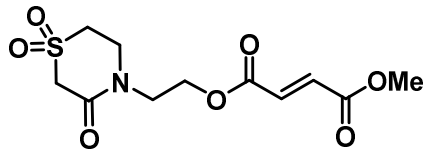
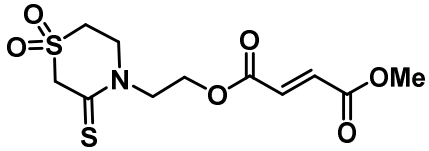
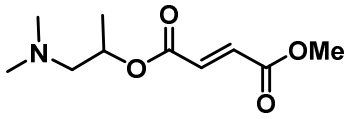
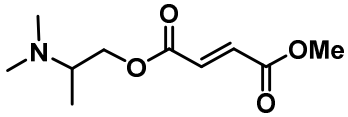
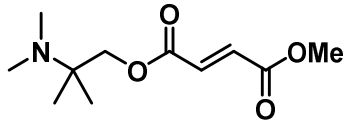
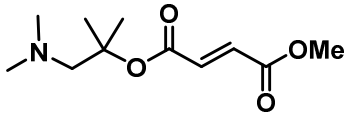
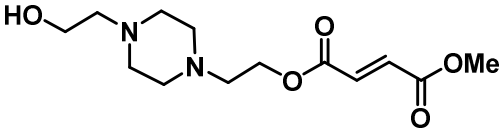
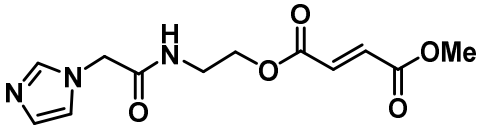
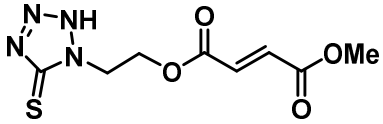
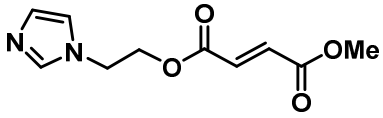
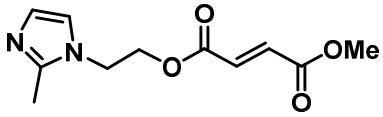
41	
42	
43	
44	
45	
46	
47	
49	
50	
51	

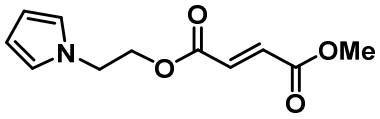
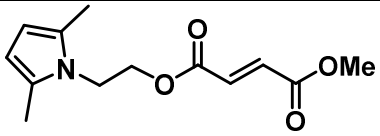
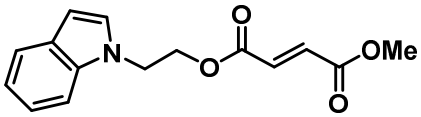
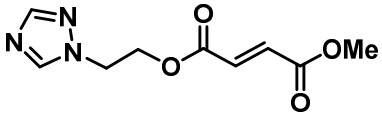
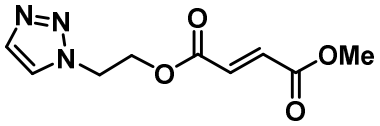
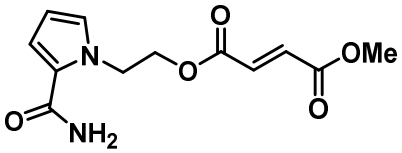
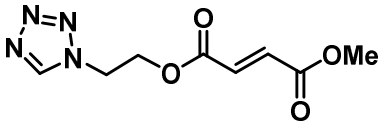
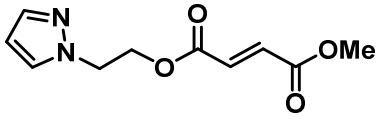
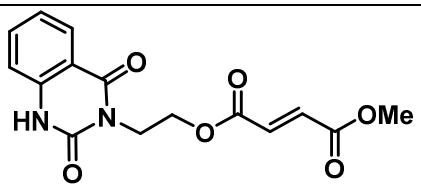
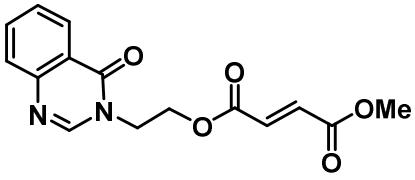
52	
55	
57	
58	
59	
60	
61	
62	
64	

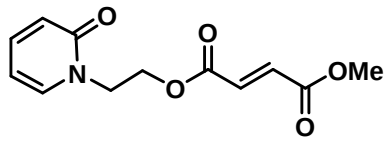
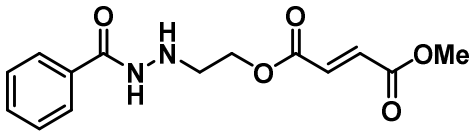
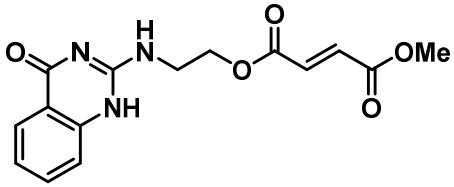
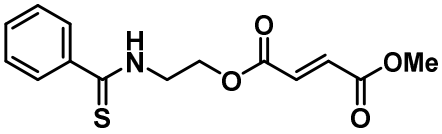
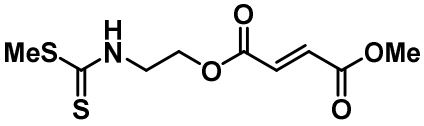
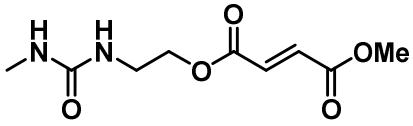
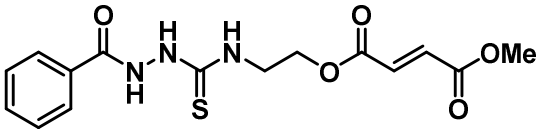
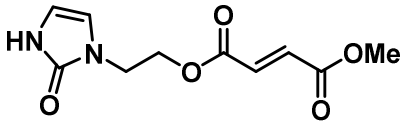
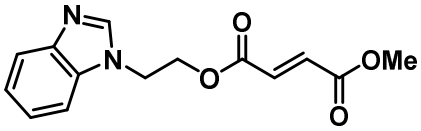
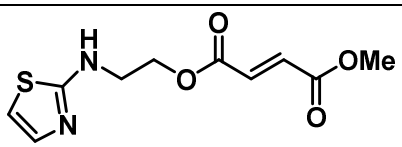
66	
67	
68	
69	
70	
71	
72	
73	
74	
75	

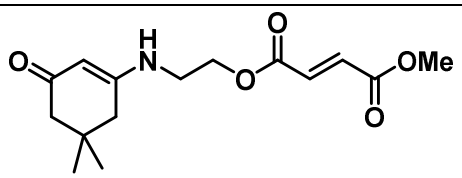
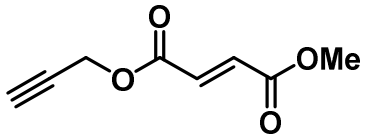
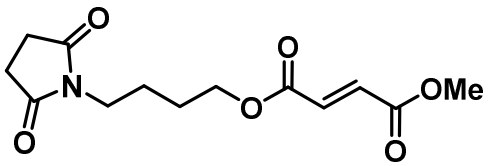
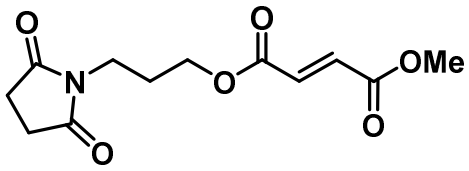
76	
77	
78	
79	
80	
81	
82	
83	
84	
85	

86	
87	
88	
89	
90	
91	
92	
93	
94	

95	
96	
98	
99	
100	
101	
102	
103	
106	
107	
108	

109	
110	
111	
112	
113	
114	
115	
116	
117	
118	

119	
120	
121	
122	
123	
124	
125	
126	
127	
128	

129	
131	
132	
133	

or a pharmaceutically acceptable salt thereof.

14. A composition comprising a compound as defined in any one of claims 1-13, or a pharmaceutically acceptable salt thereof, together with a pharmaceutically acceptable diluent or carrier.

15. Use of a compound as defined in any one of claims 1-13, or a pharmaceutically acceptable salt thereof, or a composition according to claim 14 in the manufacture of a medicament for the treatment of multiple sclerosis.

16. A use according to claim 15, wherein multiple sclerosis is relapsing-remitting multiple sclerosis.