CLAIMS

We claim:

1. Use of an antibody including an Fc region and an effective amount of one association enhancing compound or a plurality of association enhancing compounds capable of activating integrin mediated interactions with their cognate ligands in the manufacture of a medicament for treating cancer,

wherein the antibody is selected from the group consisting of trastuzumab, cetuximab, ipilimumab, nivolumab rituximab, alemtuzumab, atumumab, and/or tositumomab, and

wherein the association enhancing compound or plurality of association enhancing compounds are given by the general **Formula (I)**:

$$\mathbf{R^1 - M^1 - N(R^2) - M^2 - M^3 - M^4 - M^5 - M^6 - R^3} \quad \mathbf{(I)}$$

wherein a first class of the compounds of Formula (I) is defined by:

$\mathbf{R^1}$ is selected from the group consisting of aryl and aralkyl,

$\mathbf{R^2}$ is alkyl, aryl, or aralkyl,

$\mathbf{M^1}$ is CH_2,

$\mathbf{M^2}$ is CO,

$\mathbf{M^3}$ is O, S, or $N\mathbf{R^6}$,

$\mathbf{R^6}$ when present is hydrogen or lower alkyl,

$\mathbf{M^4}$ is absent or CH_2,

$\mathbf{M^5}$ is $(\mathbf{CR^{11}R^{12}})$,

$\mathbf{R^{11}}$ is hydrogen,

$\mathbf{R^{12}}$ is selected from the group consisting of hydrogen, $N\mathbf{R^{21}}CON\mathbf{R^{22}R^{23}}$, $NR^{21}COR^{24}$, $N\mathbf{R^{21}}SO_2\mathbf{R^{24}}$, $N\mathbf{R^{21}}COO\mathbf{R^{24}}$, $OCO\mathbf{R^{24}}$, $O\mathbf{R^{24}}$, $O(CH_2CH_2O)_s\mathbf{R^{24}}$, $COO\mathbf{R^{24}}$, alkyl, and hydroxyalkyl,

s is an integer of 1 to 6,

$\mathbf{R^{21}}$ and $\mathbf{R^{22}}$ when present are independently selected from the group consisting of hydrogen or lower alkyl,

$\mathbf{R^{23}}$ when present is selected from the group consisting of hydroxyalkyl, alkoxyalkyl, alkyl, aryl, aralkyl and alkoxycarbonylalkyl,

provided that when $\mathbf{M^3}$ is $N\mathbf{R^6}$ and $\mathbf{M^4}$ is absent, then $\mathbf{R^{23}}$

is not 1-(1,3-benzodioxol-5-yl)-3-ethoxy-3-oxopropyl,

R^{24} when present is selected from the group consisting of alkyl, aryl, aralkyl, heterocyclyl, cycloalkyl, cycloalkylalkyl, and heterocyclylalkyl, and mixtures or combinations thereof,

M^6 is $(CH_2)_q$,

q is an integer from 0 to 6,

R^3 is selected from the group consisting of hydrogen, $CONR^{13}R^{14}$, $NR^{15}COOR^{16}$, $NR^{15}COR^{16}$, $NR^{15}CONR^{13}R^{14}$, $NR^{15}SO_2R^{16}$, $OCOR^{16}$, $COOR^{16}$, OR^{16}, SR^{16}, heterocyclyl, hydroxyl, hydroxyalkyl, guanadino, alkyl and aryl,

R^{13} and **R^{15}** when present are independently hydrogen or lower alkyl,

R^{14} and **R^{16}** when present are independently selected from the group consisting of hydrogen, alkyl, aryl, aralkyl, cycloalkyl, heterocyclyl, cycloalkylalkyl, and heterocyclylalkyl,

R^1, **R^2**, **R^3**, **R^{12}**, **R^{14}**, **R^{16}**, **R^{23}** and **R^{24}** when present may independently be either unsubstituted or substituted with one or more substituents selected from the group consisting of alkyl, aryl, aralkyl, cycloalkyl, cycloalkylalkyl, heterocyclyl, heterocyclylalkyl, heterocyclylaryl, hydroxy, alkoxy, azido, haloalkoxy, hydroxyalkyl, aryloxy, hydroxyaryl, alkoxyaryl, halo, haloalkyl, haloaryl, amino, alkylamino, dialkylamino, arylamino, diarylamino, –NHCO(alkyl), –NHCO(aryl), –NHCO(aralkyl), –NHCO(haloalkyl), $–NHSO_2$(alkyl), $–NHSO_2$(aryl), $–NHSO_2$(aralkyl), alkoxycarbonyl, alkoxycarbonylalkyl, –OCO(alkylamino), –OCO(dialkylamino), and mixtures or combinations thereof, or

wherein a second class of the compounds of Formula (I) is defined by:

R^1 is aryl or aralkyl,

R^2 is alkyl or aralkyl,

M^1 is CH_2,

M^2 is CO,

M^3 is absent or is O or CH_2,

M^4 is absent or is CH_2,

M^5 is absent or is O or $(CR^{11}R^{12})$,

R^{11} is hydrogen,

$\mathbf{R^{12}}$ is selected from the group consisting of hydrogen, $N\mathbf{R^{21}}CON\mathbf{R^{22}R^{23}}$, $N\mathbf{R^{21}}CO\mathbf{R^{24}}$, $N\mathbf{R^{21}}SO_2\mathbf{R^{24}}$ and $\mathbf{NR^{21}COOR^{24}}$,

$\mathbf{R^{21}}$ and $\mathbf{R^{22}}$ each of which, when present is independently selected from the group of hydrogen and lower alkyl,

$\mathbf{R^{23}}$ and $\mathbf{R^{24}}$, each of which, when present is independently selected from the group consisting of hydrogen, alkyl, aryl, cycloalkyl, cycloalkylalkyl, heterocyclyl, heterocyclylalkyl and aralkyl,

$\mathbf{M^6}$ is selected from the group consisting of $(CH_2)_q$, $(CH_2)_q$–CH=CH–$(CH_2)_r$, $(CH_2)_q$–arylene–$(CH_2)_r$ and $(CH_2CH_2O)_q$,

q and **r** are independently integers from 0 to 6,

$\mathbf{R^3}$ is $CON\mathbf{R^{13}R^{14}}$,

$\mathbf{R^{13}}$ and $\mathbf{R^{14}}$, each of which, when present is independently selected from the group consisting of hydrogen, alkyl, aryl, cycloalkyl, cycloalkylalkyl, heterocyclyl, heterocyclylalkyl and aralkyl, and

$\mathbf{R^1}$, $\mathbf{R^2}$, $\mathbf{R^{13}}$, $\mathbf{R^{14}}$, $\mathbf{R^{23}}$ and $\mathbf{R^{24}}$ when present may be either unsubstituted or substituted with one or more substituents selected from the group consisting of alkyl, aryl, aralkyl, cycloalkyl, cycloalkylalkyl, heterocyclyl, heterocyclylalkyl, heterocyclylaryl, hydroxy, alkoxy, azido, haloalkoxy, hydroxyalkyl, aryloxy, hydroxyaryl, alkoxyaryl, halo, haloalkyl, haloaryl, amino, alkylamino, dialkylamino, arylamino, diarylamino, –NHCO(alkyl), –NHCO(aryl), –NHCO(aralkyl), –NHCO(haloalkyl), –$NHSO_2$(alkyl), –$NHSO_2$(aryl), –$NHSO_2$(aralkyl), alkoxycarbonyl, alkoxycarbonylalkyl, –OCO(alkylamino), –OCO(dialkylamino), and mixtures or combinations thereof, or

wherein a third class of the compounds of Formula (I) is defined by:

$\mathbf{R^1}$ is aryl or aralkyl,

$\mathbf{R^2}$ is alkyl or aralkyl,

$\mathbf{M^1}$ is CH_2,

$\mathbf{M^2}$ is SO_2 or CO,

$\mathbf{M^3}$ is absent or is CH_2,

$\mathbf{M^4}$ is absent or is CH_2,

$\mathbf{M^5}$ is absent or is $(C\mathbf{R^{11}R^{12}})$,

$\mathbf{R^{11}}$, when present, is hydrogen,

$\mathbf{R^{12}}$, when present, is selected from the group consisting of hydrogen, alkyl, N$\mathbf{R^{21}}$CON$\mathbf{R^{22}R^{23}}$, N$\mathbf{R^{21}}$CO$\mathbf{R^{24}}$, N$\mathbf{R^{21}}$SO$_2$$\mathbf{R^{24}}$ and N$\mathbf{R^{21}}$COO$\mathbf{R^{24}}$,

$\mathbf{R^{21}}$ and $\mathbf{R^{22}}$, each of which when present, is independently selected from the group of hydrogen, lower alkyl, and aralkyl,

$\mathbf{R^{23}}$ and $\mathbf{R^{24}}$, each of which, when present is independently selected from the group consisting of hydrogen, alkyl, aryl, cycloalkyl, cycloalkylalkyl, heterocyclyl, heterocyclylalkyl and aralkyl,

$\mathbf{M^6}$ is $(CH_2)_q$, or N$\mathbf{R^{34}}$$(CH_2)_q$,

q is an integer from 0 to 6,

$\mathbf{R^{34}}$, when present, is selected form the group consisting of alkyl, aralkyl, CO$\mathbf{R^{35}}$, and SO$_2$$\mathbf{R^{35}}$,

$\mathbf{R^{35}}$ when present, is selected form the group consisting of alkyl, aryl, and aralkyl, and

$\mathbf{R^3}$ is selected from the group consisting of CON$\mathbf{R^{13}R^{14}}$, SO$_2$N$\mathbf{R^{13}R^{14}}$, N$\mathbf{R^{15}}$COO$\mathbf{R^{16}}$, N$\mathbf{R^{15}}$CO$\mathbf{R^{16}}$, N$\mathbf{R^{15}}$CON$\mathbf{R^{13}R^{14}}$, and N$\mathbf{R^{15}}$SO$_2$$\mathbf{R^{16}}$,

$\mathbf{R^{13}}$ and $\mathbf{R^{14}}$, each of which, when present is independently selected from the group consisting of hydrogen, alkyl, aryl, cycloalkyl, cycloalkylalkyl, heterocyclyl, heterocyclylalkyl and aralkyl,

$\mathbf{R^{15}}$ and $\mathbf{R^{16}}$, each of which when present, is independently selected from the group of hydrogen, lower alkyl, and aralkyl,

$\mathbf{R^1}$, $\mathbf{R^2}$, $\mathbf{R^{13}}$, $\mathbf{R^{14}}$, $\mathbf{R^{15}}$, $\mathbf{R^{16}}$, $\mathbf{R^{23}}$, $\mathbf{R^{24}}$, $\mathbf{R^{34}}$ and $\mathbf{R^{35}}$, when present, may be either unsubstituted or substituted with one or more substituents selected from the group consisting of alkyl, aryl, aralkyl, cycloalkyl, cycloalkylalkyl, heterocyclyl, heterocyclylalkyl, heterocyclylaryl, hydroxy, alkoxy, azido, haloalkoxy, hydroxyalkyl, aryloxy, hydroxyaryl, alkoxyaryl, halo, haloalkyl, haloaryl, amino, alkylamino, dialkylamino, arylamino, diarylamino, –NHCO(alkyl), –NHCO(aryl), –NHCO(aralkyl), –NHCO(haloalkyl), –NHSO$_2$(alkyl), –NHSO$_2$(aryl), –NHSO$_2$(aralkyl), alkoxycarbonyl, alkoxycarbonylalkyl, –OCO(alkylamino), and –OCO(dialkylamino),

with the proviso that when $\mathbf{M^2}$ is CO, then $\mathbf{M^6}$ is N$\mathbf{R^{34}}$$(CH_2)_q$, wherein **q** is not

0.

2. Use of an antigen and an effective amount of one association enhancing compound or a plurality of association enhancing compounds in the manufacture of a medicament for treating cancer,

wherein the antigen includes a purified protein, peptide, cell, and/or cell lysate,

wherein the association enhancing compounds are (a) capable of enhancing integrin-mediated binding of integrins of a cell to their respective ligand, (b) the integrins include α4β1, α4β7, α5β1, and/or αLβ2, and (c) the ligands include VCAM-1, fibronectin, MAdCAM-1, ICAM-1, and/or ICAM-2, and

wherein the association enhancing compound or a plurality of enhancing compounds are given by the general **Formula (I)**:

$$\mathbf{R^1 - M^1 - N(R^2) - M^2 - M^3 - M^4 - M^5 - M^6 - R^3} \quad \mathbf{(I)}$$

wherein a first class of the compounds of Formula (I) is defined by:

$\mathbf{R^1}$ is selected from the group consisting of aryl and aralkyl,

$\mathbf{R^2}$ is alkyl, aryl, or aralkyl,

$\mathbf{M^1}$ is CH_2,

$\mathbf{M^2}$ is CO,

$\mathbf{M^3}$ is O, S, or $N\mathbf{R^6}$,

$\mathbf{R^6}$ when present is hydrogen or lower alkyl,

$\mathbf{M^4}$ is absent or CH_2,

$\mathbf{M^5}$ is $(\mathbf{CR^{11}R^{12}})$,

$\mathbf{R^{11}}$ is hydrogen,

$\mathbf{R^{12}}$ is selected from the group consisting of hydrogen, $N\mathbf{R^{21}}CON\mathbf{R^{22}R^{23}}$, $NR^{21}COR^{24}$, $N\mathbf{R^{21}}SO_2\mathbf{R^{24}}$, $N\mathbf{R^{21}}COO\mathbf{R^{24}}$, $OCO\mathbf{R^{24}}$, $O\mathbf{R^{24}}$, $O(CH_2CH_2O)_s\mathbf{R^{24}}$, $COO\mathbf{R^{24}}$, alkyl, and hydroxyalkyl,

s is an integer of 1 to 6,

$\mathbf{R^{21}}$ and $\mathbf{R^{22}}$ when present are independently selected from the group consisting of hydrogen or lower alkyl,

$\mathbf{R^{23}}$ when present is selected from the group consisting of hydroxyalkyl, alkoxyalkyl, alkyl, aryl, aralkyl and alkoxycarbonylalkyl,

provided that when **M³** is N**R⁶** and **M⁴** is absent, then **R²³** is not 1-(1,3-benzodioxol-5-yl)-3-ethoxy-3-oxopropyl,

R²⁴ when present is selected from the group consisting of alkyl, aryl, aralkyl, heterocyclyl, cycloalkyl, cycloalkylalkyl, and heterocyclylalkyl, and mixtures or combinations thereof,

M⁶ is $(CH_2)_q$,

q is an integer from 0 to 6,

R³ is selected from the group consisting of hydrogen, CON**R¹³R¹⁴**, N**R¹⁵**COO**R¹⁶**, N**R¹⁵**CO**R¹⁶**, N**R¹⁵**CON**R¹³R¹⁴**, N**R¹⁵**SO_2**R¹⁶**, OCO**R¹⁶**, COO**R¹⁶**, O**R¹⁶**, S**R¹⁶**, heterocyclyl, hydroxyl, hydroxyalkyl, guanadino, alkyl and aryl,

R¹³ and **R¹⁵** when present are independently hydrogen or lower alkyl,

R¹⁴ and **R¹⁶** when present are independently selected from the group consisting of hydrogen, alkyl, aryl, aralkyl, cycloalkyl, heterocyclyl, cycloalkylalkyl, and heterocyclylalkyl,

R¹, **R²**, **R³**, **R¹²**, **R¹⁴**, **R¹⁶**, **R²³** and **R²⁴** when present may independently be either unsubstituted or substituted with one or more substituents selected from the group consisting of alkyl, aryl, aralkyl, cycloalkyl, cycloalkylalkyl, heterocyclyl, heterocyclylalkyl, heterocyclylaryl, hydroxy, alkoxy, azido, haloalkoxy, hydroxyalkyl, aryloxy, hydroxyaryl, alkoxyaryl, halo, haloalkyl, haloaryl, amino, alkylamino, dialkylamino, arylamino, diarylamino, –NHCO(alkyl), –NHCO(aryl), –NHCO(aralkyl), –NHCO(haloalkyl), –$NHSO_2$(alkyl), –$NHSO_2$(aryl), –$NHSO_2$(aralkyl), alkoxycarbonyl, alkoxycarbonylalkyl, –OCO(alkylamino), –OCO(dialkylamino), and mixtures or combinations thereof, or

wherein a second class of the compounds of Formula (I) is defined by:

R¹ is aryl or aralkyl,

R² is alkyl or aralkyl,

M¹ is CH_2,

M² is CO,

M³ is absent or is O or CH_2,

M⁴ is absent or is CH_2,

M⁵ is absent or is O or (C**R¹¹R¹²**),

$\mathbf{R^{11}}$ is hydrogen,

$\mathbf{R^{12}}$ is selected from the group consisting of hydrogen, $N\mathbf{R^{21}}CON\mathbf{R^{22}R^{23}}$, $N\mathbf{R^{21}}CO\mathbf{R^{24}}$, $N\mathbf{R^{21}}SO_2\mathbf{R^{24}}$ and $\mathbf{NR^{21}COOR^{24}}$,

$\mathbf{R^{21}}$ and $\mathbf{R^{22}}$ each of which, when present is independently selected from the group of hydrogen and lower alkyl,

$\mathbf{R^{23}}$ and $\mathbf{R^{24}}$, each of which, when present is independently selected from the group consisting of hydrogen, alkyl, aryl, cycloalkyl, cycloalkylalkyl, heterocyclyl, heterocyclylalkyl and aralkyl,

$\mathbf{M^6}$ is selected from the group consisting of $(CH_2)_q$, $(CH_2)_q$–CH=CH–$(CH_2)_r$, $(CH_2)_q$–arylene–$(CH_2)_r$ and $(CH_2CH_2O)_q$,

q and **r** are independently integers from 0 to 6,

$\mathbf{R^3}$ is $CON\mathbf{R^{13}R^{14}}$,

$\mathbf{R^{13}}$ and $\mathbf{R^{14}}$, each of which, when present is independently selected from the group consisting of hydrogen, alkyl, aryl, cycloalkyl, cycloalkylalkyl, heterocyclyl, heterocyclylalkyl and aralkyl, and

$\mathbf{R^1}$, $\mathbf{R^2}$, $\mathbf{R^{13}}$, $\mathbf{R^{14}}$, $\mathbf{R^{23}}$ and $\mathbf{R^{24}}$ when present may be either unsubstituted or substituted with one or more substituents selected from the group consisting of alkyl, aryl, aralkyl, cycloalkyl, cycloalkylalkyl, heterocyclyl, heterocyclylalkyl, heterocyclylaryl, hydroxy, alkoxy, azido, haloalkoxy, hydroxyalkyl, aryloxy, hydroxyaryl, alkoxyaryl, halo, haloalkyl, haloaryl, amino, alkylamino, dialkylamino, arylamino, diarylamino, –NHCO(alkyl), –NHCO(aryl), –NHCO(aralkyl), –NHCO(haloalkyl), –$NHSO_2$(alkyl), –$NHSO_2$(aryl), –$NHSO_2$(aralkyl), alkoxycarbonyl, alkoxycarbonylalkyl, –OCO(alkylamino), –OCO(dialkylamino), and mixtures or combinations thereof, or

wherein a third class of the compounds of Formula (I) is defined by:

$\mathbf{R^1}$ is aryl or aralkyl,

$\mathbf{R^2}$ is alkyl or aralkyl,

$\mathbf{M^1}$ is CH_2,

$\mathbf{M^2}$ is SO_2 or CO,

$\mathbf{M^3}$ is absent or is CH_2,

$\mathbf{M^4}$ is absent or is CH_2,

M^5 is absent or is ($CR^{11}R^{12}$),

R^{11}, when present, is hydrogen,

R^{12}, when present, is selected from the group consisting of hydrogen, alkyl, $NR^{21}CONR^{22}R^{23}$, $NR^{21}COR^{24}$, $NR^{21}SO_2R^{24}$ and $NR^{21}COOR^{24}$,

R^{21} and R^{22}, each of which when present, is independently selected from the group of hydrogen, lower alkyl, and aralkyl,

R^{23} and R^{24}, each of which, when present is independently selected from the group consisting of hydrogen, alkyl, aryl, cycloalkyl, cycloalkylalkyl, heterocyclyl, heterocyclylalkyl and aralkyl,

M^6 is $(CH_2)_q$, or $NR^{34}(CH_2)_q$,

q is an integer from 0 to 6,

R^{34}, when present, is selected form the group consisting of alkyl, aralkyl, COR^{35}, and SO_2R^{35},

R^{35} when present, is selected form the group consisting of alkyl, aryl, and aralkyl, and

R^3 is selected from the group consisting of $CONR^{13}R^{14}$, $SO_2NR^{13}R^{14}$, $NR^{15}COOR^{16}$, $NR^{15}COR^{16}$, $NR^{15}CONR^{13}R^{14}$, and $NR^{15}SO_2R^{16}$,

R^{13} and R^{14}, each of which, when present is independently selected from the group consisting of hydrogen, alkyl, aryl, cycloalkyl, cycloalkylalkyl, heterocyclyl, heterocyclylalkyl and aralkyl,

R^{15} and R^{16}, each of which when present, is independently selected from the group of hydrogen, lower alkyl, and aralkyl,

R^1, R^2, R^{13}, R^{14}, R^{15}, R^{16}, R^{23}, R^{24}, R^{34} and R^{35}, when present, may be either unsubstituted or substituted with one or more substituents selected from the group consisting of alkyl, aryl, aralkyl, cycloalkyl, cycloalkylalkyl, heterocyclyl, heterocyclylalkyl, heterocyclylaryl, hydroxy, alkoxy, azido, haloalkoxy, hydroxyalkyl, aryloxy, hydroxyaryl, alkoxyaryl, halo, haloalkyl, haloaryl, amino, alkylamino, dialkylamino, arylamino, diarylamino, –NHCO(alkyl), –NHCO(aryl), –NHCO(aralkyl), –NHCO(haloalkyl), $–NHSO_2$(alkyl), $–NHSO_2$(aryl), $–NHSO_2$(aralkyl), alkoxycarbonyl, alkoxycarbonylalkyl, –OCO(alkylamino), and –OCO(dialkylamino),

with the proviso that when **M^2** is CO, then **M^6** is $NR^{34}(CH_2)_q$, wherein **q** is not 0.

3. The use according to claim 2, wherein the medicament further comprises:

an adjuvant comprising a non-specific adjuvant substance and/or a specific adjuvant substance, where the substances are capable of eliciting an immune response in response to the antigen.

4. The use according to claim 3, wherein:

the non-specific adjuvant substance is selected from the group consisting of bacillus calmette–guérin (BCG), complete freund's adjuvant, alum, and/or noscapine, and

the specific adjuvant substance is selected from the group consisting of G-CSF, FGF, Toll-like receptor agonists, and/or immune checkpoint inhibitors.

5. The use according to claim 4, wherein the immune checkpoint inhibitors target proteins selected from the group consisting of CTL-4, PD-1, PDL-1, and/or IDO-1.

6. Use of cells treated with an effective amount of one association enhancing compound or a plurality of association enhancing compounds capable of activating integrin mediated interactions with their cognate ligands in the manufacture of a medicament for treating cancer,

wherein the cells are natural killer (NK) cells, activated NK cells, invariant natural killer T (iNKT) cells, activated iNKT cells, engineered NK cells, engineered iNKT cells, or iNKT cell lines and

wherein the association enhancing compound or a plurality of association enhancing compounds are given by the general **Formula (I)**:

$$\mathbf{R^1 - M^1 - N(R^2) - M^2 - M^3 - M^4 - M^5 - M^6 - R^3} \quad \mathbf{(I)}$$

wherein a first class of the compounds of Formula (I) is defined by:

R^1 is selected from the group consisting of aryl and aralkyl,

R^2 is alkyl, aryl, or aralkyl,

M^1 is CH_2,

M^2 is CO,

$\mathbf{M^3}$ is O, S, or $N\mathbf{R^6}$,

$\mathbf{R^6}$ when present is hydrogen or lower alkyl,

$\mathbf{M^4}$ is absent or CH_2,

$\mathbf{M^5}$ is $(\mathbf{CR^{11}R^{12}})$,

$\mathbf{R^{11}}$ is hydrogen,

$\mathbf{R^{12}}$ is selected from the group consisting of hydrogen, $N\mathbf{R^{21}}CON\mathbf{R^{22}R^{23}}$, $NR^{21}COR^{24}$, $N\mathbf{R^{21}}SO_2\mathbf{R^{24}}$, $N\mathbf{R^{21}}COO\mathbf{R^{24}}$, $OCO\mathbf{R^{24}}$, $O\mathbf{R^{24}}$, $O(CH_2CH_2O)_s\mathbf{R^{24}}$, $COO\mathbf{R^{24}}$, alkyl, and hydroxyalkyl,

s is an integer of 1 to 6,

$\mathbf{R^{21}}$ and $\mathbf{R^{22}}$ when present are independently selected from the group consisting of hydrogen or lower alkyl,

$\mathbf{R^{23}}$ when present is selected from the group consisting of hydroxyalkyl, alkoxyalkyl, alkyl, aryl, aralkyl and alkoxycarbonylalkyl,

provided that when $\mathbf{M^3}$ is $N\mathbf{R^6}$ and $\mathbf{M^4}$ is absent, then $\mathbf{R^{23}}$ is not 1-(1,3-benzodioxol-5-yl)-3-ethoxy-3-oxopropyl,

$\mathbf{R^{24}}$ when present is selected from the group consisting of alkyl, aryl, aralkyl, heterocyclyl, cycloalkyl, cycloalkylalkyl, and heterocyclylalkyl, and mixtures or combinations thereof,

$\mathbf{M^6}$ is $(CH_2)_q$,

q is an integer from 0 to 6,

$\mathbf{R^3}$ is selected from the group consisting of hydrogen, $CON\mathbf{R^{13}R^{14}}$, $N\mathbf{R^{15}}COO\mathbf{R^{16}}$, $N\mathbf{R^{15}}CO\mathbf{R^{16}}$, $N\mathbf{R^{15}}CON\mathbf{R^{13}R^{14}}$, $N\mathbf{R^{15}}SO_2\mathbf{R^{16}}$, $OCO\mathbf{R^{16}}$, $COO\mathbf{R^{16}}$, $O\mathbf{R^{16}}$, $S\mathbf{R^{16}}$, heterocyclyl, hydroxyl, hydroxyalkyl, guanadino, alkyl and aryl,

$\mathbf{R^{13}}$ and $\mathbf{R^{15}}$ when present are independently hydrogen or lower alkyl,

$\mathbf{R^{14}}$ and $\mathbf{R^{16}}$ when present are independently selected from the group consisting of hydrogen, alkyl, aryl, aralkyl, cycloalkyl, heterocyclyl, cycloalkylalkyl, and heterocyclylalkyl,

$\mathbf{R^1}$, $\mathbf{R^2}$, $\mathbf{R^3}$, $\mathbf{R^{12}}$, $\mathbf{R^{14}}$, $\mathbf{R^{16}}$, $\mathbf{R^{23}}$ and $\mathbf{R^{24}}$ when present may independently be either unsubstituted or substituted with one or more substituents selected from the group consisting of alkyl, aryl, aralkyl, cycloalkyl, cycloalkylalkyl, heterocyclyl, heterocyclylalkyl, heterocyclylaryl, hydroxy, alkoxy, azido, haloalkoxy,

hydroxyalkyl, aryloxy, hydroxyaryl, alkoxyaryl, halo, haloalkyl, haloaryl, amino, alkylamino, dialkylamino, arylamino, diarylamino, –NHCO(alkyl), –NHCO(aryl), –NHCO(aralkyl), –NHCO(haloalkyl), –$NHSO_2$(alkyl), –$NHSO_2$(aryl), –$NHSO_2$(aralkyl), alkoxycarbonyl, alkoxycarbonylalkyl, –OCO(alkylamino), –OCO(dialkylamino), and mixtures or combinations thereof, or

wherein a second class of the compounds of Formula (I) is defined by:

R^1 is aryl or aralkyl,

R^2 is alkyl or aralkyl,

M^1 is CH_2,

M^2 is CO,

M^3 is absent or is O or CH_2,

M^4 is absent or is CH_2,

M^5 is absent or is O or ($CR^{11}R^{12}$),

R^{11} is hydrogen,

R^{12} is selected from the group consisting of hydrogen, $NR^{21}CONR^{22}R^{23}$, $NR^{21}COR^{24}$, $NR^{21}SO_2R^{24}$ and $NR^{21}COOR^{24}$,

R^{21} and **R^{22}** each of which, when present is independently selected from the group of hydrogen and lower alkyl,

R^{23} and **R^{24}**, each of which, when present is independently selected from the group consisting of hydrogen, alkyl, aryl, cycloalkyl, cycloalkylalkyl, heterocyclyl, heterocyclylalkyl and aralkyl,

M^6 is selected from the group consisting of $(CH_2)_q$, $(CH_2)_q$–CH=CH–$(CH_2)_r$, $(CH_2)_q$–arylene–$(CH_2)_r$ and $(CH_2CH_2O)_q$,

q and **r** are independently integers from 0 to 6,

R^3 is $CONR^{13}R^{14}$,

R^{13} and **R^{14}**, each of which, when present is independently selected from the group consisting of hydrogen, alkyl, aryl, cycloalkyl, cycloalkylalkyl, heterocyclyl, heterocyclylalkyl and aralkyl, and

R^1, **R^2**, **R^{13}**, **R^{14}**, **R^{23}** and **R^{24}** when present may be either unsubstituted or substituted with one or more substituents selected from the group consisting of

alkyl, aryl, aralkyl, cycloalkyl, cycloalkylalkyl, heterocyclyl, heterocyclylalkyl, heterocyclylaryl, hydroxy, alkoxy, azido, haloalkoxy, hydroxyalkyl, aryloxy, hydroxyaryl, alkoxyaryl, halo, haloalkyl, haloaryl, amino, alkylamino, dialkylamino, arylamino, diarylamino, –NHCO(alkyl), –NHCO(aryl), –NHCO(aralkyl), –NHCO(haloalkyl), –$NHSO_2$(alkyl), –$NHSO_2$(aryl), –$NHSO_2$(aralkyl), alkoxycarbonyl, alkoxycarbonylalkyl, –OCO(alkylamino), –OCO(dialkylamino), and mixtures or combinations thereof, or

wherein a third class of the compounds of Formula (I) is defined by:

$\mathbf{R^1}$ is aryl or aralkyl,

$\mathbf{R^2}$ is alkyl or aralkyl,

$\mathbf{M^1}$ is CH_2,

$\mathbf{M^2}$ is SO_2 or CO,

$\mathbf{M^3}$ is absent or is CH_2,

$\mathbf{M^4}$ is absent or is CH_2,

$\mathbf{M^5}$ is absent or is ($C\mathbf{R^{11}R^{12}}$),

$\mathbf{R^{11}}$, when present, is hydrogen,

$\mathbf{R^{12}}$, when present, is selected from the group consisting of hydrogen, alkyl, $N\mathbf{R^{21}}CON\mathbf{R^{22}R^{23}}$, $N\mathbf{R^{21}}CO\mathbf{R^{24}}$, $N\mathbf{R^{21}}SO_2\mathbf{R^{24}}$ and $N\mathbf{R^{21}}COO\mathbf{R^{24}}$,

$\mathbf{R^{21}}$ and $\mathbf{R^{22}}$, each of which when present, is independently selected from the group of hydrogen, lower alkyl, and aralkyl,

$\mathbf{R^{23}}$ and $\mathbf{R^{24}}$, each of which, when present is independently selected from the group consisting of hydrogen, alkyl, aryl, cycloalkyl, cycloalkylalkyl, heterocyclyl, heterocyclylalkyl and aralkyl,

$\mathbf{M^6}$ is $(CH_2)_q$, or $N\mathbf{R^{34}}(CH_2)_q$,

q is an integer from 0 to 6,

$\mathbf{R^{34}}$, when present, is selected form the group consisting of alkyl, aralkyl, $CO\mathbf{R^{35}}$, and $SO_2\mathbf{R^{35}}$,

$\mathbf{R^{35}}$ when present, is selected form the group consisting of alkyl, aryl, and aralkyl, and

$\mathbf{R^3}$ is selected from the group consisting of $CON\mathbf{R^{13}R^{14}}$, $SO_2N\mathbf{R^{13}R^{14}}$, $N\mathbf{R^{15}}COO\mathbf{R^{16}}$, $N\mathbf{R^{15}}CO\mathbf{R^{16}}$, $N\mathbf{R^{15}}CON\mathbf{R^{13}R^{14}}$, and $N\mathbf{R^{15}}SO_2\mathbf{R^{16}}$,

$\mathbf{R^{13}}$ and $\mathbf{R^{14}}$, each of which, when present is independently selected from the group consisting of hydrogen, alkyl, aryl, cycloalkyl, cycloalkylalkyl, heterocyclyl, heterocyclylalkyl and aralkyl,

$\mathbf{R^{15}}$ and $\mathbf{R^{16}}$, each of which when present, is independently selected from the group of hydrogen, lower alkyl, and aralkyl,

$\mathbf{R^1}$, $\mathbf{R^2}$, $\mathbf{R^{13}}$, $\mathbf{R^{14}}$, $\mathbf{R^{15}}$, $\mathbf{R^{16}}$, $\mathbf{R^{23}}$, $\mathbf{R^{24}}$, $\mathbf{R^{34}}$ and $\mathbf{R^{35}}$, when present, may be either unsubstituted or substituted with one or more substituents selected from the group consisting of alkyl, aryl, aralkyl, cycloalkyl, cycloalkylalkyl, heterocyclyl, heterocyclylalkyl, heterocyclylaryl, hydroxy, alkoxy, azido, haloalkoxy, hydroxyalkyl, aryloxy, hydroxyaryl, alkoxyaryl, halo, haloalkyl, haloaryl, amino, alkylamino, dialkylamino, arylamino, diarylamino, –NHCO(alkyl), –NHCO(aryl), –NHCO(aralkyl), –NHCO(haloalkyl), –$NHSO_2$(alkyl), –$NHSO_2$(aryl), –$NHSO_2$(aralkyl), alkoxycarbonyl, alkoxycarbonylalkyl, –OCO(alkylamino), and –OCO(dialkylamino),

with the proviso that when $\mathbf{M^2}$ is CO, then $\mathbf{M^6}$ is $N\mathbf{R^{34}}(CH_2)_q$, wherein **q** is not 0, and

wherein the effective amount is between 1 fM and 10 μM.

7. The use according to any one of claims 1 to 5, wherein the effective amount is between 1 fM and 10 μM.

8. The use according to any one of claims 1 to 7, wherein the association enhancing compound is or the association enhancing compounds are selected from the group consisting of:

methyl(6S,10S)-10-(1,3-benzodioxol-5-yl)-6-butyl-3,8-dioxo-1-(2-thienyl)-2-(2-thienylmethyl)-4-oxa-2,7,9-triazadodecan-12-oate;

methyl(6S,10R)-10-(1,3-benzodioxol-5-yl)-6-butyl-3,8-dioxo-1-(2-thienyl)-2-(2-thienylmethyl)-4-oxa-2,7,9-triazadodecan-12-oate;

methyl(6S,10S)-10-(1,3-benzodioxol-5-yl)-6-butyl-7-methyl-3,8-dioxo-1-(2-thienyl)-2-(2-thienylmethyl)-4-oxa-2,7,9-triazadodecan-12-oate;

methyl(6S,10S)-10-(1,3-benzodioxol-5-yl)-6-butyl-9-methyl-3,8-dioxo-1-(2-thienyl)-2-(2-thienyl)-2-(2-thienylmethyl)-4-oxa-2,7,9-triazadodecan-12-oate;

ethyl(6S,10R)-10-(1,3-benzodioxol-5-yl)-6-butyl-7-methyl-3,8-dioxo-1-(2-thienyl)-2-(2-thienylmethyl)-4-oxa-2,7,9-triazadodecan-12-oate;

methyl(10S)-10-(1,3-benzodioxol-5-yl)-3,8-dioxo-1-(2-thienyl)-2-(2-thienylmethyl)-4-oxa-2,7,9-triazadodecan-12-oate;

methyl-3,8-dioxo-1-(2-thienyl)-2-(2-thienylmethyl)-4-oxa-2,7,9-triazadodecan-12-oate;

methyl(6S,10S)-10-(1,3-benzodioxol-5-yl)-6-butyl-2-methyl-3,8-dioxo-1-(2-thienyl)-4-oxa-2,7,9-triazadodecan-12-oate;

methyl(6S)-6-butyl-3,8-dioxo-1-(2-thienyl)-2-(2-thienylmethyl)-4-oxa-2,7,9-triazadodecan-12-oate;

(2S)-2-{[(1,3-benzodioxol-5-ylmethyl)carbamoyl]amino}hexyl-bis(2-thienylmethyl)carbamate;

methyl(6S,10S)-6-butyl-3,8-dioxo-10-phenyl-1-(2-thienyl)-2-(2-thienylmethyl)-4-oxa-2,7,9-triazadodecan-12-oate;

(2S)-2-({[(1S)-1-(1,3-benzodioxol-5-yl)-3-hydroxypropyl]carbamoyl}amino)hexyl-bis(2-thienylmethyl)carbamate;

(2S)-2-[(benzylcarbamoyl)amino]hexyl-bis(2-thienylmethyl)carbamate;

(2S)-2-[(morpholin-4-ylcarbonyl)amino]hexyl-bis(2-thienylmethyl)carbamate;

(2S)-2-{[(3-methoxypropyl)carbamoyl]amino}hexyl-bis(2-thienylmethyl)carbamate;

(2S)-2-{[(2-methoxyethyl)carbamoyl]amino}hexyl-bis(2-thienylmethyl)carbamate;

tert-butyl[(2S)-1-{[bis(2-thienylmethyl)carbamoyl]oxy}hexan-2-yl]carbamate;

(2S)-2-[(tert-butylcarbamoyl)amino]hexyl-bis(2-thienylmethyl)carbamate;

(2S)-2-[(isopropylcarbamoyl)amino]hexyl-bis(2-thienylmethyl)carbamate;

(2S)-2-[(methylcarbamoyl)amino]hexyl-bis(2-thienylmethyl)carbamate;

tert-butyl[(2R)-1-{[bis(2-thienylmethyl)carbamoyl]oxy}hexan-2-yl]carbamate;

benzyl{(5S)-6-{[bis(2-thienylmethyl)carbamoyl]oxy}-5-[(tert-butoxycarbonyl)amino]hexyl}carbamate;

methyl(9S,13S)-13-(1,3-benzodioxol-5-yl)-9-({[bis(2-thienylmethyl)carbamoyl]oxy}methyl)-3,11-dioxo-1-phenyl-2-oxa-4,10,12-triazapentadecan-15-oate;

(2S)-2-acetamidohexyl bis(2-thienylmethyl)carbamate;

methyl(3R)-3-(1,3-benzodioxol-5-yl)-3-{[(2S)-2-{[bis(2-thienylmethyl)carbamoyl]amino}hexanoyl]amino}propanoate;

methyl(3R)-3-(1,3-benzodioxol-5-yl)-3-{[(2R)-2-{[bis(2-thienylmethyl)carbamoyl]amino}hexanoyl]amino}propanoate;

methyl(3S)-3-(1,3-benzodioxol-5-yl)-3-{[(2R)-2-{[bis(2-thienylmethyl)carbamoyl]amino}hexanoyl]amino}propanoate;

methyl(6R,10S)-10-(1,3-benzodioxol-5-yl)-6-butyl-3,8-dioxo-1-(2-thienyl)-2-(2-thienylmethyl)-4-oxa-2,7,9-triazadodecan-12-oate;

methyl(6R,10R)-10-(1,3-benzodioxol-5-yl)-6-butyl-3,8-dioxo-1-(2-thienyl)-2-(2-thienylmethyl)-4-oxa-2,7,9-triazadodecan-12-oate;

methyl(2S)-2-{[bis(2-thienylmethyl)-carbamoyl]amino}hexanoate;

methyl(2R)-2-{[bis(2-thienylmethyl)carbamoyl]amino}hexanoate;

3-[(2S)-1-hydroxyhexan-2-yl]-1,1-bis(2-thienylmethyl)urea;

3-[(2R)-1-hydroxyhexan-2-yl]-1,1-bis(2-thienylmethyl)urea;

methyl(2S)-6-{[(benzyloxy)carbonyl]amino}-2-{[bis(2-thienylmethyl)carbamoyl]amino}hexanoate;

methyl{[bis(2-thienylmethyl)carbamoyl](methyl)amino}acetate;

methyl{[bis(2-thienylmethyl)carbamoyl]amino}acetate;

methyl{[bis(2-thienylmethyl)carbamoyl](butyl)amino}acetate;

3-(3-hydroxypropyl)-1,1-bis(2-thienylmethyl)urea;

methyl(2R)-{[bis(2-thienylmethyl)carbamoyl]amino}(phenyl)acetate;

tert-butyl{[bis(2-thienylmethyl)carbamoyl]amino}acetate;

tert-butyl{[bis(2-thienylmethyl)carbamoyl](butyl)amino}acetate;

benzyl{(5S)-6-{[bis(4-methoxybenzyl)carbamoyl]oxy}-5-[(tert-butoxycarbonyl)amino]hexyl}carbamate;

tert-butyl[(2S)-1-{[bis(4-methoxybenzyl)carbamoyl]oxy}hexan-2-yl]carbamate;

methyl(6S,10S)-10-(1,3-benzodioxol-5-yl)-6-butyl-2-(4-methoxybenzyl)-1-(4-methoxyphenyl)-3,8-dioxo-4-oxa-2,7,9-triazadodecan-12-oate;

(2S)-2-({[(1S)-1-(1,3-benzodioxol-5-yl)-3-hydroxypropyl]carbamoyl}amino)hexyl-bis(4-methoxybenzyl)carbamate;

(2S)-2-[(tert-butoxycarbonyl)amino]hexyl dibenzylcarbamate;

methyl(6S,10S)-10-(1,3-benzodioxol-5-yl)-2-benzyl-6-butyl-3,8-dioxo-1-phenyl-4-oxa-2,7,9-triazadodecan-12-oate;

tert-butyl[(2S)-1-{[bis(4-methylbenzyl)carbamoyl]oxy}hexan-2-yl]carbamate;

methyl(6S,10S)-10-(1,3-benzodioxol-5-yl)-6-butyl-2-(4-methylbenzyl)-1-(4-methylphenyl)-3,8-dioxo-4-oxa-2,7,9-triazadodecan-12-oate;

tert-butyl[(2S)-1-{[bis(4-chlorobenzyl)carbamoyl]oxy}hexan-2-yl]carbamate;

methyl(6S,10S)-10-(1,3-benzodioxol-5-yl)-6-butyl-2-(4-chlorobenzyl)-1-(4-chlorophenyl)-3,8-dioxo-4-oxa-2,7,9-triazadodecan-12-oate;

(2S)-2-[(tert-butoxycarbonyl)amino]hexyl(4-bromobenzyl)(2-thienylmethyl)carbamate;

methyl(6S,10S)-10-(1,3-benzodioxol-5-yl)-2-(4-bromobenzyl)-6-but-yl-3,8-dioxo-1-(2-thienyl)-4-oxa-2,7,9-triazadodecan-12-oate;

methyl(6S,10S)-2-(4-azidoobenzyl)-10-(1,3-benzodioxol-5-yl)-6-butyl-3,8-dioxo-1-(2-thienyl)-4-oxa-2,7,9-triazadodecan-12-oate;

(2S)-2-[(tert-butoxycarbonyl)amino]hexylphenyl(2-thienylmethyl)carbamate;

methyl(6S,100S)-10-(1,3-benzodioxol-5-yl)-6-butyl-3,8-dioxo-2-phenyl-1-(2-thienyl)-4-oxa-2,7,9-triazadodecan-12-oate;

tert-butyl[(2S)-1-{[bis(3-thienylmethyl)carbamoyl]oxy}hexan-2-yl]carbamate;

methyl(6S,10S)-10-(1,3-benzodioxol-5-yl)-6-butyl-3,8-dioxo-1-(3-thienyl)-2-(3-thienylmethyl)-4-oxa-2,7,9-triazadodecan-12-oate;

benzyl[(5S)-5-[(tert-butoxycarbonyl)amino]-6-{[butyl(2-thienylmethyl)carbamoyl]oxy}hexyl]carbamate;

(2S)-2-[(tert-butoxycarbonyl)amino]hexyl butyl(2-thienylmethyl)carbamate;

methyl(3S,7S)-3-(1,3-benzodioxol-5-yl)-7-butyl-5,10-dioxo-[1-(2-thienylmethyl)-9-oxa-4,6,11-triazapentadecan-1-oate;

benzyl[(5S)-5-[(tert-butoxycarbonyl)amino]-6-{[(2-methoxyethyl)(2-thienyl-methyl)carbamoyl]oxy}hexyl]carbamate;

(2S)-2-[(tert-butoxycarbonyl)amino]hexyl(2-methoxyethyl)(2-thienylmethyl)carbamate;

methyl(9S,13S)-13-(1,3-benzodioxol-5-yl)-9-butyl-6,11-dioxo-5-(-2-thienylmethyl)-2,7-dioxa-5,10,12-triazapentadecan-15-oate;

(2S)-2-[({3-[(methylsulfonyl)amino]benzyl}carbamoyl)amino]hexyl(2-methoxyethyl)(2-thienylmethyl)carbamate;

(2S)-2-{[(4-bromobenzyl)carbamoyl]amino}hexyl-bis(2-thienylmethyl)carbamate;

(2S)-2-{[(4-azidobenzyl)carbamoyl]amino}hexyl-bis(2-thienylmethyl)carbamate;

tert-butyl[(2S)-1-{[bis(2-thienylmethyl)carbamoyl]thio}hexan-2-yl]carbamate;

methyl(6S,10S)-10-(1,3-benzodioxol-5-yl)-6-butyl-3,8-dioxo-1-(2-thienyl)-2-(2-thienylmethyl)-4-thia-2,7,9-triazadodecan-12-oate; and

mixtures or combinations thereof

9. The use according to any one of claims 1 to 7, wherein the association enhancing compound is or the association enhancing compounds are selected from the group consisting of:

N,N,N',N'-tetrakis(2-thienylmethyl)pentanediamide;

N-(3-methoxybenzyl)-N,N',N'-tris(2-thienylmethyl)pentanediamide;

N,N,N'-tris(2-thienylmethyl)pentanediamide;

N'-[2-(2-thienyl)ethyl]-N,N-bis(2-thienylmethyl)pentanediamide;

N-[2-(2-thienyl)ethyl]-N,N',N'-tris(2-thienylmethyl)pentanediamide;

N,N-bis(pyridin-4-ylmethyl)-N',N'-bis(2-thienylmethyl)pentanediamide;

N,N-bis(pyridin-3-ylmethyl)-N',N'-bis(2-thienylmethyl)pentanediamide;

N,N-bis(3-methoxybenzyl)-N',N'-bis(2-thienylmethyl)pentanediamide;

N,N,N',N'-tetrakis(4-methoxybenzyl)pentanediamide;

N,N,N',N'-tetrakis(2-thienylmethyl)hexanediamide;

N,N,N',N'-tetrakis(4-methoxybenzyl)hexanediamide;

N,N,N',N'-tetrakis(3-methoxybenzyl) hexanediamide;

N,N,N',N'-tetrakis(2-thienylmethyl)heptanediamide;

2,2'-(1,3-phenylene)bis[N,N-bis(2-thienylmethyl)acetamide];

N,N,N',N'-tetrakis(4-methoxybenzyl)heptanediamide;

N,N,N',N'-tetrakis(2-thienylmethyl)octanediamide;

(3E)-N,N,N',N'-tetrakis(2-thienylmethyl) hex-3-enediamide;

2,2'-oxybis[N,N-bis(2-thienylmethyl)acetamide];

3-oxo-1-(2-thienyl)-2-(2-thienylmethyl)-4,7,10-trioxa-2-azadodecan-12-yl bis(2-thienylmethyl)carbamate;

N,N,N',N'-tetrakis(4-methoxybenzyl)succinamideethane-1,2-diyl bis[bis(2-thienylmethyl)carbamate];

N,N,N',N'-tetrakis(4-methoxybenzyl)octanediamide; N,N,N',N'-tetrakis(2-thienylmethyl)pyridine-3,5-dicarboxamide;

N,N,N',N'-tetrakis(2-thienylmethyl) pyridine-2,6-dicarboxamide; N,N,N',N'-tetrakis(2-thienylmethyl)pyridine-2,4-dicarboxamide;

2,2'-(1,4-phenylene)bis[N,N-bis(2-thienylmethyl)acetamide];

8-{2-[bis(2-thienylmethyl)amino]-2-oxoethoxy}-N,N-bis(2-thienylmethyl)quinoline-2-carboxamide;

N,N'-bis(4-methoxybenzyl)-N,N'-bis(2-thienylmethyl)hexanediamide;

tert-butyl{(2S)-1,6-bis[bis(2-thienylmethyl)amino]-1,6-dioxohexan-2-yl}carbamate; and

mixtures or combinations thereof.

10. The use according to any one of claims 1 to 7, wherein the association enhancing compound is or the association enhancing compounds are selected from the group consisting of:

N-{2-[bis(2-thienylmethyl)sulfamoyl]ethyl}-N-(2-thienylmethyl)thiophene-2-sulfonamide;

N-{2-[bis(2-thienylmethyl)sulfamoyl]ethyl}-N-(2-thienylmethyl)thiophene-2-carboxamide;

2-{butyl[(2-thienylmethyl)carbamoyl]amino}-N,N-bis(2-thienylmethyl)ethanesulfonamide;

2-{[bis(2-thienylmethyl)carbamoyl](butyl)amino}-N,N-bis(2-thienylmethyl)ethanesulfonamide;

N-{3-[bis(2-thienylmethyl)sulfamoyl]propyl}-N-(2-thienylmethyl)thiophene-2-sulfonamide;

2-[(methylsulfonyl)(2-thienylmethyl)amino]-N,N-bis(2-thienylmethyl)ethanesulfonamide;

2-{[bis(2-thienylmethyl)carbamoyl]amino}-N,N-bis(2-thienylmethyl)ethanesulfonamide;

N-{2-[bis(2-thienylmethyl)sulfamoyl]ethyl}thiophene-2-sulfonamide;

N-{2-[bis(2-thienylmethyl)sulfamoyl]ethyl}-2-(2-thienyl)acetamide;

N-{2-[bis(2-thienylmethyl)sulfamoyl]ethyl}thiophene-2-carboxamide;

N,N-bis(2-thienylmethyl)-2-{[(2-thienylmethyl)carbamoyl]amino}ethanesulfonamide;

2-({2-[bis(2-thienylmethyl)sulfamoyl]ethyl}amino)-N,N-bis(2-thienylmethyl)acetamide;

3-[{2-[bis(2-thienylmethyl)amino]-2-oxoethyl}(butyl)amino]-N,N-bis(2-thienylmethyl)propanamide;

2-[{2-[bis(2-thienylmethyl)sulfamoyl]ethyl}(methyl)amino]-N,N-bis(2-thienylmethyl)acetamide;

2-[{2-[bis(2-thienylmethyl)sulfamoyl]ethyl}(butyl)amino]-N,N-bis(2-thienylmethyl)acetamide;

3-({2-[bis(2-thienylmethyl)sulfamoyl]ethyl}amino)-N,N-bis(2-thienylmethyl)propanamide;

3-({2-[bis(2-thienylmethyl)sulfamoyl]ethyl}amino)-N,N-bis(4-methoxybenzyl)propanamide;

3-({2-[bis(4-methoxybenzyl)sulfamoyl]ethyl}amino)-N,N-bis(2-thienylmethyl)propanamide;

3-[{2-[bis(2-thienylmethyl)sulfamoyl]ethyl}(methyl)amino]-N,N-bis(2-thienylmethyl)propanamide;

3-[{2-[bis(4-methoxybenzyl)sulfamoyl]ethyl}(methyl)amino]-N,N-bis(2-thienylmethyl)propanamide;

(2S)-2-({2-[bis(2-thienylmethyl)sulfamoyl]ethyl}amino)-N,N-bis(2-thienylmethyl)hexanamide;

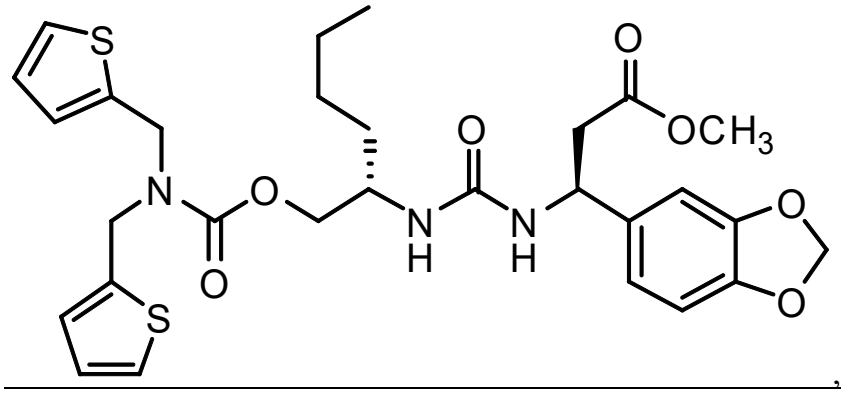
(2S)-2-({2-[bis(4-methoxybenzyl)sulfamoyl]ethyl}amino)-N,N-bis(2-thienylmethyl)hexanamide;

2-(acetyl{2-[bis(2-thienylmethyl)sulfamoyl]ethyl}amino)-N,N-bis(2-thienylmethyl)acetamide;

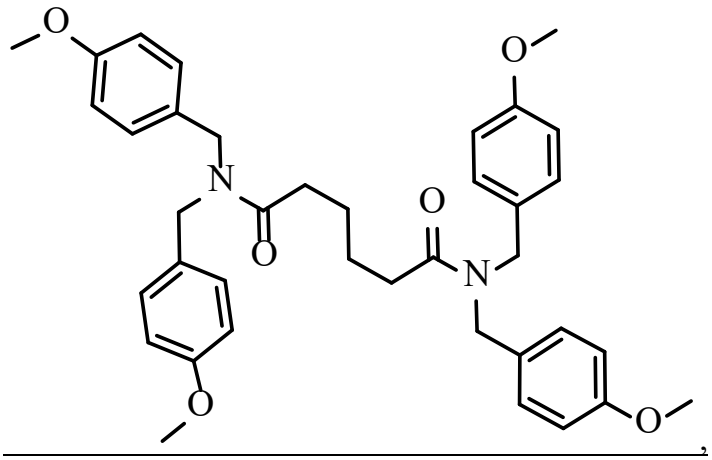
2-(acetyl{2-[bis(4-methoxybenzyl)sulfamoyl]ethyl}amino)-N,N-bis(2-thienylmethyl)acetamide; and

mixtures or combinations thereof.

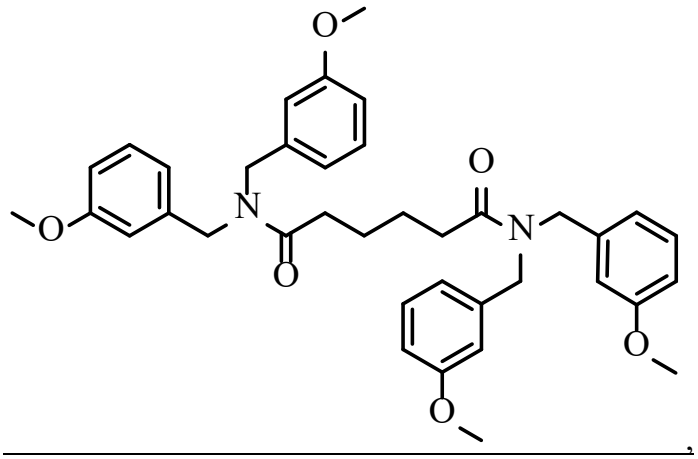
11. The use according to any one of claims 1 to 7, wherein the association enhancing compound is or the association enhancing compounds are selected from the group consisting of:

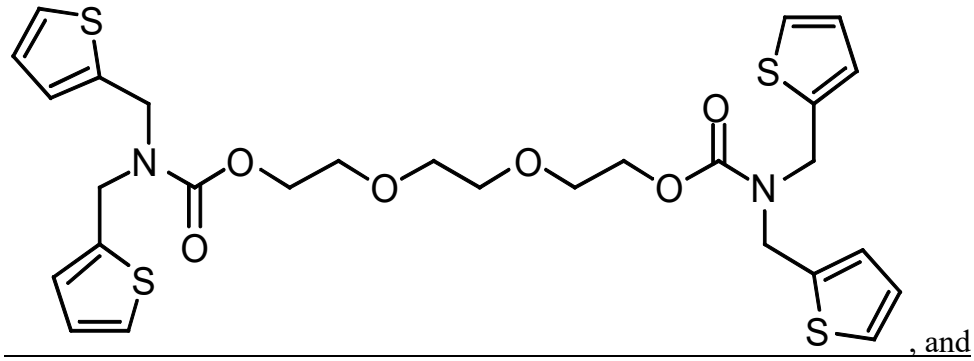


,



,





, and

mixtures or combinations thereof.

~~1. A vaccine preparation comprising:~~

~~an antigen including a purified protein, peptide, cell, and/or cell lysate, and~~

~~an effective amount of one enhancing compound or a plurality of enhancing compounds,~~

~~where (a) the associated enhancing compounds are capable of enhancing integrin-mediated binding of integrins of a cell to their respective ligand, (b) the integrins include α4β1, α4β7, α5β1, and/or αI.β2, and (c) the ligands include VCAM-1, fibronectin, MAdCAM-1, ICAM-1, and/or ICAM-2.~~

~~2. The vaccine preparation of claim 1, wherein the preparation is an anti-cancer vaccine.~~

~~3. The vaccine preparation of claim 1, further comprising:~~

an adjuvant comprising a non-specific adjuvant substance and/or a specific adjuvant substance, where the substances are capable of eliciting an immune response in response to the antigen.

4. The vaccine preparation of claim 3, wherein:

the non-specific adjuvant substance is selected from the group consisting of bacillus calmette-guérin (BCG), complete freund's adjuvant, alum, and/or noscapine, and

the specific adjuvant substance is selected from the group consisting of G-CSF, FGF, Toll-like receptor agonists, and/or immune checkpoint inhibitors.

5. The vaccine preparation of claim 4, wherein the immune checkpoint inhibitors target proteins selected from the group consisting of CTL-4, PD-1, PDL-1, and/or IDO-1.

6. The vaccine preparation of claim 1, wherein the enhancing compound comprises or compounds comprise a compound or compounds of the general Formula (I):

$R^1-M^1-N(R^2)-M^2-M^3-M^4-M^5-M^6-R^3$ (I)

where:

R^1 is selected from the group consisting of aryl and aralkyl,

R^2 is alkyl, aryl, or aralkyl,

M^1 is CH_2,

M^2 is CO,

M^3 is O, S, or NR^6, where R^6 when present is hydrogen or lower alkyl,

M^4 is absent or CH_2,

M^5 is $(CR^{11}R^{12})$, where R^{11} is hydrogen, R^{12} is selected from the group consisting of hydrogen, $NR^{21}CONR^{22}R^{23}$, $NR^{21}COR^{24}$, $NR^{21}SO_2R^{24}$, $NR^{21}COOR^{24}$, $OCOR^{24}$, OR^{24}, $O(CH_2CH_2O)_sR^{24}$, $COOR^{24}$, alkyl, and hydroxyalkyl, where s is an integer of 1 to 6, R^{21} and R^{22} when present are independently selected from the group consisting of hydrogen or lower alkyl, R^{23} when present is selected from the group consisting of hydroxyalkyl, alkoxyalkyl, alkyl, aryl, aralkyl and alkoxycarbonylalkyl, provided that when M^3 is NR^6, M^4 is absent, and R^{12} is $CONR^{22}R^{23}$, then R^{23} is not 1-

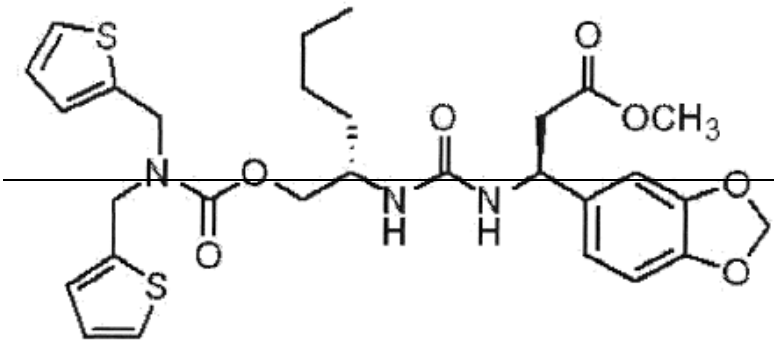
(1,3-benzodioxol-5-yl)-3-ethoxy-3-oxopropyl, R^{24} when present is selected from the group consisting of alkyl, aryl, aralkyl, heterocyclyl, cycloalkyl, cycloalkylalkyl, and heterocyclylalkyl,

M^6 is $(CH_2)_q$, wherein q is an integer from 0 to 6,

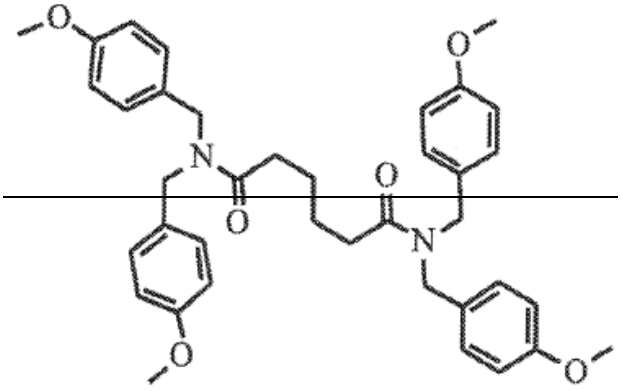
R^3 is selected from the group consisting of hydrogen, $CONR^{13}R^{14}$, $NR^{15}COOR^{16}$, $NR^{15}COR^{16}$, $NR^{15}CONR^{13}R^{14}$, $NR^{15}SO_2R^{16}$, $OCOR^{16}$, $COOR^{16}$, OR^{16}, SR^{16}, heterocyclyl, hydroxyl, hydroxyalkyl, guanadino, alkyl and aryl, where R^{13} and R^{15} when present are independently hydrogen or lower alkyl, R^{14} and R^{16} when present are independently selected from the group consisting of hydrogen, alkyl, aryl, aralkyl, cycloalkyl, heterocyclyl, cycloalkylalkyl, and heterocyclylalkyl,

R^1, R^2, R^3, R^{12}, R^{14}, R^{16}, R^{23} and R^{24} when present may independently be either unsubstituted or substituted with one or more substituents selected from the group consisting of alkyl, aryl, aralkyl, cycloalkyl, cycloalkylalkyl, heterocyclyl, heterocyclylalkyl, heterocyclylaryl, hydroxy, alkoxy, azido, haloalkoxy, hydroxyalkyl, aryloxy, hydroxyaryl, alkoxyaryl, halo, haloalkyl, haloaryl, amino, alkylamino, dialkylamino, arylamino, diarylamino, -NHCO(alkyl), -NHCO(aryl), -NHCO(aralkyl), -NHCO(haloalkyl), $-NHSO_2$(alkyl), $-NHSO_2$(aryl), $-NHSO_2$(aralkyl), alkoxycarbonyl, alkoxycarbonylalkyl, -OCO(alkylamino), and -OCO(dialkylamino).

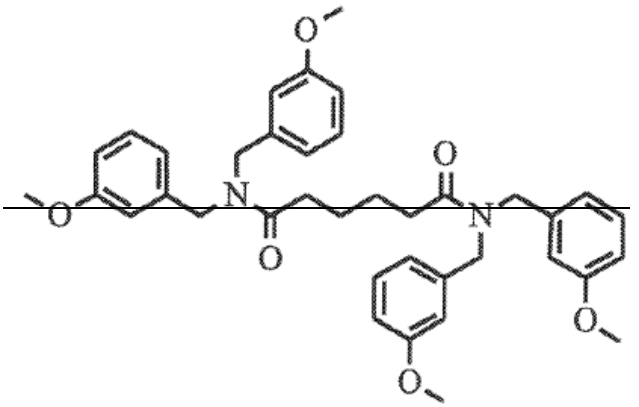
7. The vaccine preparation of claim 1, wherein the enhancing compound is or the enhancing compounds are selected from the group consisting of:



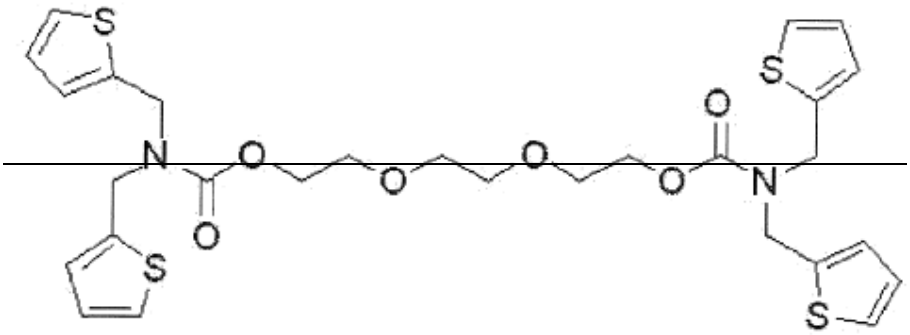
;



;



;



~~, and~~

~~mixtures or combinations thereof.~~

~~8. A pharmaceutical preparation comprising:~~

~~natural killer (NK) cells, activated NK cells, invariant natural killer T (iNKT) cells, activated iNKT cells, engineered NK cells, engineered iNKT cells, iNKT cell lines, or derivatives thereof treated with an effective amount of one activating compound or a plurality of activating compounds capable of activating integrin mediated interactions with their cognate ligands.~~

9. The pharmaceutical preparation of claim 8, wherein the activating compound comprises or the activating compounds comprise a compound or compounds of the general Formula (I):

$R^1-M^1-N(R^2)-M^2-M^3-M^4-M^5-M^6-R^3$ (I)

where:

R^1 is selected from the group consisting of aryl and aralkyl,

R^2 is alkyl, aryl, or aralkyl,

M^1 is CH_2,

M^2 is CO,

M^3 is O, S, or NR^6, where R^6 when present is hydrogen or lower alkyl,

M^4 is absent or CH_2,

M^5 is $(CR^{11}R^{12})$, where R^{11} is hydrogen, R^{12} is selected from the group consisting of hydrogen, $NR^{21}CONR^{22}R^{23}$, $NR^{21}COR^{24}$, $NR^{21}SO_2R^{24}$, $NR^{21}COOR^{24}$, $OCOR^{24}$, OR^{24}, $O(CH_2CH_2O)_sR^{24}$, $COOR^{24}$, alkyl, and hydroxyalkyl, where s is an integer of 1 to 6, R^{21} and R^{22} when present are independently selected from the group consisting of hydrogen or lower alkyl, R^{23} when present is selected from the group consisting of hydroxyalkyl, alkoxyalkyl, alkyl, aryl, aralkyl and alkoxycarbonylalkyl, provided that when M^3 is NR^6, M^4 is absent, and R^{12} is $CONR^{22}R^{23}$, then R^{23} is not 1-(1,3-benzodioxol-5-yl)-3-ethoxy-3-oxopropyl, R^{24} when present is selected from the group consisting of alkyl, aryl, aralkyl, heterocyclyl, cycloalkyl, cycloalkylalkyl, and heterocyclylalkyl,

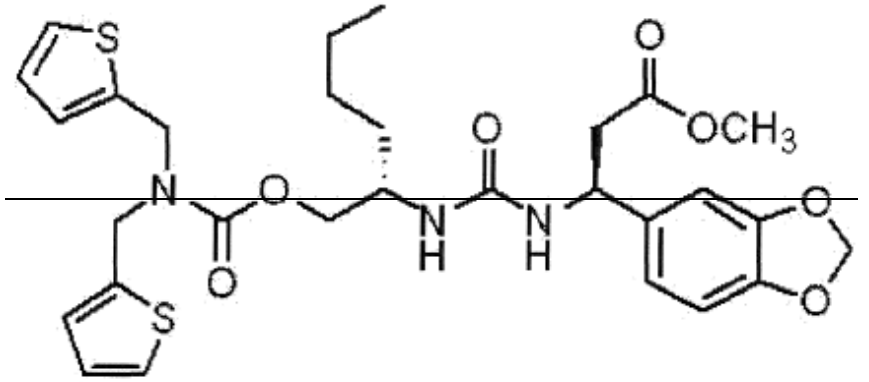
M^6 is $(CH_2)_q$, wherein q is an integer from 0 to 6,

R^3 is selected from the group consisting of hydrogen, $CONR^{13}R^{14}$, $NR^{15}COOR^{16}$, $NR^{15}COR^{16}$, $NR^{15}CONR^{13}R^{14}$, $NR^{15}SO_2R^{16}$, $OCOR^{16}$, $COOR^{16}$, OR^{16}, SR^{16}, heterocyclyl, hydroxyl, hydroxyalkyl, guanadino, alkyl and aryl, where R^{13} and R^{15} when present are independently hydrogen or lower alkyl, R^{14} and R^{16} when present are independently selected from the group consisting of hydrogen, alkyl, aryl, aralkyl, cycloalkyl, heterocyclyl, cycloalkylalkyl, and heterocyclylalkyl,

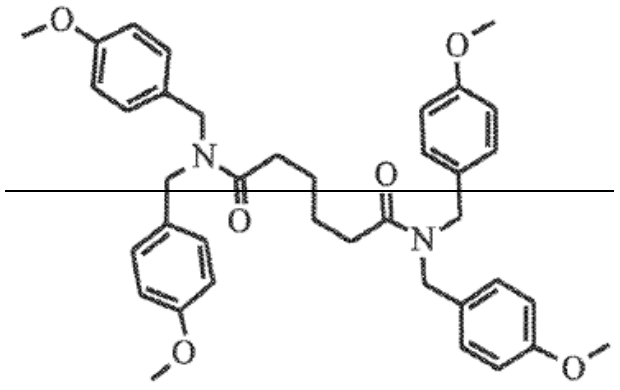
R^1, R^2, R^3, R^{12}, R^{14}, R^{16}, R^{23} and R^{24} when present may independently be either unsubstituted or substituted with one or more substituents selected from the group consisting of alkyl, aryl, aralkyl, cycloalkyl, cycloalkylalkyl, heterocyclyl,

~~heterocyclylalkyl, heterocyclylaryl, hydroxy, alkoxy, azido, haloalkoxy, hydroxyalkyl, aryloxy, hydroxyaryl, alkoxyaryl, halo, haloalkyl, haloaryl, amino, alkylamino, dialkylamino, arylamino, diarylamino, -NHCO(alkyl), -NHCO(aryl), -NHCO(aralkyl), -NHCO(haloalkyl), -$NHSO_2$(alkyl), -$NHSO_2$(aryl), -$NHSO_2$(aralkyl), alkoxycarbonyl, alkoxycarbonylalkyl, -OCO(alkylamino), and -OCO(dialkylamino).~~

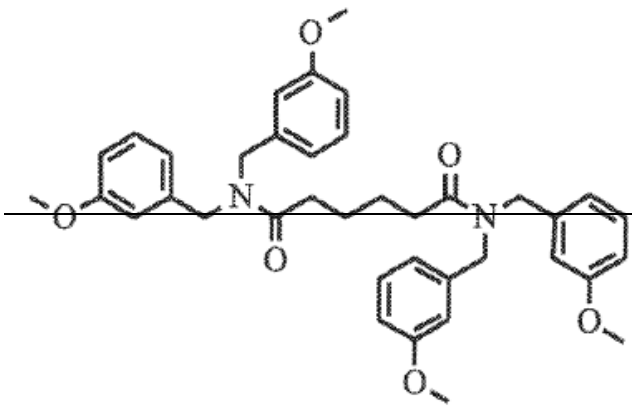
~~10. The pharmaceutical preparation of claim 8, wherein the activating compound is or the activating compounds are selected from the group consisting of:~~



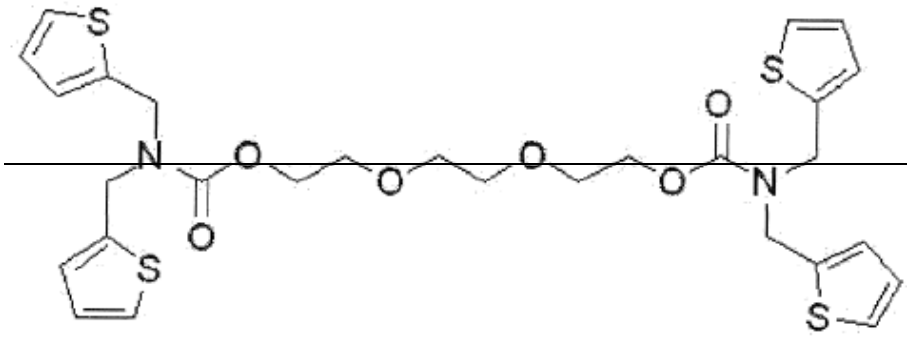
;



;



;



~~, and~~

~~mixtures or combinations thereof.~~

~~11. A method for antibody treatment comprising:~~

~~administering a composition comprising:~~

~~an antibody including an Fc region, wherein the antibody is selected from the group consisting of trastuzumab, cetuximab, ipilimumab, nivolumab rituximab, alemtuzumab, atumumab, and/or tositumomab, and~~

~~an effective amount of one activating compound or a plurality of activating compounds capable of activating integrin mediated interactions with their cognate ligands.~~

~~12. The method of claim 11, wherein the activating compound comprises or the activating compounds comprise a compound or compounds of the general Formula (I):~~

~~$R^1-M^1-N(R^2)-M^2-M^3-M^4-M^5-M^6-R^3$ (I)~~

~~where:~~

~~R^1 is selected from the group consisting of aryl and aralkyl,~~

~~R^2 is alkyl, aryl, or aralkyl,~~

~~M^1 is CH_2,~~

~~M^2 is CO,~~

~~M^3 is O, S, or NR^6, where R^6 when present is hydrogen or lower alkyl,~~

~~M^4 is absent or CH_2,~~

~~M^5 is $(CR^{11}R^{12})$, where R^{11} is hydrogen, R^{12} is selected from the group consisting of hydrogen, $NR^{21}CONR^{22}R^2$, $NR^{21}COR^{24}$, $NR^{21}SO_2R^{24}$, $NR^{21}COOR^{24}$, $OCOR^{24}$, OR^{24}, $O(CH_2CH_2O)_sR^{24}$, $COOR^{24}$, alkyl, and hydroxyalkyl, where s is an integer of 1 to 6, R^{21} and R^{22} when present are independently selected from the group~~

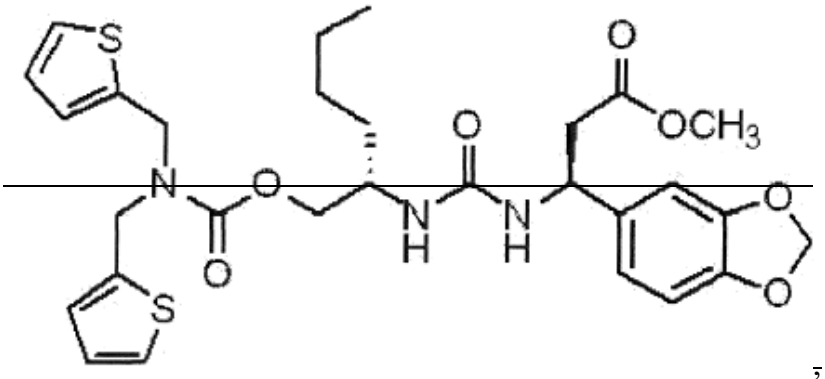
~~consisting of hydrogen or lower alkyl, R^{23} when present is selected from the group consisting of hydroxyalkyl, alkoxyalkyl, alkyl, aryl, aralkyl and alkoxycarbonylalkyl, provided that when M^3 is NR^6, M^4 is absent, and R^{12} is $CONR^{22}R^{23}$, then R^{23} is not 1-(1,3-benzodioxol-5-yl)-3-ethoxy-3-oxopropyl, R^{24} when present is selected from the group consisting of alkyl, aryl, aralkyl, heterocyclyl, cycloalkyl, cycloalkylalkyl, and heterocyclylalkyl,~~

~~M^6 is $(CH_2)_q$, wherein q is an integer from 0 to 6,~~

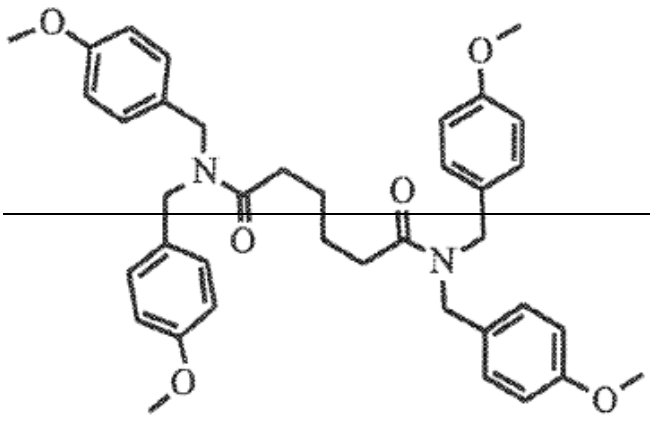
~~R^3 is selected from the group consisting of hydrogen, $CONR^{13}R^{14}$, $NR^{15}COOR^{16}$, $NR^{15}COR^{16}$, $NR^{15}CONR^{13}R^{14}$, $NR^{15}SO_2R^{16}$, $OCOR^{16}$, $COOR^{16}$, OR^{16}, SR^{16}, heterocyclyl, hydroxyl, hydroxyalkyl, guanadino, alkyl and aryl, where R^{13} and R^{15} when present are independently hydrogen or lower alkyl, R^{14} and R^{16} when present are independently selected from the group consisting of hydrogen, alkyl, aryl, aralkyl, cycloalkyl, heterocyclyl, cycloalkylalkyl, and heterocyclylalkyl,~~

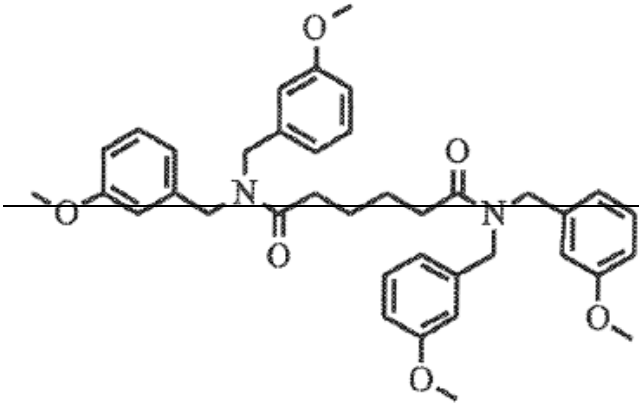
~~R^1, R^2, R^3, R^{12}, R^{14}, R^{16}, R^{23} and R^{24} when present may independently be either unsubstituted or substituted with one or more substituents selected from the group consisting of alkyl, aryl, aralkyl, cycloalkyl, cycloalkylalkyl, heterocyclyl, heterocyclylalkyl, heterocyclylaryl, hydroxy, alkoxy, azido, haloalkoxy, hydroxyalkyl, aryloxy, hydroxyaryl, alkoxyaryl, halo, haloalkyl, haloaryl, amino, alkylamino, dialkylamino, arylamino, diarylamino, -NHCO(alkyl), -NHCO(aryl), -NHCO(aralkyl), -NHCO(haloalkyl), $-NHSO_2$(alkyl), $-NHSO_2$(aryl), $-NHSO_2$(aralkyl), alkoxycarbonyl, alkoxycarbonylalkyl, -OCO(alkylamino), and -OCO(dialkylamino).~~

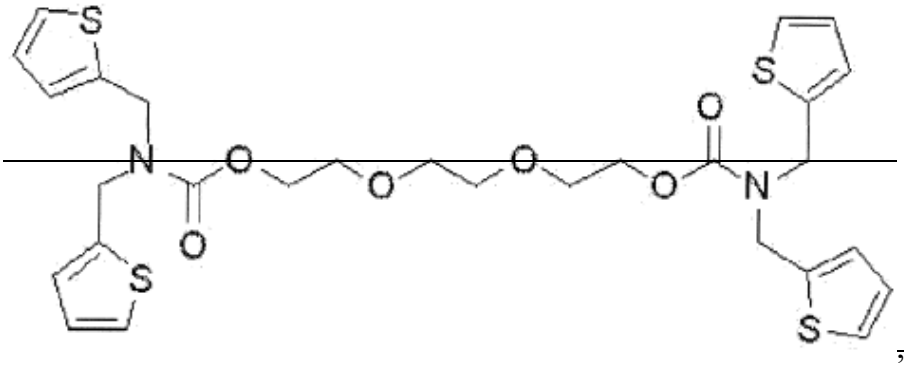
~~13. The method of claim 11, wherein the activating compound is or the activating compounds are selected from the group consisting of:~~



~~,~~


;


;


, and

mixtures or combinations thereof.

14. A pharmaceutical composition comprising:

a therapeutically ineffective amount of a therapeutic antibody, wherein the antibody includes a Fc fragment, and

an effective amount of one activating compound or a plurality of activating compounds capable of activating integrin mediated interactions with their cognate ligands,

where the effective amount is sufficient to render the antibody therapeutically effective.

15. The pharmaceutical composition of claim 14, wherein the activating compound comprises

the activating compounds comprise a compound or compounds of the general Formula (I):

$R^1-M^1-N(R^2)-M^2-M^3-M^4-M^5-M^6-R^3$ (I)

where:

R^1 is selected from the group consisting of aryl and aralkyl,

R^2 is alkyl, aryl, or aralkyl,

M^1 is CH_2,

M^2 is CO,

M^3 is O, S, or NR^6, where R^6 when present is hydrogen or lower alkyl,

M^4 is absent or CH_2,

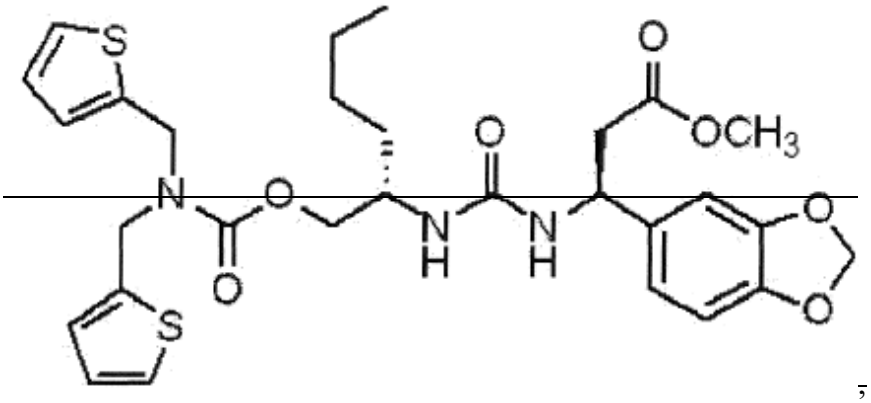
M^5 is $(CR^{11}R^{12})$, where R^{11} is hydrogen, R^{12} is selected from the group consisting of hydrogen, $NR^{21}CONR^{22}R^{23}$,$NR^{21}COR^{24}$,$NR^{21}SO_2R^{24}$,$NR^{21}COOR^{24}$, $OCOR^{24}$, OR^{24}, $O(CH_2CH_2O)_sR^{24}$, $COOR^{24}$, alkyl, and hydroxyalkyl, where s is an integer of 1 to 6, R^{21} and R^{22} when present are independently selected from the group consisting of hydrogen or lower alkyl, R^{23} when present is selected from the group consisting of hydroxyalkyl, alkoxyalkyl, alkyl, aryl, aralkyl and alkoxycarbonylalkyl, provided that when M^3 is NR^6, M^4 is absent, and R^{12} is $CONR^{22}R^{23}$, then R^{23} is not 1-(1,3-benzodioxol-5-yl)-3-ethoxy-3-oxopropyl, R^{24} when present is selected from the group consisting of alkyl, aryl, aralkyl, heterocyclyl, cycloalkyl, cycloalkylalkyl, and heterocyclylalkyl,

M^6 is $(CH_2)_q$, wherein q is an integer from 0 to 6,

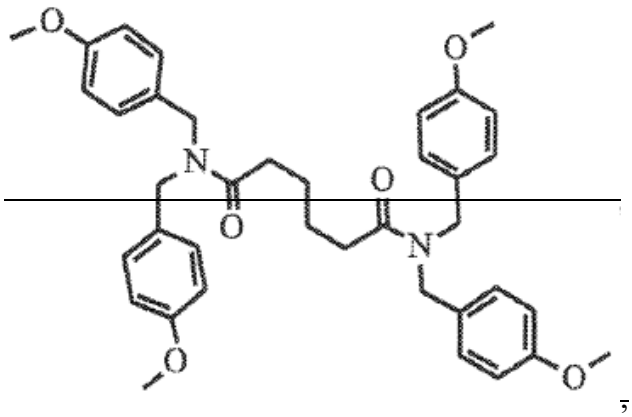
R^3 is selected from the group consisting of hydrogen, $CONR^{13}R^{14}$, $NR^{15}COOR^{16}$, $NR^{15}COR^{16}$, $NR^{15}CONR^{13}R^{14}$, $NR^{15}SO_2R^{16}$, $OCOR^{16}$, $COOR^{16}$, OR^{16}, SR^{16}, heterocyclyl, hydroxyl, hydroxyalkyl, guanadino, alkyl and aryl, where R^{13} and R^{15} when present are independently hydrogen or lower alkyl, R^{14} and R^{16} when present are independently selected from the group consisting of hydrogen, alkyl, aryl, aralkyl, cycloalkyl, heterocyclyl, cycloalkylalkyl, and heterocyclylalkyl,

~~R^1, R^2, R^3, R^{12}, R^{14}, R^{16}, R^{23} and R^{24} when present may independently be either unsubstituted or substituted with one or more substituents selected from the group consisting of alkyl, aryl, aralkyl, cycloalkyl, cycloalkylalkyl, heterocyclyl, heterocyclylalkyl, heterocyclylaryl, hydroxy, alkoxy, azido, haloalkoxy, hydroxyalkyl, aryloxy, hydroxyaryl, alkoxyaryl, halo, haloalkyl, haloaryl, amino, alkylamino, dialkylamino, arylamino, diarylamino, -NHCO(alkyl), -NHCO(aryl), -NHCO(aralkyl), -NHCO(haloalkyl), -$NHSO_2$(alkyl), -$NHSO_2$(aryl), -$NHSO_2$(aralkyl), alkoxycarbonyl, alkoxycarbonylalkyl, -OCO(alkylamino), and -OCO(dialkylamino).~~

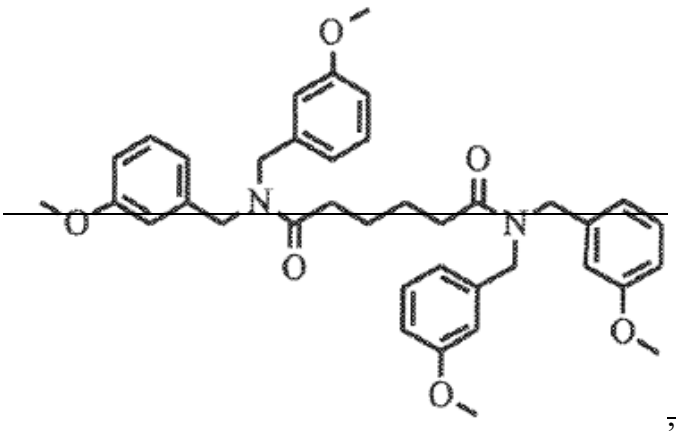
~~16. The pharmaceutical composition of claim 14, wherein the activating compound is or the activating compounds are selected from the group consisting of:~~



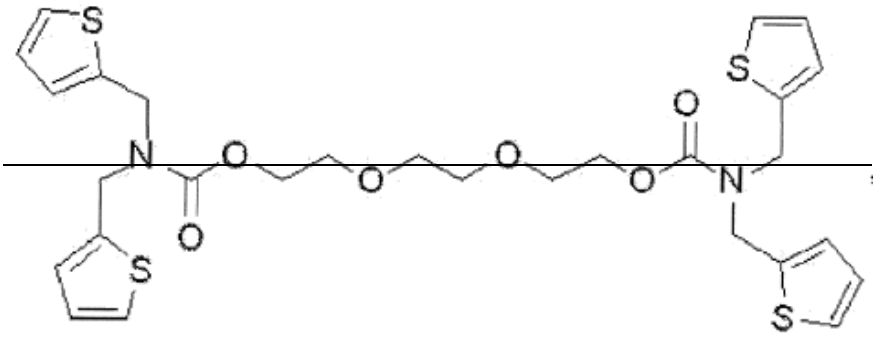
~~,~~



~~,~~



;



, and

mixtures or combinations thereof.