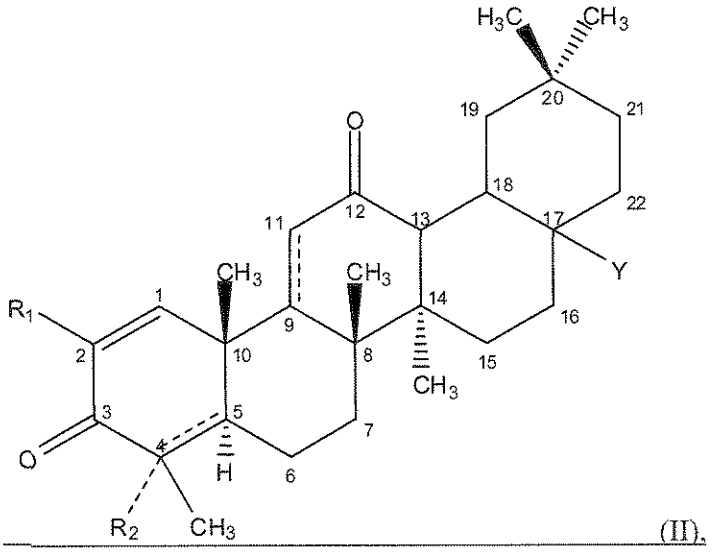
SUMMARY ~~OF THE INVENTION~~

The present disclosure provides novel synthetic triterpenoid derivatives, with anti-inflammatory and/or antioxidant properties, pharmaceutical compositions, and methods for their manufacture, and methods for their use.

In one aspect, there is provided a compound of the formula:



(II),

wherein:

R_1 is –H, –CN, halo, $-CF_3$, or $-C(O)R_a$, wherein R_a is –OH, $alkoxy_{(C1-4)}$, $-NH_2$, $alkylamino_{(C1-4)}$, or $-NH-S(O)_2-alkyl_{(C1-4)}$;

R_2 is hydrogen or R_2 is absent when the atom to which it is bound forms part of a double bond; and

Y is:

–H, –OH, –SH, –CN, –F, $-CF_3$, $-NH_2$ or –NCO;

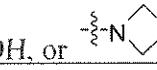
$alkyl_{(C\leq 8)}$, $alkenyl_{(C\leq 8)}$, $alkynyl_{(C\leq 8)}$, $aryl_{(C\leq 12)}$, $aralkyl_{(C\leq 12)}$, $heteroaryl_{(C\leq 8)}$, $heterocycloalkyl_{(C\leq 12)}$, $alkoxy_{(C\leq 8)}$, $aryloxy_{(C\leq 12)}$, $acyloxy_{(C\leq 8)}$, $alkylamino_{(C\leq 8)}$, $dialkylamino_{(C\leq 8)}$, $alkenylamino_{(C\leq 8)}$, $arylamino_{(C\leq 8)}$, $aralkylamino_{(C\leq 8)}$, $alkylthio_{(C\leq 8)}$, $acylthio_{(C\leq 8)}$, $alkylsulfonylamino_{(C\leq 8)}$, or substituted versions of any of these groups;

$-alkanediyl_{(C\leq 8)}-R_b$, $-alkenediyl_{(C\leq 8)}-R_b$, or a substituted version of any of these groups, wherein R_b is:

hydrogen, hydroxy, halo, or amino; or

heteroaryl$_{(C\leq 8)}$, alkoxy$_{(C\leq 8)}$, alkenyloxy$_{(C\leq 8)}$, aryloxy$_{(C\leq 8)}$, aralkoxy$_{(C\leq 8)}$, heteroaryloxy$_{(C\leq 8)}$, acyloxy$_{(C\leq 8)}$, alkylamino$_{(C\leq 8)}$, dialkylamino$_{(C\leq 8)}$, alkenylamino$_{(C\leq 8)}$, arylamino$_{(C\leq 8)}$, aralkylamino$_{(C\leq 8)}$, heteroarylamino$_{(C\leq 8)}$, alkylsulfonylamino$_{(C\leq 8)}$, amido$_{(C\leq 8)}$, $-OC(O)NH-alkyl_{(C\leq 8)}$, $-OC(O)CH_2NHC(O)O-t$-butyl, $-OCH_2-alkylthio_{(C\leq 8)}$, or a substituted version of any of these groups;

$-(CH_2)_mC(O)R_e$, wherein m is 0–6 and R_e is:

hydrogen, hydroxy, halo, amino, $-NHOH$, or ; or

alkyl$_{(C\leq 8)}$, alkenyl$_{(C\leq 8)}$, alkynyl$_{(C\leq 8)}$, aryl$_{(C\leq 8)}$, aralkyl$_{(C\leq 8)}$, heteroaryl$_{(C\leq 8)}$, heterocycloalkyl$_{(C\leq 8)}$, alkoxy$_{(C\leq 8)}$, alkenyloxy$_{(C\leq 8)}$, aryloxy$_{(C\leq 8)}$, aralkoxy$_{(C\leq 8)}$, heteroaryloxy$_{(C\leq 8)}$, acyloxy$_{(C\leq 8)}$, alkylamino$_{(C\leq 8)}$, dialkylamino$_{(C\leq 8)}$, arylamino$_{(C\leq 8)}$, alkylsulfonylamino$_{(C\leq 8)}$, amido$_{(C\leq 8)}$, $-NH-alkoxy_{(C\leq 8)}$, $-NH-heterocycloalkyl_{(C\leq 8)}$, $-NHC(NOH)-alkyl_{(C\leq 8)}$, $-NH-amido_{(C\leq 8)}$, or a substituted version of any of these groups; or

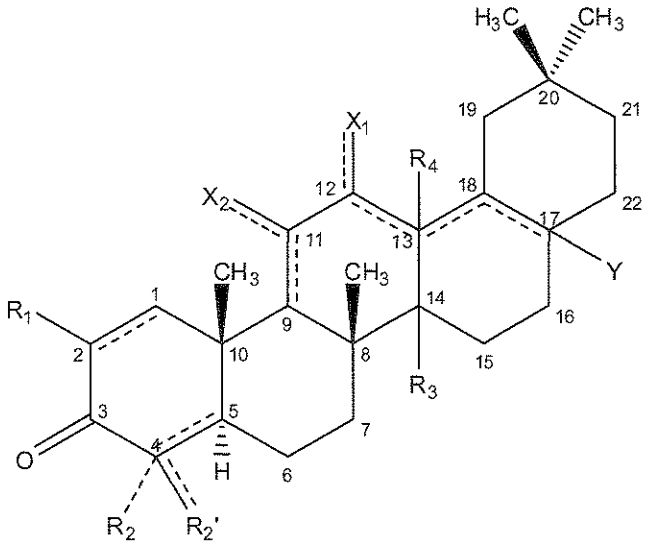
$-NHC(O)R_e$, wherein R_e is:

hydrogen, hydroxy, amino; or

alkyl$_{(C\leq 8)}$, alkenyl$_{(C\leq 8)}$, alkynyl$_{(C\leq 8)}$, aryl$_{(C\leq 8)}$, aralkyl$_{(C\leq 8)}$, heteroaryl$_{(C\leq 8)}$, heterocycloalkyl$_{(C\leq 8)}$, alkoxy$_{(C\leq 8)}$, aryloxy$_{(C\leq 8)}$, aralkoxy$_{(C\leq 8)}$, heteroaryloxy$_{(C\leq 8)}$, acyloxy$_{(C\leq 8)}$, alkylamino$_{(C\leq 8)}$, dialkylamino$_{(C\leq 8)}$, arylamino$_{(C\leq 8)}$, or a substituted version of any of these groups;

or a pharmaceutically acceptable salt or tautomer thereof.

In one ~~aspect~~example, there are provided compounds of the formula:



(I),

wherein:

X_1 and X_2 are independently hydrogen, halo, hydroxy, amino or oxo, provided that X_1 is not oxo when carbon atoms 12 and 13 are connected to one another with a double bond, further provided that X_2 is not oxo when carbon atoms 9 and 11 are connected to one another with a double bond;

R_1 is $-H$, $-CN$, halo, $-CF_3$, or $-C(O)R_a$, wherein R_a is $-OH$, $alkoxy_{(C1-4)}$, $-NH_2$, $alkylamino_{(C1-4)}$, or $-NH-S(O)_2-alkyl_{(C1-4)}$;

R_2 is hydrogen or R_2 is absent when the atom to which it is bound forms part of a double bond;

R_2' is hydrogen, $=CH_2$, $alkyl_{(C\leq 8)}$, or substituted $alkyl_{(C\leq 8)}$;

R_3 and R_4 are each independently hydrogen, hydroxy, methyl or as defined below when either of these groups is taken together with group R_c; and

Y is:

$-H$, $-OH$, $-SH$, $-CN$, $-F$, $-CF_3$, $-NH_2$ or $-NCO$;

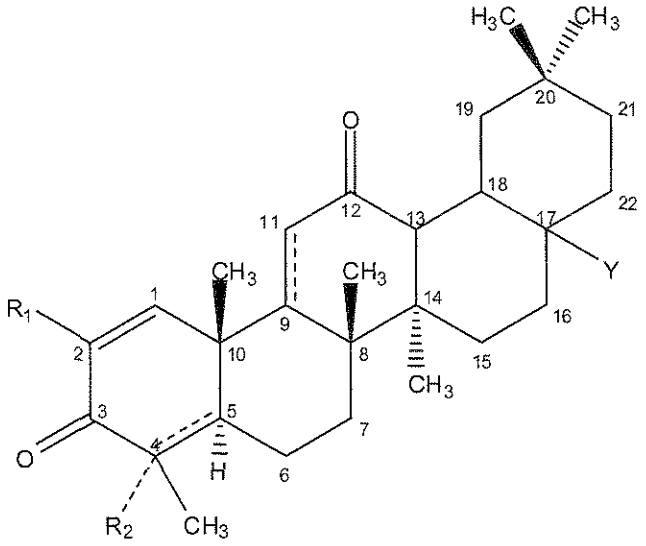
$alkyl_{(C\leq 8)}$, $alkenyl_{(C\leq 8)}$, $alkynyl_{(C\leq 8)}$, $aryl_{(C\leq 12)}$, $aralkyl_{(C\leq 12)}$, $heteroaryl_{(C\leq 8)}$, $heterocycloalkyl_{(C\leq 12)}$, $alkoxy_{(C\leq 8)}$, $aryloxy_{(C\leq 12)}$,

hydrogen, hydroxy, amino; or

$alkyl_{(C\leq 8)}$, $alkenyl_{(C\leq 8)}$, $alkynyl_{(C\leq 8)}$, $aryl_{(C\leq 8)}$, $aralkyl_{(C\leq 8)}$, $heteroaryl_{(C\leq 8)}$, $heterocycloalkyl_{(C\leq 8)}$, $alkoxy_{(C\leq 8)}$, $aryloxy_{(C\leq 8)}$, $aralkoxy_{(C\leq 8)}$, $heteroaryloxy_{(C\leq 8)}$, $acyloxy_{(C\leq 8)}$, $alkylamino_{(C\leq 8)}$, $dialkylamino_{(C\leq 8)}$, $arylamino_{(C\leq 8)}$, or a substituted version of any of these groups;

or a pharmaceutically acceptable salt or tautomer thereof.

In some ~~embodiments~~examples, the compounds are further defined by the formula:



(II),

wherein:

R_1 is –H, –CN, halo, $–CF_3$, or $–C(O)R_a$, wherein R_a is –OH, $alkoxy_{(C1-4)}$, $–NH_2$, $alkylamino_{(C1-4)}$, or $–NH–S(O)_2–alkyl_{(C1-4)}$;

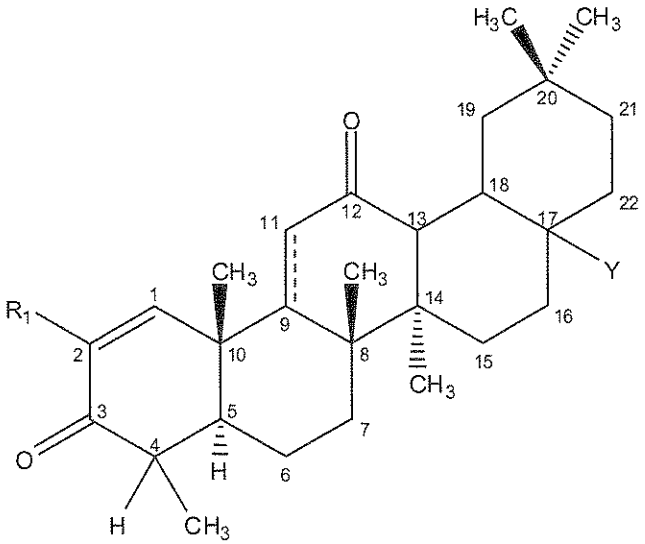
R_2 is hydrogen or R_2 is absent when the atom to which it is bound forms part of a double bond; and

Y is:

–H, –OH, –SH, –CN, –F, $–CF_3$, $–NH_2$ or –NCO;

$alkyl_{(C\leq 8)}$, $alkenyl_{(C\leq 8)}$, $alkynyl_{(C\leq 8)}$, $aryl_{(C\leq 12)}$, $aralkyl_{(C\leq 12)}$, $heteroaryl_{(C\leq 8)}$, $heterocycloalkyl_{(C\leq 12)}$, $alkoxy_{(C\leq 8)}$, $aryloxy_{(C\leq 12)}$, $acyloxy_{(C\leq 8)}$, $alkylamino_{(C\leq 8)}$, $dialkylamino_{(C\leq 8)}$, $alkenylamino_{(C\leq 8)}$, $arylamino_{(C\leq 8)}$, $aralkylamino_{(C\leq 8)}$, $alkylthio_{(C\leq 8)}$, $acylthio_{(C\leq 8)}$, $alkylsulfonylamino_{(C\leq 8)}$, or substituted versions of any of these groups;

In some ~~embodiments~~examples, the compounds are further defined by the formula:



(III),

wherein:

R_1 is –H, –CN, halo, $–CF_3$, or $–C(O)R_a$, wherein R_a is –OH, $alkoxy_{(C1-4)}$, $–NH_2$, $alkylamino_{(C1-4)}$, or $–NH–S(O)_2–alkyl_{(C1-4)}$; and

Y is:

–H, –OH, –SH, –CN, –F, $–CF_3$, $–NH_2$ or –NCO;

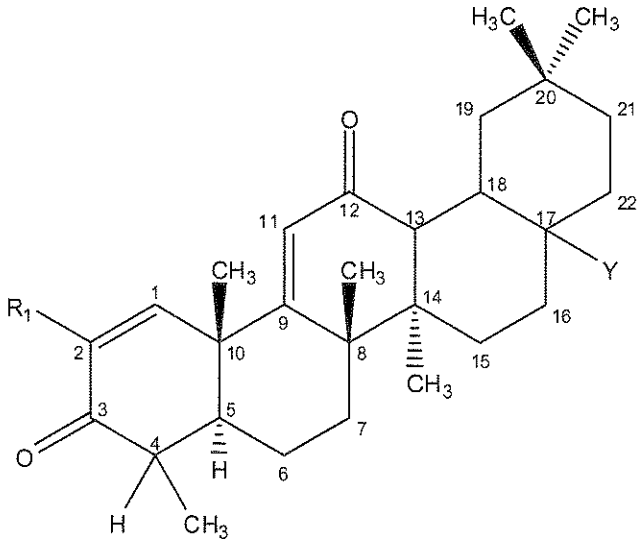
$alkyl_{(C\leq8)}$, $alkenyl_{(C\leq8)}$, $alkynyl_{(C\leq8)}$, $aryl_{(C\leq12)}$, $aralkyl_{(C\leq12)}$, $heteroaryl_{(C\leq8)}$, $heterocycloalkyl_{(C\leq12)}$, $alkoxy_{(C\leq8)}$, $aryloxy_{(C\leq12)}$, $acyloxy_{(C\leq8)}$, $alkylamino_{(C\leq8)}$, $dialkylamino_{(C\leq8)}$, $alkenylamino_{(C\leq8)}$, $arylamino_{(C\leq8)}$, $aralkylamino_{(C\leq8)}$, $alkylthio_{(C\leq8)}$, $acylthio_{(C\leq8)}$, $alkylsulfonylamino_{(C\leq8)}$, or substituted versions of any of these groups;

$–alkanediyl_{(C\leq8)}–R_b$, $–alkenediyl_{(C\leq8)}–R_b$, or a substituted version of any of these groups, wherein R_b is:

hydrogen, hydroxy, halo, amino or thio; or

$heteroaryl_{(C\leq8)}$, $alkoxy_{(C\leq8)}$, $alkenyloxy_{(C\leq8)}$, $aryloxy_{(C\leq8)}$, $aralkoxy_{(C\leq8)}$, $heteroaryloxy_{(C\leq8)}$, $acyloxy_{(C\leq8)}$, $alkylamino_{(C\leq8)}$, $dialkylamino_{(C\leq8)}$, $alkenylamino_{(C\leq8)}$, $arylamino_{(C\leq8)}$, $aralkylamino_{(C\leq8)}$, $heteroarylamino_{(C\leq8)}$, $alkylsulfonylamino_{(C\leq8)}$, $amido_{(C\leq8)}$, $–OC(O)NH–alkyl_{(C\leq8)}$, $–OC(O)CH_2NHC(O)O–t$-butyl,

In some ~~embodiments~~examples, the compounds are further defined by the formula:



(IV),

wherein:

R_1 is –H, –CN, halo, $–CF_3$, or $–C(O)R_a$, wherein R_a is –OH, $alkoxy_{(C1-4)}$, $–NH_2$, $alkylamino_{(C1-4)}$, or $–NH–S(O)_2–alkyl_{(C1-4)}$; and

Y is:

–H, –OH, –SH, –CN, –F, $–CF_3$, $–NH_2$ or –NCO;

$alkyl_{(C\leq8)}$, $alkenyl_{(C\leq8)}$, $alkynyl_{(C\leq8)}$, $aryl_{(C\leq12)}$, $aralkyl_{(C\leq12)}$, $heteroaryl_{(C\leq8)}$, $heterocycloalkyl_{(C\leq12)}$, $alkoxy_{(C\leq8)}$, $aryloxy_{(C\leq12)}$, $acyloxy_{(C\leq8)}$, $alkylamino_{(C\leq8)}$, $dialkylamino_{(C\leq8)}$, $alkenylamino_{(C\leq8)}$, $arylamino_{(C\leq8)}$, $aralkylamino_{(C\leq8)}$, $amido_{(C\leq8)}$, $alkylthio_{(C\leq8)}$, $acylthio_{(C\leq8)}$, $alkylsulfonylamino_{(C\leq8)}$, or substituted versions of any of these groups;

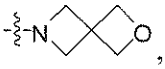
$–alkanediyl_{(C\leq8)}–R_b$, $–alkenediyl_{(C\leq8)}–R_b$, or a substituted version of any of these groups, wherein R_b is:

hydrogen, hydroxy, halo, amino or thio; or

$heteroaryl_{(C\leq8)}$, $alkoxy_{(C\leq8)}$, $alkenyloxy_{(C\leq8)}$, $aryloxy_{(C\leq8)}$, $aralkoxy_{(C\leq8)}$, $heteroaryloxy_{(C\leq8)}$, $acyloxy_{(C\leq8)}$, $alkylamino_{(C\leq8)}$, $dialkylamino_{(C\leq8)}$, $alkenylamino_{(C\leq8)}$, $arylamino_{(C\leq8)}$, $aralkylamino_{(C\leq8)}$, $heteroarylamino_{(C\leq8)}$, $alkylsulfonylamino_{(C\leq8)}$, $amido_{(C\leq8)}$, $–OC(O)NH–alkyl_{(C\leq8)}$, $–OC(O)CH_2NHC(O)O–t$-butyl,

$-OCH_2-alkylthio_{(C\leq 8)}$, or a substituted version of any of these groups;

$-(CH_2)_mC(O)R_c$, wherein m is 0–6 and R_c is:

hydrogen, hydroxy, halo, amino, –NHOH, , or thio; or

$alkyl_{(C\leq 8)}$, $alkenyl_{(C\leq 8)}$, $alkynyl_{(C\leq 8)}$, $aryl_{(C\leq 8)}$, $aralkyl_{(C\leq 8)}$, $heteroaryl_{(C\leq 8)}$, $heterocycloalkyl_{(C\leq 8)}$, $alkoxy_{(C\leq 8)}$, $alkenyloxy_{(C\leq 8)}$, $aryloxy_{(C\leq 8)}$, $aralkoxy_{(C\leq 8)}$, $heteroaryloxy_{(C\leq 8)}$, $acyloxy_{(C\leq 8)}$, $alkylamino_{(C\leq 8)}$, $dialkylamino_{(C\leq 8)}$, $arylamino_{(C\leq 8)}$, $alkylsulfonylamino_{(C\leq 8)}$, $amido_{(C\leq 8)}$, $-NH-alkoxy_{(C\leq 8)}$, $-NH-heterocycloalkyl_{(C\leq 8)}$, $-NHC(NOH)-alkyl_{(C\leq 8)}$, $-NH-amido_{(C\leq 8)}$, or a substituted version of any of these groups; or

$-NHC(O)R_e$, wherein R_e is:

hydrogen, hydroxy, amino; or

$alkyl_{(C\leq 8)}$, $alkenyl_{(C\leq 8)}$, $alkynyl_{(C\leq 8)}$, $aryl_{(C\leq 8)}$, $aralkyl_{(C\leq 8)}$, $heteroaryl_{(C\leq 8)}$, $heterocycloalkyl_{(C\leq 8)}$, $alkoxy_{(C\leq 8)}$, $aryloxy_{(C\leq 8)}$, $aralkoxy_{(C\leq 8)}$, $heteroaryloxy_{(C\leq 8)}$, $acyloxy_{(C\leq 8)}$, $alkylamino_{(C\leq 8)}$, $dialkylamino_{(C\leq 8)}$, $arylamino_{(C\leq 8)}$, or a substituted version of any of these groups;

or a pharmaceutically acceptable salt or tautomer thereof.

In some ~~embodiments~~examples, the compounds the bond between carbon atoms 1 and 2 is a double bond. In some ~~embodiments~~examples, the bond between carbon atoms 1 and 2 is a single bond. In some ~~embodiments~~examples, the bond between carbon atoms 4 and 5 is a single bond. In some ~~embodiments~~examples, the bond between carbon atoms 4 and 5 is a double bond. In some ~~embodiments~~examples, the bond between carbon atoms 9 and 11 is a double bond.

In some ~~embodiments~~examples, the bond between carbon atoms 9 and 11 is a single bond.

In some ~~embodiments~~examples, X_1 is oxo. In some ~~embodiments~~examples, X_1 is hydrogen. In some ~~embodiments~~examples, X_1 is hydroxy. In some ~~embodiments~~examples, X_2 is oxo. In some ~~embodiments~~examples, X_2 is hydrogen.

In some ~~embodiments~~examples, R_1 is –CN. In some ~~embodiments~~examples, R_1 is $-C(O)R_a$, wherein R_a is –OH, $alkoxy_{(C1-4)}$, $-NH_2$, $alkylamino_{(C1-4)}$, or $-NH-S(O)_2-alkyl_{(C1-4)}$. In some ~~embodiments~~examples, R_a is –OH. In some ~~embodiments~~examples, R_a is $alkoxy_{(C1-4)}$. In some ~~embodiments~~examples, R_a is methoxy. In some ~~embodiments~~examples, R_a is $-NH_2$. In some ~~embodiments~~examples, R_1 is –H. In some ~~embodiments~~examples, R_1 is halo. In some ~~embodiments~~examples, R_1 is iodo.

In some ~~embodiments~~examples, R_2 is hydrogen. In some ~~embodiments~~examples, R_2 is absent. In some ~~embodiments~~examples, R_2' is $alkyl_{(C\leq8)}$. In some ~~embodiments~~examples, R_2' is methyl. In some ~~embodiments~~examples, R_2' is hydrogen. In some ~~embodiments~~examples, R_2' is $=CH_2$.

In some ~~embodiments~~examples, R_3 is methyl. In some ~~embodiments~~examples, R_3 is hydrogen. In some ~~embodiments~~examples, R_4 is hydrogen. In some ~~embodiments~~examples, R_4 is methyl. In some ~~embodiments~~examples, R_4 is hydroxy.

In some ~~embodiments~~examples, Y is $-(CH_2)_mC(O)R_c$, wherein m is 0–6 and R_c is hydrogen, hydroxy, amino, –NHOH, $alkyl_{(C\leq8)}$, $alkenyl_{(C\leq8)}$, $alkynyl_{(C\leq8)}$, $aryl_{(C\leq8)}$, $aralkyl_{(C\leq8)}$, $heteroaryl_{(C\leq8)}$, $heterocycloalkyl_{(C\leq8)}$, $alkoxy_{(C\leq8)}$, $alkenyloxy_{(C\leq8)}$, $aryloxy_{(C\leq8)}$, $aralkoxy_{(C\leq8)}$, $acyloxy_{(C\leq8)}$, $alkylamino_{(C\leq8)}$, $dialkylamino_{(C\leq8)}$, $arylamino_{(C\leq8)}$, $alkylsulfonylamino_{(C\leq8)}$, $amido_{(C\leq8)}$, $-NH-alkoxy_{(C\leq8)}$, $-NH-heterocycloalkyl_{(C\leq8)}$, $-NHC(NOH)-alkyl_{(C\leq8)}$, $-NH-amido_{(C\leq8)}$, or a substituted version of any of these groups other than hydrogen, hydroxy, amino, and –NHOH.

In some ~~embodiments~~examples, R_c is $alkoxy_{(C\leq8)}$. In some ~~embodiments~~examples, R_c is methoxy, ethoxy or isopropoxy. In some ~~embodiments~~examples, R_c is hydroxy. In some ~~embodiments~~examples, R_c is amino. In some ~~embodiments~~examples, R_c is $alkylamino_{(C\leq8)}$ or substituted $alkylamino_{(C\leq8)}$. In some ~~embodiments~~examples, R_c is methylamino, ethylamino, *n*-butylamino or 2,2,2-trifluoroethylamino. In some ~~embodiments~~examples, R_c is $heteroaryl_{(C\leq8)}$. In some ~~embodiments~~examples, R_c is imidazolyl or dimethylimidazolyl. In some ~~embodiments~~examples, R_c is –NHOH or $-NHOCH_3$. In some ~~embodiments~~examples, R_c is $heterocycloalkyl_{(C\leq8)}$ or substituted $heterocycloalkyl_{(C\leq8)}$. In some ~~embodiments~~examples, R_c is *N*-pyrrolidinyl, *N*-morpholinyl, *N*-piperidinyl or *N*-azetidinyl. In some ~~embodiments~~examples, R_c is $-NH-heterocycloalkyl_{(C\leq8)}$. In some ~~embodiments~~examples, R_c is $-NH-amido_{(C\leq8)}$ or a

substituted version thereof. In some ~~embodiments~~examples, R_c is $-NHNHC(O)H$, $-NHNHC(O)CH_3$ or $-NHNHC(O)CH_2OCH_3$. In some ~~embodiments~~examples, R_c is $-NHC(NOH)CH_3$. In some ~~embodiments~~examples, m is 0. In some ~~embodiments~~examples, m is 2.

In some ~~embodiments~~examples, Y is $-alkanediyl_{(C\leq 8)}-R_b$. In some ~~embodiments~~examples, Y is $-CH_2-R_b$. In some ~~embodiments~~examples, R_b is hydroxy. In some ~~embodiments~~examples, R_b is $acyloxy_{(C\leq 8)}$ or substituted $acyloxy_{(C\leq 8)}$. In some ~~embodiments~~examples, R_b is acetyloxy, or trifluoroacetyloxy, $-OC(O)CH_2NH_2$. In some ~~embodiments~~examples, R_b is $alkoxy_{(C\leq 8)}$ or substituted $alkoxy_{(C\leq 8)}$. In some ~~embodiments~~examples, R_b is methoxy or fluoromethoxy. In some ~~embodiments~~examples, R_b is $heteroaryl_{(C\leq 8)}$. In some ~~embodiments~~examples, R_b is $-OC(O)NH-alkyl_{(C\leq 8)}$, $-OC(O)CH_2NHC(O)O-t$-butyl, or $-OCH_2-alkylthio_{(C\leq 8)}$.

In some ~~embodiments~~examples, Y is $-CN$. In some ~~embodiments~~examples, Y is isocyanate. In some ~~embodiments~~examples, Y is fluoro. In some ~~embodiments~~examples, Y is $alkylsulfonylamino_{(C\leq 8)}$ or substituted $alkylsulfonylamino_{(C\leq 8)}$. In some ~~embodiments~~examples, Y is $-NHS(O)_2CH_3$ or $-NHS(O)_2CH_2CF_3$. In some ~~embodiments~~examples, Y is $heteroaryl_{(C\leq 8)}$. In some ~~embodiments~~examples, Y is oxadiazolyl, methyloxadiazolyl, or methoxymethyloxadiazolyl. In other ~~embodiments~~examples, Y is $amido_{(C\leq 8)}$, $acyl_{(C\leq 8)}$ or substituted versions of either group.

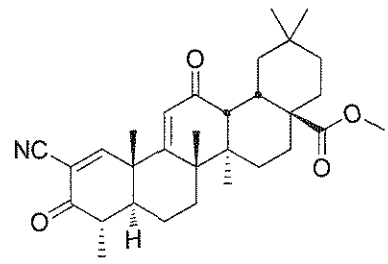
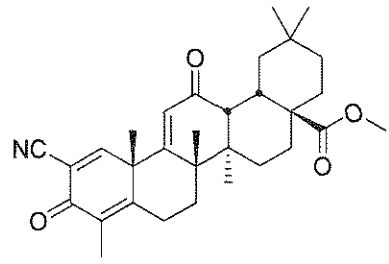
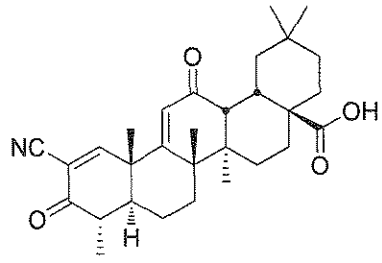
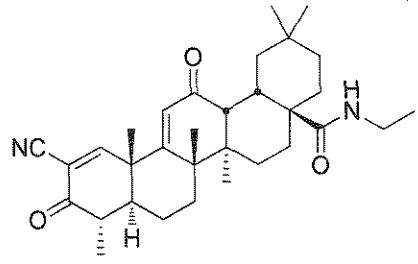
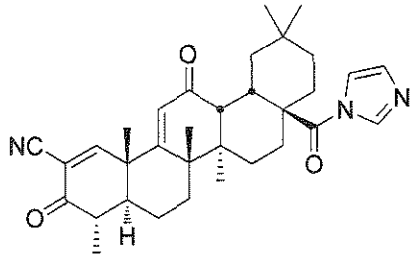
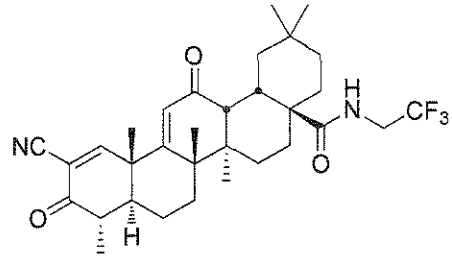
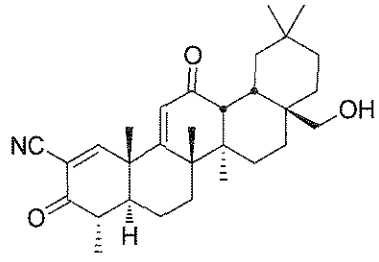
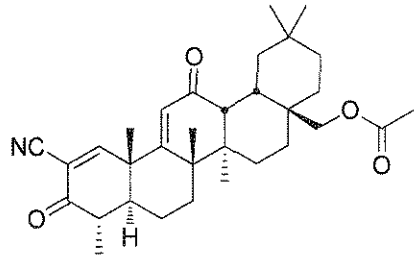
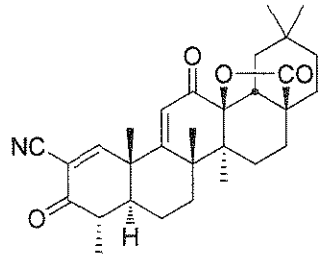
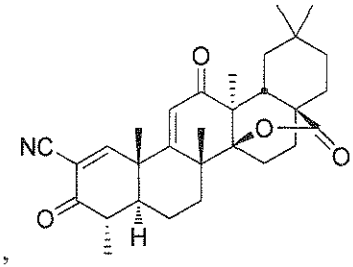
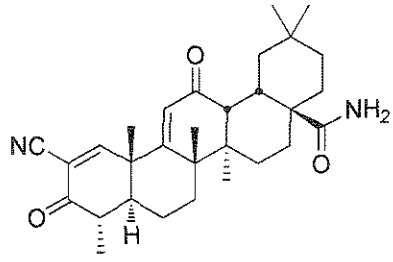
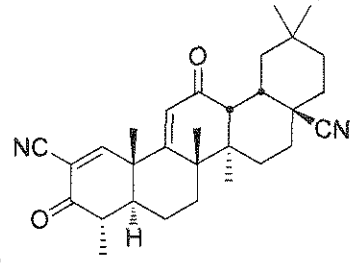
In some ~~embodiments~~examples, Y is $-NHC(O)R_e$, wherein R_e is hydrogen, hydroxy, amino, $alkyl_{(C\leq 8)}$, $aryl_{(C\leq 8)}$, $alkoxy_{(C\leq 8)}$, $acyloxy_{(C\leq 8)}$, $alkylamino_{(C\leq 8)}$, $dialkylamino_{(C\leq 8)}$, or substituted version of any of these groups other than hydrogen, hydroxy and amino. In some ~~embodiments~~examples, R_e is hydrogen. In some ~~embodiments~~examples, R_e is amino. In some ~~embodiments~~examples, R_e is $alkyl_{(C\leq 8)}$ or substituted $alkyl_{(C\leq 8)}$. In some ~~embodiments~~examples, R_e is methyl, ethyl, cyclopropyl, cyclobutyl, *n*-hexyl, 1,1-difluoroethyl, or 2,2,2-trifluoroethyl. In some ~~embodiments~~examples, R_e is $aryl_{(C\leq 8)}$. In some ~~embodiments~~examples, R_e is $alkoxy_{(C\leq 8)}$. In some ~~embodiments~~examples, R_e is methoxy, ethoxy, or isopropoxy. In some ~~embodiments~~examples, R_e is $alkylamino_{(C\leq 8)}$ or $dialkylamino_{(C\leq 8)}$. In some ~~embodiments~~examples, R_e is methylamino, ethylamino, or dimethylamino.

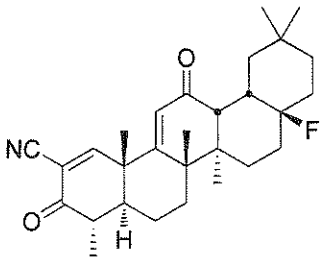
In some ~~embodiments~~examples, Y is $-(CH_2)_mC(O)R_c$, wherein m is 0 and wherein R_c and R_3 are taken together and are $-O-$. In some ~~embodiments~~examples, Y is $-(CH_2)_mC(O)R_c$, wherein m is 0 and wherein R_c and R_4 are taken together and are $-O-$.

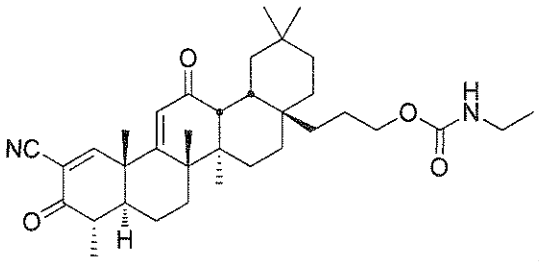
In ~~embodiments~~examples having a hydrogen at carbon atom 13, the hydrogen is in the beta orientation. In others it is the alpha orientation. In some ~~embodiments~~examples, the hydrogen at carbon atom 18 is in the beta orientation; in other ~~embodiments~~examples, it is in

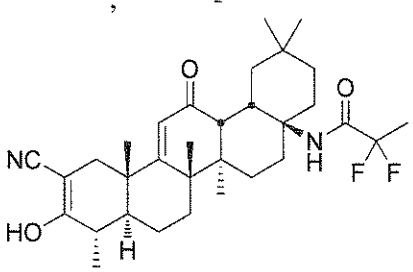
the alpha orientation. For example, in some ~~embodiments~~examples, there are hydrogen atoms at both carbon atoms 13 and 18, and they are both in the beta orientations.

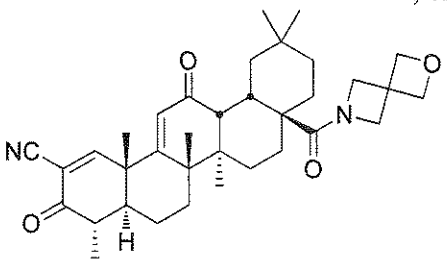
In some ~~embodiments~~examples, the disclosure~~invention~~ provides compounds of the formulas:


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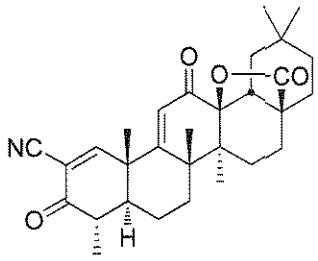
and pharmaceutically acceptable salts and tautomers thereof.

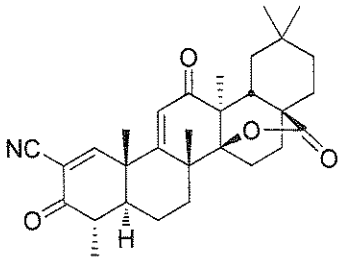
In some aspects, there are provided pharmaceutical compositions comprising one or more of the above compounds and an excipient.

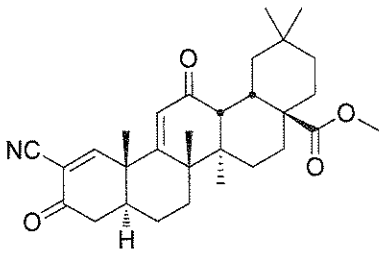
In one aspect, there is provided a compound of the present invention for use as a medicament.

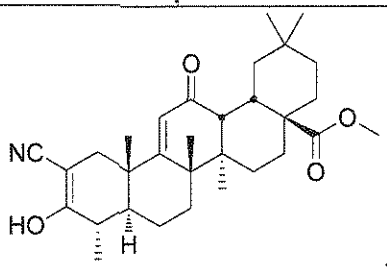
In ~~other aspects~~some examples there are provided methods of treating and/or preventing a disease or a disorder in patients in need thereof, comprising administering to such patients one or more of the above compounds in an amount sufficient to treat and/or prevent the disease or disorder.

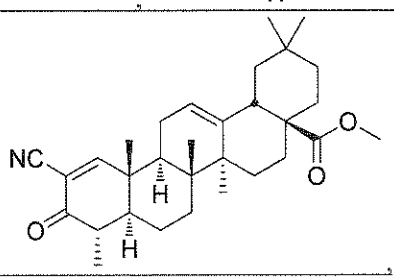
In one aspect, there is provided a compound of the formula:

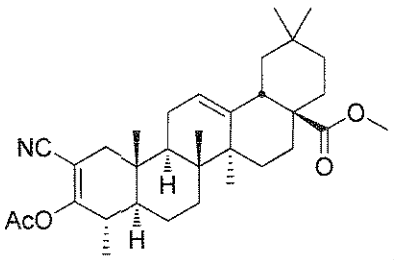


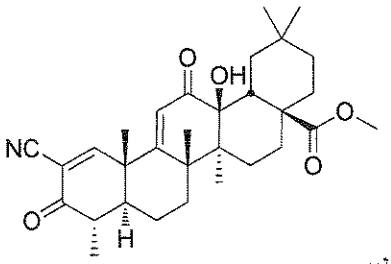


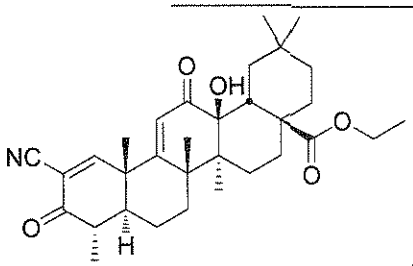


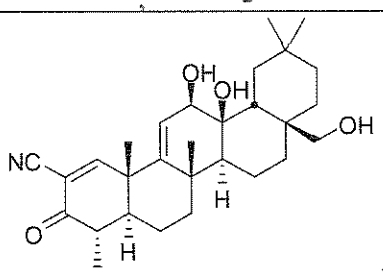


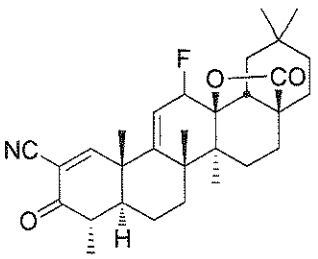


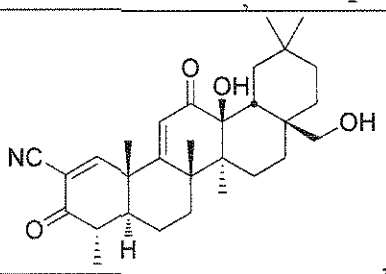


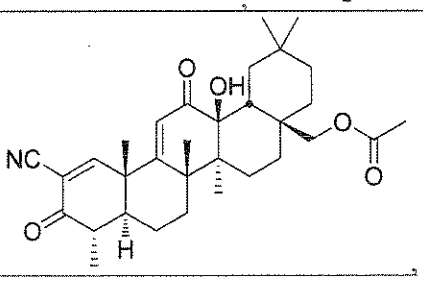




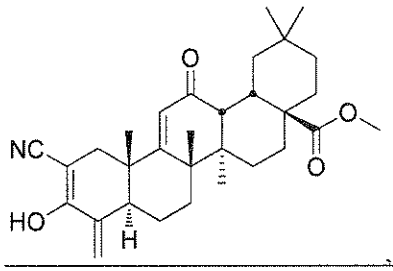




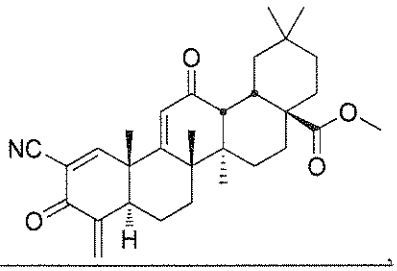




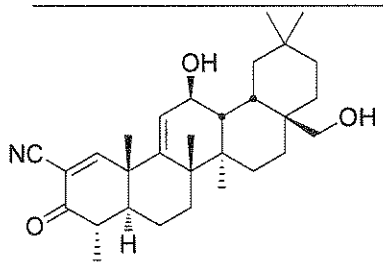
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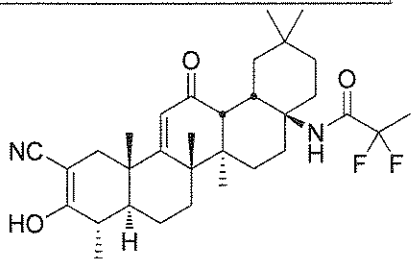
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, or

or a pharmaceutically acceptable tautomer or salt of any of the above formulas.

Other objects, features and advantages of the present disclosure will become apparent from the following detailed description. It should be understood, however, that the detailed description and the specific examples, while indicating specific embodiments of the invention, are given by way of illustration only, since various changes and modifications within the spirit and scope of the invention will become apparent to those skilled in the art from this detailed description. Note that simply because a particular compound is ascribed to one particular generic formula doesn't mean that it cannot also belong to another generic formula.