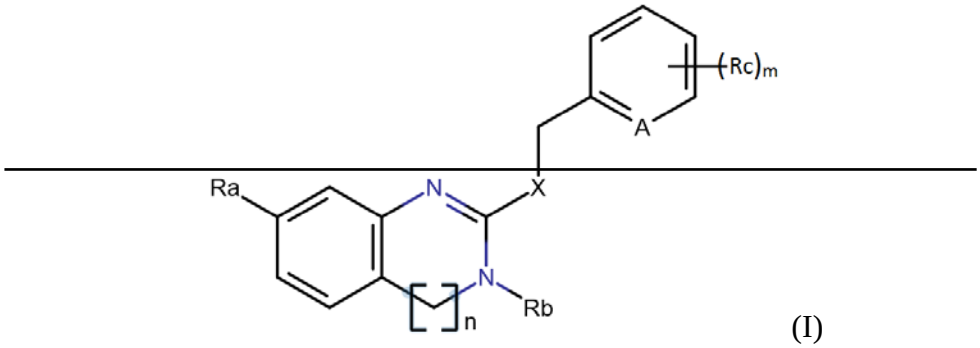
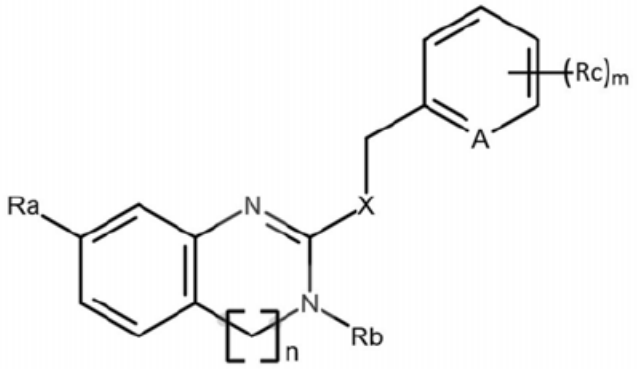
Benzimidazole Derivatives For Treating and/or Preventing Diseases or Disorders Mediated by *NLRP3*

[0001] In the present disclosure, the method uses a benzimidazole compound of formula (I):



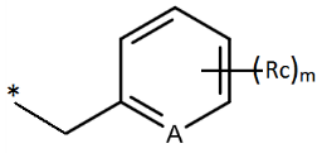
(I)



(I)

wherein n is 0 or 1,

X is –S–, –S(=O)– or –NR_n–; wherein

R_n is H or  ;

A is –CH, –CR_c or N;

R_a is –C(=O)OR_{a1}, –OR_{a2}, –O–C(=O)R_{a3} or –O–C(=O)-T-OR_{a4}; wherein

R_{a1} is H or linear or branched $C_{1\text{-}15}$alkyl;

R_{a2} is H, linear or branched $C_{1\text{-}15}$alkyl, phosphonate or diarylphosphonate;

R_{a3} and R_{a4} are independently linear or branched $C_{1\text{-}15}$alkyl, linear or branched $C_{2\text{-}15}$alkenyl, -T-$C_{3\text{-}10}$cycloalkyl, -T-NHR_{a3p}, -T-$C_{3\text{-}10}$cycloalkenyl, -T-$C_{6\text{-}10}$aryl, -T-$C_{5\text{-}10}$heteroaryl, -T-NH-C(=O)-O-$C_{1\text{-}10}$alkyl, -T-adamantyl or -$C_{1\text{-}3}$alkylene-$C_{6\text{-}10}$aryl

where the alkylene is substituted with -T-NHR_{a3p};

R_{a3p} is H, fluorenylmethoxycarbonyl (Fmoc) or tert-butoxycarbonyl (Boc);

R_b is H, linear or branched C_{1-15}alkyl, linear or branched C_{2-15}alkenyl, C_{1-3}alkoxy-C_{1-15}alkyl-, -T'-C_{3-10}cycloalkyl, -T'-C_{3-10}cycloalkenyl, -T'-C_{6-10} aryl or -T'-C_{5-10}heteroaryl;

R_c each is independently halogen, linear or branched C_{1-15}alkyl, linear or branched C_{1-15}alkoxyl, hydroxyl, or –C_{1-10}alkylene-Y-C_{6-10}heteroaryl wherein -Y- is -CH_2-, -NH-, -O- or -S-;

symbol * represents the bonding position;

m is an integer from 0 to 4;

-T- is absent, C_{1-3}alkylene or C_{2-3}alkenylene;

-T'- is C_{1-3}alkylene or C_{2-3}alkenylene; and

wherein the heteroaryl contains at least one heteroatom, each heteroatom being independently S, N or O;

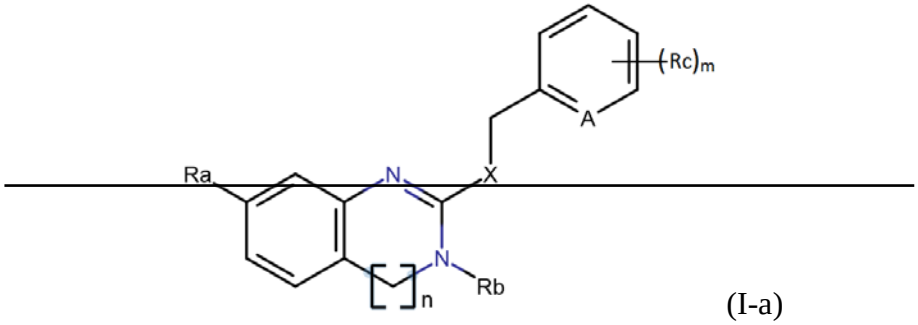
wherein the alkyl, alkenyl, alkoxy, cycloalkyl, aryl, heteroaryl, alkylene and alkenylene are each independently unsubstituted or substituted with at least one substituent;

wherein the substituent is each independently a halogen, amino, nitro, nitroso, linear or branched C_{1-15} alkyl,or linear or branched C_{1-15} alkoxy or C_{3-10}cycloalkyl; and

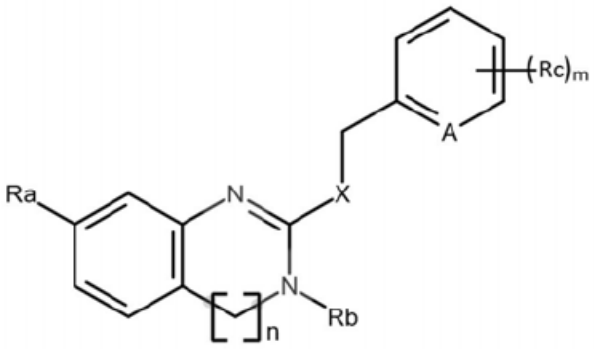
when R_b is H, the tautomers are included,

or a pharmaceutically acceptable salt thereof.

[0044] In one embodiment, the compound of formula (I) is a compound of formula (I-a):



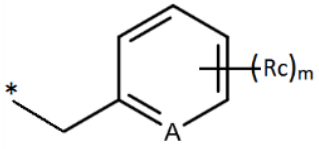
(I-a)



(I-a)

wherein n is 0 or 1,

X is –S–, –S(=O)– or –NR_n–; wherein

R_n is H or 

;

A is –CH, –CR_c or N;

R_a is –C(=O)OR_{a1}, –OR_{a2}, –O–C(=O)R_{a3} or –O–C(=O)-T-OR_{a4}; wherein

R_{a1} is H or linear or branched C_{1-15}alkyl;

R_{a2} is H, linear or branched C_{1-15}alkyl or diarylphosphonate;

R_{a3} and R_{a4} are independently linear or branched C_{1-15}alkyl, linear or branched C_{2-15}alkenyl, -T-C_{3-10}cycloalkyl, -T-NHR_{a3p}, -T-C_{3-10}cycloalkenyl, -T-C_{6-10}aryl, -T-C_{5-10}heteroaryl, -T-NH-C(=O)-O-C_{1-10}alkyl or -T-adamantyl;

R_{a3p} is H, Fmoc or Boc;

R_b is H, linear or branched C_{1-15}alkyl, linear or branched C_{2-15}alkenyl, C_{1-3}alkoxy-C_{1-15}alkyl-, -T'-C_{3-10}cycloalkyl, -T'-C_{3-10}cycloalkenyl, -T'-C_{6-10} aryl or -T'-C_{5-10}heteroaryl;

R_c each is independently halogen, linear or branched C_{1-15}alkyl, linear or branched C_{1-15}alkoxyl, hydroxyl, or –C_{1-10}alkylene-Y-C_{6-10}heteroaryl wherein -Y- is -CH_2-, -NH-, -O- or -S-;

symbol * represents the bonding position;

m is an integer from 0 to 4;

-T- is absent, C_{1-3}alkylene or C_{2-3}alkenylene;

-T'- is C_{1-3}alkylene or C_{2-3}alkenylene; and

wherein the heteroaryl contains at least one heteroatom, each heteroatom being independently S, N or O;

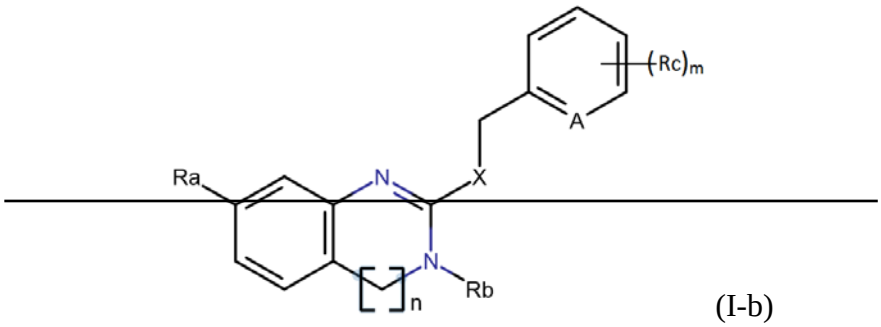
wherein the alkyl, alkenyl, alkoxy, cycloalkyl, aryl, heteroaryl, alkylene and alkenylene are each independently unsubstituted or substituted with at least one substituent;

wherein the substituent is each independently a halogen, amino, nitro, nitroso, linear or branched C_{1-15} alkyl, linear or branched C_{1-15} alkoxy or C_{3-10}cycloalkyl and

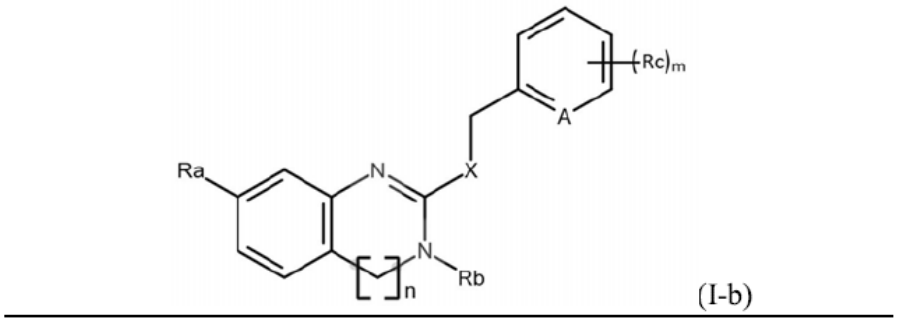
when R_b is H, the tautomers are included,

or a pharmaceutically acceptable salt thereof.

[0045] In one embodiment, the compound of formula (I) is a compound of formula (I-b),



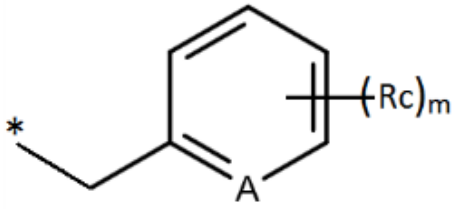
(I-b)



(I-b)

wherein n is 0 or 1,

X is –S–, –S(=O)– or –NR_n–;

Rn is H or 

;