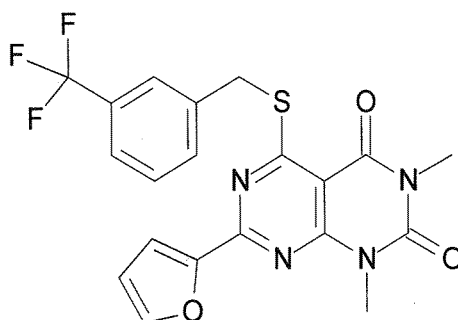




[0013] Some embodiments of the present disclosure include a pharmaceutical composition which comprises a compound as described herein.

[0013a] The use of a pharmaceutical composition as described herein, in the manufacture of a medicament for treating or preventing a viral infection in a vertebrate.

[0013b] The use of a compound as described herein or a pharmaceutical composition as described herein in the manufacture of a medicament for modulating the innate immune response in a eukaryotic cell.

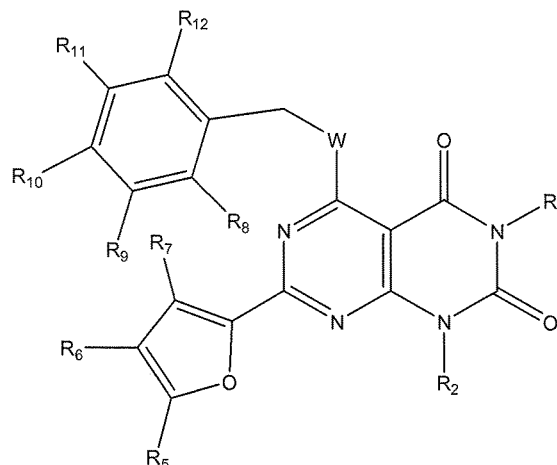
[0013c] An *in vitro* method for modulating the innate immune response in a eukaryotic cell comprising administering to the cell a compound as described herein or a pharmaceutical composition as described herein.

[0014] Some embodiments of the present disclosure include a method of treating or preventing a viral infection in a vertebrate comprising administering to the vertebrate a pharmaceutical composition which comprises a compound as described herein. In some embodiments, the viral infection is caused by a virus from one or more of the following families: Arenaviridae, Astroviridae, Birnaviridae, Bromoviridae, Bunyaviridae, Caliciviridae, Closteroviridae, Comoviridae, Cystoviridae, Flaviviridae, Flexiviridae, Hepevirus, Leviviridae, Luteoviridae, Mononegavirales, Mosaic Viruses, Nidovirales, Nodaviridae, Orthomyxoviridae, Picobirnavirus, Picornaviridae, Potyviridae, Reoviridae, Retroviridae, Sequiviridae, Tenuivirus, Togaviridae, Tombusviridae, Totiviridae, Tymoviridae, Hepadnaviridae, Herpesviridae, Paramyxoviridae or Papillomaviridae. In some embodiments, the viral infection is influenza virus, Hepatitis C virus, West Nile virus, SARS-coronavirus, poliovirus, measles virus,

Dengue virus, yellow fever virus, tick-borne encephalitis virus, Japanese encephalitis virus, St. Louis encephalitis virus, Murray Valley virus, Powassan virus, Rocio virus, louping-ill virus, Banzi virus, Ilheus virus, Kokobera virus, Kunjin virus, Alfuy virus, bovine diarrhea virus, Kyasanur forest disease virus or HIV.

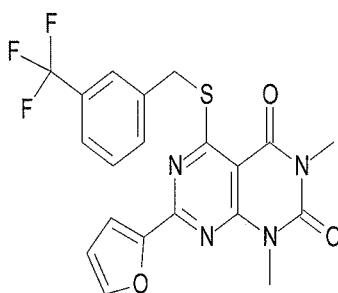
[0015] In some embodiments, the pharmaceutical composition is administered as an adjuvant for a prophylactic or therapeutic vaccine. In some embodiments, the method further comprises vaccinating a vertebrate by additionally administering a vaccine against influenza virus, Hepatitis C virus, West Nile virus, SARS-coronavirus, poliovirus, measles virus, Dengue virus, yellow fever virus, tick-borne encephalitis virus, Japanese encephalitis virus, St. Louis encephalitis virus, Murray Valley virus, Powassan virus,

11. A compound of any one of the preceding claims, wherein Z_1 is $C=O$.
12. A compound of any one of the preceding claims, wherein Z_2 is $C=O$.
13. A compound of claim 1, further represented by the formula:



wherein R_1 , R_2 , R_5 , R_6 , R_7 , R_8 , R_9 , R_{10} , R_{11} , and R_{12} are independently R_c , OR_c , COR_c , CO_2R_c , $OCOR_c$, NR_cR_d , CF_3 , CN , NO_2 , F , Cl , Br , or I , wherein R_c and R_d are independently H or C_{1-3} alkyl.

14. A compound of claim 13, wherein R_{11} is CF_3 .
15. A compound of claim 13 or 14, wherein R_1 is CH_3 .
16. A compound of claim 13, 14, or 15, wherein R_2 is CH_3 .
17. A compound of claim 1, wherein the compound is represented by the formula



18. A pharmaceutical composition comprising a compound according to any one of claims 1-17.
19. ~~A method of~~The use of a pharmaceutical composition according to claim 18 in the manufacture of a medicament for treating or preventing a viral infection in a vertebrate comprising administering to the vertebrate a pharmaceutical composition according to claim 16.

20. The ~~method-use~~ of claim 19 wherein the viral infection is caused by a virus from one or more of the following families: Arenaviridae, Astroviridae, Birnaviridae, Bromoviridae, Bunyaviridae, Caliciviridae, Closteroviridae, Comoviridae, Cystoviridae, Flaviviridae, Flexiviridae, Hepevirus, Leviviridae, Luteoviridae, Mononegavirales, Mosaic Viruses, Nidovirales, Nodaviridae, Orthomyxoviridae, Picobirnavirus, Picornaviridae, Potyviridae, Reoviridae, Retroviridae, Sequiviridae, Tenuivirus, Togaviridae, Tombusviridae, Totiviridae, Tymoviridae, Hepadnaviridae, Herpesviridae, Paramyxoviridae or Papillomaviridae.

21. The ~~method-use~~ of claim 19 wherein the viral infection is influenza virus, Hepatitis C virus, West Nile virus, SARS-coronavirus, poliovirus, measles virus, Dengue virus, yellow fever virus, tick-borne encephalitis virus, Japanese encephalitis virus, St. Louis encephalitis virus, Murray Valley virus, Powassan virus, Rocio virus, louping-ill virus, Banzi virus, Ilheus virus, Kokobera virus, Kunjin virus, Alfuy virus, bovine diarrhea virus, Kyasanur forest disease virus or human immunodeficiency virus (HIV).

22. The ~~method-use~~ of any one of claims 19-21 wherein the pharmaceutical composition is ~~administered as an~~ adjuvant for a prophylactic or therapeutic vaccine.

23. The ~~method-use~~ of claim 22 wherein the ~~method comprises vaccinating a vertebrate by additionally administering~~ medicament is administered in combination with a vaccine against influenza virus, Hepatitis C virus, West Nile virus, SARS-coronavirus, poliovirus, measles virus, Dengue virus, yellow fever virus, tick-borne encephalitis virus, Japanese encephalitis virus, St. Louis encephalitis virus, Murray Valley virus, Powassan virus, Rocio virus, louping-ill virus, Banzi virus, Ilheus virus, Kokobera virus, Kunjin virus, Alfuy virus, bovine diarrhea virus, Kyasanur forest disease virus or human immunodeficiency virus (HIV).

24. ~~A method~~ The use of a compound according to any one of claims 1-15 or a pharmaceutical composition according to claim 18 in the manufacture of a medicament for ~~of~~ modulating the innate immune response in a eukaryotic cell, ~~comprising administering to the cell a compound according to any one of claims 1-15.~~

25. ~~A method of claim 24, wherein the cell is in vivo.~~

256. An *in vitro* method for modulating the innate immune response in a eukaryotic cell comprising administering to the cell a compound according to any one of claims 1-15 or a pharmaceutical composition according to claim 18 ~~of claim 24, wherein the cell is in vitro.~~