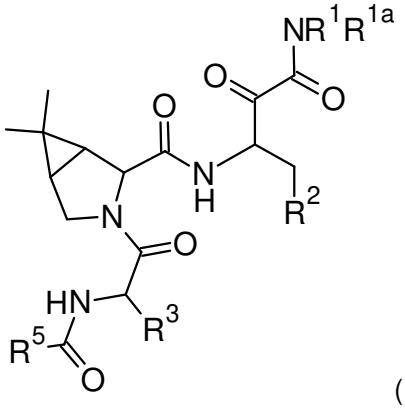
CLAIMS

1. A compound of Formula (1b):



(1b);

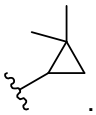
or a salt thereof, wherein:

R^1 and R^{1a} are independently H, a C_{1-6} saturated hydrocarbon group optionally substituted with 1 to 6 fluorine or chlorine atoms or a benzyl group optionally substituted with 1 to 6 fluorine or chlorine atoms or R^1 and R^{1a} are linked together to form a saturated ring optionally containing an additional heteroatom;

R^2 is a C_{3-5} saturated hydrocarbon group containing a cycloalkyl group optionally substituted with one or more substituents chosen from fluorine or hydroxyl;

R^3 is a saturated group containing 3-5 carbon atoms and optionally containing a cycloalkyl group or optionally containing a saturated ring containing an oxygen heteroatom and optionally substituted with one or more substituents chosen from fluorine, or hydroxyl or R^3 is CH_2aryl, $CH(CH_3)$aryl or $C(CH_3)_2$aryl; and

R^5 is a C_{2-8} hydrocarbon group, optionally containing one or more rings or a double bond and which is optionally substituted with one or more groups selected from fluorine; chlorine; bromine; cyano; hydroxy; methoxy; amino; or a cycloalkyl, heterocycloalkyl, aryl or heteroaryl group.

2. The compound according to claim 1, wherein R^1 is H, CH_3, benzyl, cyclopropyl or .

3. The compound according to claim 1 or claim 2, wherein R^{1a} is H.

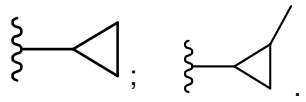
4. The compound according to claim 1, wherein R^1 and R^{1a} are both H.

5. The compound according to claim 1, wherein R^1 and R^{1a} are both $–CH_3$.

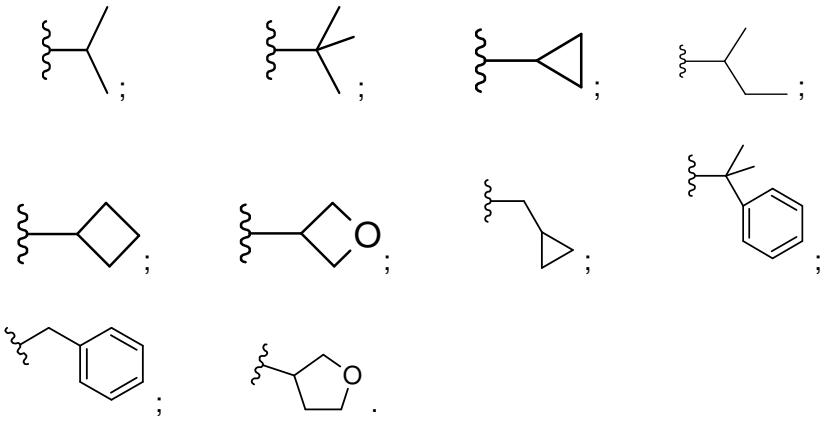
6. The compound according to claim 1, wherein R^1 and R^{1a} are linked together to form a saturated ring of 3 to 6 atoms.

7. The compound according to claim 1, wherein R^1 and R^{1a} are linked together to form an azetidine or aziridine ring.

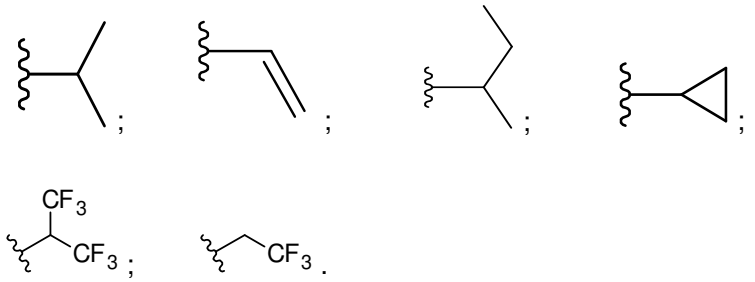
8. The compound according to any one of claims 1 to 7, wherein R^2 is selected from the group consisting of:



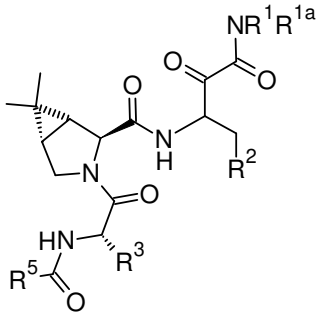
9. The compound according to any one of claims 1 to 8, wherein R^3 is selected from the group consisting of:



10. The compound according to any one of claims 1 to 9, wherein R^5 is selected from the group consisting of:



11. The compound according to claim 1, which is a compound of formula (3b):



(3b);

or a salt thereof.

12. The compound according to claim 1, which is selected from the group consisting of:

(1*R*,2*S*,5*S*)-*N*-(4-Amino-1-cyclopropyl-3,4-dioxobutan-2-yl)-3-((*S*)-2-isobutyramido-3,3-dimethylbutanoyl)-6,6-dimethyl-3-azabicyclo[3.1.0]hexane-2-carboxamide;

(1*R*,2*S*,5*S*)-*N*-[3-Amino-1-(cyclopropylmethyl)-2,3-dioxo-propyl]-3-[(2*S*)-2-(cyclopropanecarbonylamino)-3-methylbutanoyl]-6,6-dimethyl-3-azabicyclo[3.1.0]hexane-2-carboxamide;

(1*R*,2*S*,5*S*)-*N*-(4-Amino-1-cyclopropyl-3,4-dioxobutan-2-yl)-3-(isobutyryl-*L*-alloisoleucyl)-6,6-dimethyl-3-azabicyclo[3.1.0]hexane-2-carboxamide;

(1*R*,2*S*,5*S*)-3-(Acryloyl-*L*-valyl)-*N*-(4-amino-1-cyclopropyl-3,4-dioxobutan-2-yl)-6,6-dimethyl-3-azabicyclo[3.1.0]hexane-2-carboxamide;

(1*R*,2*S*,5*S*)-*N*-(4-Amino-1-((1R,2S)-2-methylcyclopropyl)-3,4-dioxobutan-2-yl)-3-(isobutyryl-*L*-valyl)-6,6-dimethyl-3-azabicyclo[3.1.0]hexane-2-carboxamide;

(1*R*,2*S*,5*S*)-*N*-(4-Amino-1-cyclopropyl-3,4-dioxobutan-2-yl)-3-((*S*)-3-cyclopropyl-2-isobutyramidopropanoyl)-6,6-dimethyl-3-azabicyclo[3.1.0]hexane-2-carboxamide;

(1*R*,2*S*,5*S*)-*N*-(4-Amino-1-cyclopropyl-3,4-dioxobutan-2-yl)-3-(isobutyryl-*L*-valyl)-6,6-dimethyl-3-azabicyclo[3.1.0]hexane-2-carboxamide;

(1*R*,2*S*,5*S*)-*N*-(4-Amino-1-cyclopropyl-3,4-dioxobutan-2-yl)-6,6-dimethyl-3-(((*S*)-2-methylbutanoyl)-*L*-valyl)-3-azabicyclo[3.1.0]hexane-2-carboxamide;

(1*R*,2*S*,5*S*)-*N*-(4-Amino-1-cyclopropyl-3,4-dioxobutan-2-yl)-3-((S)-2-(cyclopropanecarboxamido)-2-cyclopropylacetyl)-6,6-dimethyl-3-azabicyclo[3.1.0]hexane-2-carboxamide;

(1*R*,2*S*,5*S*)-*N*-(4-Amino-1-cyclopropyl-3,4-dioxobutan-2-yl)-3-((*S*)-2-cyclopropyl-2-isobutyramidoacetyl)-6,6-dimethyl-3-azabicyclo[3.1.0]hexane-2-carboxamide;

(1*R*,2*S*,5*S*)-*N*-(4-(Benzylamino)-1-cyclopropyl-3,4-dioxobutan-2-yl)-3-(isobutyryl-*L*-valyl)-6,6-dimethyl-3-azabicyclo[3.1.0]hexane-2-carboxamide;

(1*R*,2*S*,5*S*)-*N*-(1-Cyclopropyl-4-(cyclopropylamino)-3,4-dioxobutan-2-yl)-3-(isobutyryl-*L*-valyl)-6,6-dimethyl-3-azabicyclo[3.1.0]hexane-2-carboxamide;

(1*R*,2*S*,5*S*)-*N*-(4-Amino-1-cyclopropyl-3,4-dioxobutan-2-yl)-3-(2-isobutyramido-2-(oxetan-3-yl)acetyl)-6,6-dimethyl-3-azabicyclo[3.1.0]hexane-2-carboxamide;

(1*R*,2*S*,5*S*)-*N*-(4-Amino-1-cyclopropyl-3,4-dioxobutan-2-yl)-3-((*S*)-2-(cyclopropanecarboxamido)-3,3-dimethylbutanoyl)-6,6-dimethyl-3-azabicyclo[3.1.0]hexane-2-carboxamide;

(1*R*,2*S*,5*S*)-3-((*S*)-2-Acrylamido-3,3-dimethylbutanoyl)-*N*-(4-amino-1-cyclopropyl-3,4-dioxobutan-2-yl)-6,6-dimethyl-3-azabicyclo[3.1.0]hexane-2-carboxamide;

(1*R*,2*S*,5*S*)-3-((*S*)-2-Acrylamido-3,3-dimethylbutanoyl)-*N*-(4-(benzylamino)-1-cyclopropyl-3,4-dioxobutan-2-yl)-6,6-dimethyl-3-azabicyclo[3.1.0]hexane-2-carboxamide;

(1*R*,2*S*,5*S*)-*N*-(4-(Benzylamino)-1-cyclopropyl-3,4-dioxobutan-2-yl)-3-((*S*)-2-isobutyramido-3,3-dimethylbutanoyl)-6,6-dimethyl-3-azabicyclo[3.1.0]hexane-2-carboxamide;

(1*R*,2*S*,5*S*)-*N*-(4-(Benzylamino)-1-cyclopropyl-3,4-dioxobutan-2-yl)-3-((*S*)-2-(cyclopropanecarboxamido)-3,3-dimethylbutanoyl)-6,6-dimethyl-3-azabicyclo[3.1.0]hexane-2-carboxamide;

(1*R*,2*S*,5*S*)-3-((*S*)-2-(Cyclopropanecarboxamido)-3,3-dimethylbutanoyl)-*N*-(1-cyclopropyl-4-(cyclopropylamino)-3,4-dioxobutan-2-yl)-6,6-dimethyl-3-azabicyclo[3.1.0]hexane-2-carboxamide;

(1*R*,2*S*,5*S*)-3-((*S*)-2-Acrylamido-3,3-dimethylbutanoyl)-*N*-(1-cyclopropyl-4-(cyclopropylamino)-3,4-dioxobutan-2-yl)-6,6-dimethyl-3-azabicyclo[3.1.0]hexane-2-carboxamide;

(1*R*,2*S*,5*S*)-*N*-(1-Cyclopropyl-4-(cyclopropylamino)-3,4-dioxobutan-2-yl)-3-((*S*)-2-isobutyramido-3,3-dimethylbutanoyl)-6,6-dimethyl-3-azabicyclo[3.1.0]hexane-2-carboxamide;

(1*R*,2*S*,5*S*)-*N*-(1-Cyclopropyl-4-(methylamino)-3,4-dioxobutan-2-yl)-3-((*S*)-2-isobutyramido-3,3-dimethylbutanoyl)-6,6-dimethyl-3-azabicyclo[3.1.0]hexane-2-carboxamide;

(1*R*,2*S*,5*S*)-*N*-(1-Cyclopropyl-4-(dimethylamino)-3,4-dioxobutan-2-yl)-3-((*S*)-2-isobutyramido-3,3-dimethylbutanoyl)-6,6-dimethyl-3-azabicyclo[3.1.0]hexane-2-carboxamide;

(1*R*,2*S*,5*S*)-*N*-(4-(Aziridin-1-yl)-1-cyclopropyl-3,4-dioxobutan-2-yl)-3-((*S*)-2-isobutyramido-3,3-dimethylbutanoyl)-6,6-dimethyl-3-azabicyclo[3.1.0]hexane-2-carboxamide;

(1*R*,2*S*,5*S*)-*N*-(4-Amino-1-cyclopropyl-3,4-dioxobutan-2-yl)-3-((*S*)-2-cyclobutyl-2-isobutyramidoacetyl)-6,6-dimethyl-3-azabicyclo[3.1.0]hexane-2-carboxamide;

(1*R*,2*S*,5*S*)-*N*-(4-Amino-1-cyclopropyl-3,4-dioxobutan-2-yl)-3-((*S*)-2-isobutyramido-3-methyl-3-phenylbutanoyl)-6,6-dimethyl-3-azabicyclo[3.1.0]hexane-2-carboxamide;

(1*R*,2*S*,5*S*)-*N*-(4-(Azetidin-1-yl)-1-cyclopropyl-3,4-dioxobutan-2-yl)-3-((*S*)-2-isobutyramido-3,3-dimethylbutanoyl)-6,6-dimethyl-3-azabicyclo[3.1.0]hexane-2-carboxamide;

(1*R*,2*S*,5*S*)-3-((Cyclopropanecarbonyl)-*L*-valyl)-*N*-(1-cyclopropyl-4-(cyclopropylamino)-3,4-dioxobutan-2-yl)-6,6-dimethyl-3-azabicyclo[3.1.0]hexane-2-carboxamide;

(1*R*,2*S*,5*S*)-*N*-(4-Amino-1-cyclopropyl-3,4-dioxobutan-2-yl)-3-(2-isobutyramido-2-(tetrahydrofuran-3-yl)acetyl)-6,6-dimethyl-3-azabicyclo[3.1.0]hexane-2-carboxamide;

(1*R*,2*S*,5*S*)-*N*-(1-Cyclopropyl-4-(((*S*)-2,2-dimethylcyclopropyl)amino)-3,4-dioxobutan-2-yl)-3-((*S*)-2-isobutyramido-3,3-dimethylbutanoyl)-6,6-dimethyl-3-azabicyclo[3.1.0]hexane-2-carboxamide;

(1*R*,2*S*,5*S*)-*N*-(4-Amino-1-cyclopropyl-3,4-dioxobutan-2-yl)-3-(isobutyryl-*L*-phenylalanyl)-6,6-dimethyl-3-azabicyclo[3.1.0]hexane-2-carboxamide;

(1*R*,2*S*,5*S*)-*N*-(4-Amino-1-cyclopropyl-3,4-dioxobutan-2-yl)-3-((*S*)-3,3-dimethyl-2-(3,3,3-trifluoro-2-(trifluoromethyl)propanamido)butanoyl)-6,6-dimethyl-3-azabicyclo[3.1.0]hexane-2-carboxamide;

(1*R*,2*S*,5*S*)-*N*-(4-Amino-1-cyclopropyl-3,4-dioxobutan-2-yl)-3-((*S*)-3,3-dimethyl-2-(2,2,2-trifluoroacetamido)butanoyl)-6,6-dimethyl-3-azabicyclo[3.1.0]hexane-2-carboxamide;

(1*R*,2*S*,5*S*)-*N*-(4-(Azetidin-1-yl)-1-cyclopropyl-3,4-dioxobutan-2-yl)-3-((*S*)-3,3-dimethyl-2-(2,2,2-trifluoroacetamido)butanoyl)-6,6-dimethyl-3-azabicyclo[3.1.0]hexane-2-carboxamide;

or a salt thereof.

13. The compound according to any one of claims 1 to 12 having SARS-CoV-2 Mpro inhibitor activity.

14. A pharmaceutical composition comprising a compound as defined in any one of claims 1 to 13 and a pharmaceutically acceptable excipient.

15. Use of the compound or composition according to any one of claims 1 to 14 in the manufacture of a medicament for the treatment of SARS-CoV-2 or in the treatment of disorders associated with SARS-CoV-2.