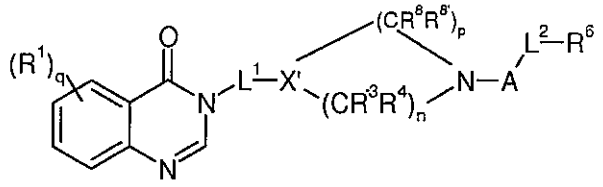
Claims

1. A compound of formula (I'):



(I')

wherein

- R^1, each identical or different, is chosen from the group consisting of halogen, R, OR, NRR', CN, CF_3, C(O)R, C(O)OR, C(O)NRR', NO_2, (C_1-C_6)alkylene-OR, (C_1-C_6)alkylene-NRR', (C_1-C_6)alkylene-CO_2R, (C_1-C_6)alkylene-CONRR', -O-(C_1-C_6)alkylene-CO_2R, -O-(C_1-C_6)alkylene-CONRR', CO_2-(C_1-C_6)alkylene-OR, CO_2-(C_1-C_6)alkylene-NRR', C(O)NH-(C_1-C_6)alkylene-OR, CONH-(C_1-C_6)alkylene-NRR', OCF_3, SO_2R, SO_3H, SO_2NRR', $NHSO_2$R, $R^{10}C{\equiv}CR^{11}$, $(R^{10})(R^{11})C{=}C(R^{11})_2$, ($C_1$-$C_6$)alkylene-COR, NHCOR, or (C_1-C_6)alkyl interrupted by at least one heteroatom, preferably chosen among O, N or S, preferably O;
- L^1 is linear or branched (C_1-C_6)alkylene optionally substituted by one or more of =O, CN, C(O)R, C(O)OR, or C(O)NRR', or linear or branched CH_2(C_1-C_6)alkylene, wherein the later (C_1-C_6)alkylene is optionally substituted by one or more of halogen, OR, NRR' or CF_3;
- q is 0, 1, 2, 3 or 4
- X' is CR^7;
- R^7 is OR, halogen, linear or branched (C_1-C_6)alkyl-OR, C(O)OR, C(O)NRR', CN, OR^9, NRR' or SR;
- n is 0,1 or 2;
- p is 1, 2 or 3;
- R^3, R^4, $R^{8'}$ and R^8, each identical or different, are chosen in the group consisting of H, linear or branched (C_1-C_6)alkyl, halogen, OH, -O-(C_1-C_6)alkyl, NRR', CN, CF_3, OR, C(O)R, C(O)OR or C(O)NRR';
- A is chosen from the group consisting of :
  - -C(O)-;
  - -C(O)NH-;
  - SO_2-; or
  - SO_2N-;

- L^2 is linear or branched (C_1-C_6)alkylene-O or a linear or branched (C_1-C_6)alkylene optionally interrupted by at least one heteroatom chosen from O, NR or S and/or optionally substituted by : R, OR, NRR', (C_1-C_6)alkyl-OR, (C_1-C_6)alkyl-NRR', OC(O)R, NHC(O)R, NHC(O)NRR', CN, C(=NH)NHOR;
- R^6 is chosen from the group consisting in aryl, heteroaryl, cycloalkyl, heterocycle, H, wherein the aryl, heteroaryl, cycloalkyl or heterocycle is mono or polycyclic and is optionally substituted by one or more of linear or branched (C_1-C_6)alkyl, halogen, NRR', CN, CF_3, OR, =O, C(O)R, C(O)OR, NHC(O)R, OC(O)R, linear or branched (C_2-C_6)alkenylene or C(O)NRR';
- each R and R', identical or different, are independently chosen from H, linear or branched (C_1-C_6)alkyl, cycloalkyl, aryl, aromatic or non aromatic heterocycle, linear or branched -(C_1-C_6)alkyl-aryl or linear or branched -(C_1-C_6)alkyl-heterocycle, wherein the heterocycle is aromatic or non aromatic; optionally substituted or not by OH, CO_2H, $C(O)NH_2$, NH_2
- R^9 is chosen from the group consisting of –C(O)R, -C(O)NHR, -C(O)OR, -$C(O)CH_2$-NRR', -C(O)-CH_2-CH_2-CO_2R, -C(O)-CH_2-SO_3H, -C(O)-(C_5H_4N), -PO_3H_2, or their ionized form;
- R^{10} independently is chosen from a bond, a linear or branched (C_1-C_6)alkyl;
- R^{11} independently is chosen from an hydrogen atom, a linear or branched (C_1-C_6)alkyl or an aryl, the alkyl or aryl is optionally substituted by OH, NH_2, C(O)OH or C(O)NH;

or their pharmaceutically acceptable salts or their optical isomers, racemates, diastereoisomers, enantiomers or tautomers.

2. The compound according to claim 1, wherein A is C=O.

3. The compound according to claim 1 or 2, wherein R^7 is OR, OR^9, NRR' or SR.

4. The compound according to claim 1 to 2, wherein R^7 is OH or OR^9.

5. The compound according to claim 1 to 2, wherein R^7 is OH.

6. The compound according to anyone of claims 1 to 5, wherein R^1, each identical or different, is chosen from the group consisting of linear or branched (C_1-C_6)alkyl, halogen, OR, NRR', CN, CF_3, C(O)R, C(O)OR, C(O)NRR' or NHC(O)R.

7. The compound according to anyone of claims 1 to 6, wherein R^1, each identical or different, is chosen from the group consisting of linear or branched C_1-C_6(alkyl), halogen, OH or linear or branched -O-(C_1-C_6)alkyl.

8. The compound according to anyone of claims 1 to 7, wherein R^3, R^4, R^8, $R^{8'}$, each identical or different, are chosen in the group consisting of H, -O-(C_1-C_6)alkyl, OH.

9. The compound according to anyone of claims 1 to 8, wherein L^2 is linear or branched C_1-C_6(alkylene) or linear or branched -[C_1-C_6(alkylene)]-O-.

10. The compound according to anyone of claims 1 to 9, wherein R^6 is chosen from the group consisting in aryl, heteroaryl, cycloalkyl or H, wherein the aryl, heteroaryl or cycloalkyl is optionally substituted by halogen, linear or branched O-(C_1-C_6)alkyl.

11. The compound according to anyone of claims 1 to 10, wherein p+n = 4.

12. The compound according to anyone of claims 1 to 11, wherein p is 2 and n is 2.

13. The compound according to anyone of claims 1 to 12, wherein L^1 is CH_2.

14. The compound according to any one of claims 1 to 13, chosen in the group consisting of:

3-({4-hydroxy-1-[3-(2-methoxyphenyl)propanoyl]piperidin-4-yl}methyl)-3,4-dihydroquinazolin-4-one

7-chloro-3-{[1-(2-ethylbutanoyl)-4-hydroxypiperidin-4-yl]methyl}-3,4-dihydroquinazolin-4-one

3-({1-[2-(3-fluorophenoxy)acetyl]-4-hydroxypiperidin-4-yl}methyl)-3,4-dihydroquinazolin-4-one

3-{[4-hydroxy-1-(2-methylpropanoyl)piperidin-4-yl]methyl}-6,7-dimethoxy-3,4-dihydroquinazolin-4-one

3-{[4-hydroxy-1-(2-methylpropanoyl)piperidin-4-yl]methyl}-3,4-dihydroquinazolin-4-one

4-hydroxy-1-[2-methyl-3-(thiophen-2-yl)propanoyl]piperidin-4-yl}methyl)-3,4-dihydroquinazolin-4-one

7-chloro-3-{[1-(3-cyclopentylpropanoyl)-4-hydroxypiperidin-4-yl]methyl}-3,4-dihydroquinazolin-4-one

3-{[1-(3-cyclopentylpropanoyl)-4-hydroxypiperidin-4-yl]methyl}-3,4-dihydroquinazolin-4-one

7-chloro-3-{[4-hydroxy-1-(3-phenylpropanoyl)piperidin-4-yl]methyl}-3,4-dihydroquinazolin-4-one

3-{[4-hydroxy-1-(3-phenylpropanoyl)piperidin-4-yl]methyl}-3,4-dihydroquinazolin-4-one

7-chloro-3-{[4-hydroxy-1-[2-methyl-3-(thiophen-2-yl)propanoyl]piperidin-4-yl}methyl)-3,4-dihydroquinazolin-4-one

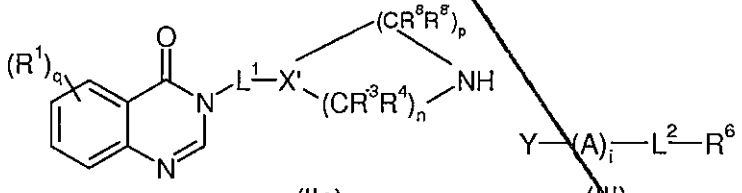
3-({4-hydroxy-1-[3-(thiophen-2-yl)propanoyl]piperidin-4-yl}methyl)-3,4-dihydroquinazolin-4-one

3-{[1-(2-benzylpropanoyl)-4-hydroxypiperidin-4-yl]methyl}-3,4-dihydroquinazolin-4-one

3-{[1-(2-benzylpropanoyl)-4-hydroxypiperidin-4-yl]methyl}-7-chloro-3,4-dihydroquinazolin-4-one

or their pharmaceutically acceptable salts or their optical isomers, racemates, diastereoisomers, enantiomers or tautomers.

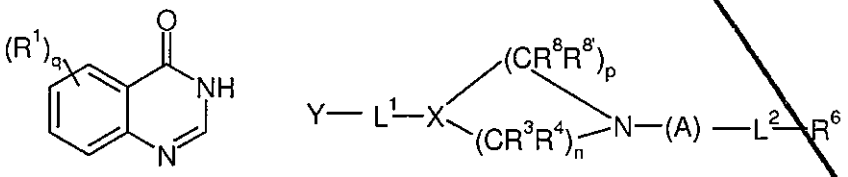
15.- A process for preparing a compound according to claims 1 to 14 comprising the reaction of a compound of formula (II) with a compound of formula (III)



(IIa) (III) ,

wherein R^1, R^8, R^3, R^4, R^5, R^6, L^1, L^2, X', A, q, n et i are defined as in anyone of claims 1 to 13, Y is a leaving group.

16.- A process for preparing a compound according to claims 1 to 14 comprising the reaction of a compound of formula (IV) with a compound of formula (V)



(IV) (Va)

wherein R^1, R^8, R^3, R^4, R^5, R^6, L^1, L^2, X, q, n et i are defined as in anyone of claims 1 to 13 and Y is a leaving group chosen from epoxy, halogen, activated OH.

17.- A pharmaceutical composition comprising a compound of formula (I) according to claims 1 to 14 with a pharmaceutical acceptable excipient.

18. Use of a compound of formula (I) as defined in anyone of claims 1 to 14 for inhibiting a deubiquitinating enzyme.

19. The use for use according to claim 18 for inhibiting USP7 (Ubiquitin Specific Protease 7)/HAUSP (Herpes Associated Ubiquitin Specific Protease).

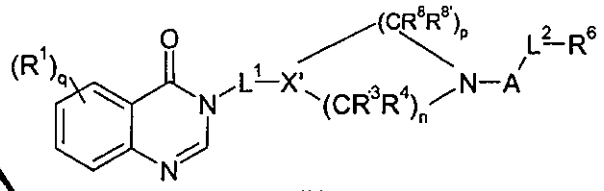
20. A compound according to anyone of claims 1 to 14 for use for treating and/or preventing cancer and metastasis, neurodegenerative diseases, such as Alzheimer's disease and Parkinson's disease, immunological disorders, diabetes, bone and joint diseases, osteoporosis, arthritis inflammatory disorders, cardiovascular diseases, viral infections and diseases, and/or viral infectivity and/or latency, bacterial infections and diseases.

21. The compound for use according to claim 20, wherein said viral infections and diseases are chosen from herpes simplex-1 or -2 viral infections, hepatitis A, hepatitis C, SARS coronavirus infection and disease, Epstein-Barr virus, rhinoviral infections and diseases, adenoviral infections and diseases, poliomyelitis.

22. A combination comprising a compound of formula (I) as defined in anyone of claims 1 to 14, with one or more active agents chosen from anti-cancer agents, neurological agents, thrombolytic agents, antioxidant agents, anti-diabetes agents, anti-infective, anti-hypertensive agents, diuretic agents, thrombolytic agents, immunosuppressive agents, cardiovascular agents, immunomodulatory agents, anti-inflammatory agents, antiviral agents, anti-bacterial agents.

AMENDED CLAIMS
received by the International Bureau on 20 February 2013 (20.02.2013)

1.- A compound of formula (I'):



(I')

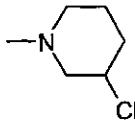
wherein

- R^1, each identical or different, is chosen from the group consisting of halogen, R, OR, NRR', CN, CF_3, C(O)R, C(O)OR, C(O)NRR', NO_2, $(C_1$-$C_6)$alkylene-OR, $(C_1$-$C_6)$alkylene-NRR', $(C_1$-$C_6)$alkylene-CO_2R, $(C_1$-$C_6)$alkylene-CONRR', -O-$(C_1$-$C_6)$alkylene-CO_2R, -O-$(C_1$-$C_6)$alkylene-CONRR', CO_2-$(C_1$-$C_6)$alkylene-OR, CO_2-$(C_1$-$C_6)$alkylene-NRR', C(O)NH-$(C_1$-$C_6)$alkylene-OR, CONH-$(C_1$-$C_6)$alkylene-NRR', OCF_3, SO_2R, SO_3H, SO_2NRR', NHSO$_2$R, $R^{10}C{\equiv}CR^{11}$, $(R^{10})(R^{11})C{=}C(R^{11})_2$, $(C_1$-$C_6)$alkylene-COR, NHCOR, or $(C_1$-$C_6)$alkyl interrupted by at least one heteroatom, preferably chosen among O, N or S, preferably O;
- L^1 is linear or branched $(C_1$-$C_6)$alkylene optionally substituted by one or more of =O, CN, C(O)R, C(O)OR, or C(O)NRR', or linear or branched $CH_2(C_1$-$C_6)$alkylene, wherein the later $(C_1$-$C_6)$alkylene is optionally substituted by one or more of halogen, OR, NRR' or CF_3;
- q is 0, 1, 2, 3 or 4
- X' is CR^7;
- R^7 is OR, halogen, linear or branched $(C_1$-$C_6)$alkyl-OR, C(O)OR, C(O)NRR', CN, OR^9, NRR' or SR;
- n is 0,1 or 2;
- p is 1, 2 or 3;
- R^3, R^4, $R^{8'}$ and R^8, each identical or different, are chosen in the group consisting of H, linear or branched $(C_1$-$C_6)$alkyl, halogen, OH, -O-$(C_1$-$C_6)$alkyl, NRR', CN, CF_3, OR, C(O)R, C(O)OR or C(O)NRR';
- A is chosen from the group consisting of :
  - -C(O)-;
  - -C(O)NH-;
  - SO_2-; or
  - SO_2N-;

- L^2 is linear or branched (C_1-C_6)alkylene optionally interrupted by at least one heteroatom chosen from O, NR or S and/or optionally substituted by : R, OR, NRR', (C_1-C_6)alkyl-OR, (C_1-C_6)alkyl-NRR', OC(O)R, NHC(O)R, NHC(O)NRR', CN, C(=NH)NHOR;
- R^6 is chosen from the group consisting in aryl, heteroaryl, cycloalkyl, heterocycle, H, wherein the aryl, heteroaryl, cycloalkyl or heterocycle is mono or polycyclic and is optionally substituted by one or more of linear or branched (C_1-C_6)alkyl, halogen, NRR', CN, CF_3, OR, =O, C(O)R, C(O)OR, NHC(O)R, OC(O)R, linear or branched (C_2-C_6)alkenylene or C(O)NRR';
- each R and R', identical or different, are independently chosen from H, linear or branched (C_1-C_6)alkyl, cycloalkyl, aryl, aromatic or non aromatic heterocycle, linear or branched -(C_1-C_6)alkyl-aryl or linear or branched -(C_1-C_6)alkyl-heterocycle, wherein the heterocycle is aromatic or non aromatic; optionally substituted or not by OH, CO_2H, $C(O)NH_2$, NH_2
- R^9 is chosen from the group consisting of –C(O)R, -C(O)NHR, -C(O)OR, -$C(O)CH_2$-NRR', -C(O)-CH_2-CH_2-CO_2R, -C(O)-CH_2-SO_3H, -C(O)-(C_5H_4N), -PO_3H_2, or their ionized form;
- R^{10} independently is chosen from a bond, a linear or branched (C_1-C_6)alkyl;
- R^{11} independently is chosen from an hydrogen atom, a linear or branched (C_1-C_6)alkyl or an aryl, the alkyl or aryl is optionally substituted by OH, NH_2, C(O)OH or C(O)NH;

or their pharmaceutically acceptable salts or their optical isomers, racemates, diastereoisomers, enantiomers or tautomers,

with the exception of

- q is 0, L^1 is CH_2, X' is CR^7 and R^7 is OH, i is 1, A is C=O, L^2 is C_2H_4 and R^6 is ;
- q is 1, R^1 is Cl at position 7, L^1 is CH_2, X' is CR^7 and R^7 is OH, i is 1, A is C=O, L^2R^6 is $CH(CH_2CH_3)_2$.

2. The compound according to claim 1, wherein A is C=O.

3. The compound according to claim 1 or 2, wherein R^7 is OR, OR^9, NRR' or SR.

4. The compound according to claim 1 to 2, wherein R^7 is OH or OR^9.

5. The compound according to claim 1 to 2, wherein R^7 is OH.

6. The compound according to anyone of claims 1 to 5, wherein R^1, each identical or different, is chosen from the group consisting of linear or branched (C_1-C_6)alkyl, halogen, OR, NRR', CN, CF_3, C(O)R, C(O)OR, C(O)NRR' or NHC(O)R.

7. The compound according to anyone of claims 1 to 6, wherein R^1, each identical or different, is chosen from the group consisting of linear or branched C_1-C_6(alkyl), halogen, OH or linear or branched -O-(C_1-C_6)alkyl.

8. The compound according to anyone of claims 1 to 7, wherein R^3, R^4, R^8, $R^{8'}$, each identical or different, are chosen in the group consisting of H, -O-(C_1-C_6)alkyl, OH.

9. The compound according to anyone of claims 1 to 8, wherein L^2 is linear or branched C_1-C_6(alkylene) or linear or branched -[C_1-C_6(alkylene)]-O-.

10. The compound according to anyone of claims 1 to 9, wherein R^6 is chosen from the group consisting in aryl, heteroaryl, cycloalkyl or H, wherein the aryl, heteroaryl or cycloalkyl is optionally substituted by halogen, linear or branched O-(C_1-C_6)alkyl.

11. The compound according to anyone of claims 1 to 10, wherein p+n = 4.

12. The compound according to anyone of claims 1 to 11, wherein p is 2 and n is 2.

13. The compound according to anyone of claims 1 to 12, wherein L^1 is CH_2.

14. The compound according to any one of claims 1 to 13, chosen in the group consisting of:

3-({4-hydroxy-1-[3-(2-methoxyphenyl)propanoyl]piperidin-4-yl}methyl)-3,4-dihydroquinazolin-4-one

3-({1-[2-(3-fluorophenoxy)acetyl]-4-hydroxypiperidin-4-yl}methyl)-3,4-dihydroquinazolin-4-one

3-{[4-hydroxy-1-(2-methylpropanoyl)piperidin-4-yl]methyl}-6,7-dimethoxy-3,4-dihydroquinazolin-4-one

3-{[4-hydroxy-1-(2-methylpropanoyl)piperidin-4-yl]methyl}-3,4-dihydroquinazolin-4-one

4-hydroxy-1-([2-methyl-3-(thiophen-2-yl)propanoyl]piperidin-4-yl}methyl)-3,4-dihydroquinazolin-4-one

7-chloro-3-{[1-(3-cyclopentylpropanoyl)-4-hydroxypiperidin-4-yl]methyl}-3,4-dihydroquinazolin-4-one

3-{[1-(3-cyclopentylpropanoyl)-4-hydroxypiperidin-4-yl]methyl}-3,4-dihydroquinazolin-4-one

7-chloro-3-{[4-hydroxy-1-(3-phenylpropanoyl)piperidin-4-yl]methyl}-3,4-dihydroquinazolin-4-one

3-{[4-hydroxy-1-(3-phenylpropanoyl)piperidin-4-yl]methyl}-3,4-dihydroquinazolin-4-one

7-chloro-3-({4-hydroxy-1-[2-methyl-3-(thiophen-2-yl)propanoyl]piperidin-4-yl}methyl)-3,4-dihydroquinazolin-4-one

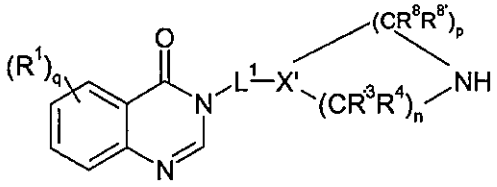
3-({4-hydroxy-1-[3-(thiophen-2-yl)propanoyl]piperidin-4-yl}methyl)-3,4-dihydroquinazolin-4-one

3-{[1-(2-benzylpropanoyl)-4-hydroxypiperidin-4-yl]methyl}-3,4-dihydroquinazolin-4-one

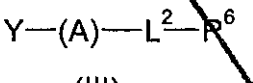
3-{[1-(2-benzylpropanoyl)-4-hydroxypiperidin-4-yl]methyl}-7-chloro-3,4-dihydroquinazolin-4-one

or their pharmaceutically acceptable salts or their optical isomers, racemates, diastereoisomers, enantiomers or tautomers.

15.- A process for preparing a compound according to claims 1 to 14 comprising the reaction of a compound of formula (II) with a compound of formula (III)



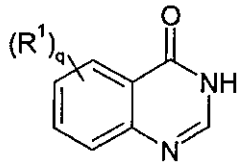
(IIa)



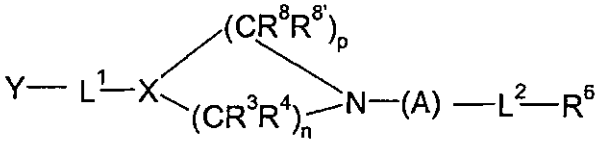
(III)

wherein R^1, R^8, R^3, R^4, R^5, R^6, L^1, L^2, X', A, q, n are defined as in anyone of claims 1 to 13, Y is a leaving group.

16.- A process for preparing a compound according to claims 1 to 14 comprising the reaction of a compound of formula (IV) with a compound of formula (V)



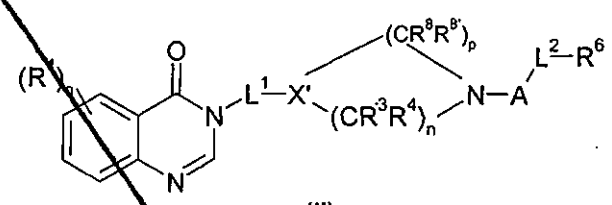
(IV)



(Va)

wherein R^1, R^8, R^3, R^4, R^5, R^6, L^1, L^2, X, q, n are defined as in anyone of claims 1 to 13 and Y is a leaving group chosen from epoxy, halogen, activated OH.

17.- A pharmaceutical composition comprising a compound of formula (I')



(I')

wherein

- R^1, each identical or different, is chosen from the group consisting of halogen, R, OR, NRR', CN, CF_3, C(O)R, C(O)OR, C(O)NRR', NO_2, $(C_1$-$C_6)$alkylene-OR, $(C_1$-$C_6)$alkylene-NRR', $(C_1$-$C_6)$alkylene-CO_2R, $(C_1$-$C_6)$alkylene-CONRR', -O-$(C_1$-$C_6)$alkylene-CO_2R, -O-$(C_1$-$C_6)$alkylene-CONRR', CO_2-$(C_1$-$C_6)$alkylene-OR, CO_2-$(C_1$-$C_6)$alkylene-NRR', C(O)NH-$(C_1$-$C_6)$alkylene-OR, CONH-$(C_1$-$C_6)$alkylene-NRR', OCF_3, SO_2R, SO_3H, SO_2NRR', $NHSO_2$R, $R^{10}C{\equiv}CR^{11}$, $(R^{10})(R^{11})C{=}C(R^{11})_2$, $(C_1$-$C_6)$alkylene-COR, NHCOR, or $(C_1$-$C_6)$alkyl interrupted by at least one heteroatom, preferably chosen among O, N or S, preferably O;
- L^1 is linear or branched $(C_1$-$C_6)$alkylene optionally substituted by one or more of =O, CN, C(O)R, C(O)OR, or C(O)NRR', or linear or branched $CH_2(C_1$-$C_6)$alkylene, wherein the later $(C_1$-$C_6)$alkylene is optionally substituted by one or more of halogen, OR, NRR' or CF_3;
- q is 0, 1, 2, 3 or 4
- X' is CR^7;
- R^7 is OR, halogen, linear or branched $(C_1$-$C_6)$alkyl-OR, C(O)OR, C(O)NRR', CN, OR^9, NRR' or SR;
- n is 0,1 or 2;
- p is 1, 2 or 3;
- R^3, R^4, $R^{8'}$ and R^8, each identical or different, are chosen in the group consisting of H, linear or branched $(C_1$-$C_6)$alkyl, halogen, OH, -O-$(C_1$-$C_6)$alkyl, NRR', CN, CF_3, OR, C(O)R, C(O)OR or C(O)NRR';

- A is chosen from the group consisting of :
  - -C(O)-;
  - -C(O)NH-;
  - SO_2-; or
  - SO_2NH-;
- L^2 is linear or branched (C_1-C_6)alkylene optionally interrupted by at least one heteroatom chosen from O, NR or S and/or optionally substituted by : R, OR, NRR', (C_1-C_6)alkyl-OR, (C_1-C_6)alkyl-NRR', OC(O)R, NHC(O)R, NHC(O)NRR', CN, C(=NH)NHOR
- R^6 is chosen from the group consisting in aryl, heteroaryl, cycloalkyl, heterocycle, H, wherein the aryl, heteroaryl, cycloalkyl or heterocycle is mono or polycyclic and is optionally substituted by one or more of linear or branched (C_1-C_6)alkyl, halogen, NRR', CN, CF_3, OR, =O, C(O)R, C(O)OR, NHC(O)R, OC(O)R, linear or branched (C_2-C_6)alkenylene or C(O)NRR';
- each R and R', identical or different, are independently chosen from H, linear or branched (C_1-C_6)alkyl, cycloalkyl, aryl, aromatic or non aromatic heterocycle, linear or branched -(C_1-C_6)alkyl-aryl or linear or branched -(C_1-C_6)alkyl-heterocycle, wherein the heterocycle is aromatic or non aromatic; optionally substituted or not by OH, CO_2H, $C(O)NH_2$, NH_2
- R^9 is chosen from the group consisting of –C(O)R, -C(O)NHR, -C(O)OR, -$C(O)CH_2$-NRR', -C(O)-CH_2-CH_2-CO_2R, -C(O)-CH_2-SO_3H, -C(O)-(C_5H_4N), -PO_3H_2, or their ionized form;
- R^{10} independently is chosen from a bond, a linear or branched (C_1-C_6)alkyl;
- R^{11} independently is chosen from an hydrogen atom, a linear or branched (C_1-C_6)alkyl or an aryl, the alkyl or aryl is optionally substituted by OH, NH_2, C(O)OH or C(O)NH;

or their pharmaceutically acceptable salts or their optical isomers, racemates, diastereoisomers, enantiomers or tautomers,
with a pharmaceutical acceptable excipient.

18. A pharmaceutical composition according to claim 17 wherein L^2 is linear or branched (C_1-C_6)alkylene-O or a linear or branched (C_1-C_6)alkylene optionally interrupted by at least one heteroatom chosen from O, NR or S and/or optionally substituted by : R, OR, NRR', (C_1-C_6)alkyl-OR, (C_1-C_6)alkyl-NRR', OC(O)R, NHC(O)R, NHC(O)NRR', CN, C(=NH)NHOR

19.- A pharmaceutical composition according to claim 17 or 18 wherein R^1, R^8, R^3, R^4, R^5, R^6, L^1, L^2, X, q, n are defined as in anyone of claims 2 to 13.

20.- A pharmaceutical composition according to claim 17 to 19 wherein the compound of formula (I') is chosen in the group consisting of:

3-({4-hydroxy-1-[3-(2-methoxyphenyl)propanoyl]piperidin-4-yl}methyl)-3,4-dihydroquinazolin-4-one

7-chloro-3-{[1-(2-ethylbutanoyl)-4-hydroxypiperidin-4-yl]methyl}-3,4-dihydroquinazolin-4-one

3-({1-[2-(3-fluorophenoxy)acetyl]-4-hydroxypiperidin-4-yl}methyl)-3,4-dihydroquinazolin-4-one

3-{[4-hydroxy-1-(2-methylpropanoyl)piperidin-4-yl]methyl}-6,7-dimethoxy-3,4-dihydroquinazolin-4-one

3-{[4-hydroxy-1-(2-methylpropanoyl)piperidin-4-yl]methyl}-3,4-dihydroquinazolin-4-one

4-hydroxy-1-([2-methyl-3-(thiophen-2-yl)propanoyl]piperidin-4-yl}methyl)-3,4-dihydroquinazolin-4-one

7-chloro-3-{[1-(3-cyclopentylpropanoyl)-4-hydroxypiperidin-4-yl]methyl}-3,4-dihydroquinazolin-4-one

3-{[1-(3-cyclopentylpropanoyl)-4-hydroxypiperidin-4-yl]methyl}-3,4-dihydroquinazolin-4-one

7-chloro-3-{[4-hydroxy-1-(3-phenylpropanoyl)piperidin-4-yl]methyl}-3,4-dihydroquinazolin-4-one

3-{[4-hydroxy-1-(3-phenylpropanoyl)piperidin-4-yl]methyl}-3,4-dihydroquinazolin-4-one

7-chloro-3-({4-hydroxy-1-[2-methyl-3-(thiophen-2-yl)propanoyl]piperidin-4-yl}methyl)-3,4-dihydroquinazolin-4-one

3-({4-hydroxy-1-[3-(thiophen-2-yl)propanoyl]piperidin-4-yl}methyl)-3,4-dihydroquinazolin-4-one

3-{[1-(2-benzylpropanoyl)-4-hydroxypiperidin-4-yl]methyl}-3,4-dihydroquinazolin-4-one

3-{[1-(2-benzylpropanoyl)-4-hydroxypiperidin-4-yl]methyl}-7-chloro-3,4-dihydroquinazolin-4-one

or their pharmaceutically acceptable salts or their optical isomers, racemates, diastereoisomers, enantiomers or tautomers.

21. Use of a compound of formula (I') as defined in anyone of claims 17 to 20 for inhibiting a deubiquitinating enzyme.

22. The use for use according to claim 21 for inhibiting USP7 (Ubiquitin Specific Protease 7)/HAUSP (Herpes Associated Ubiquitin Specific Protease).

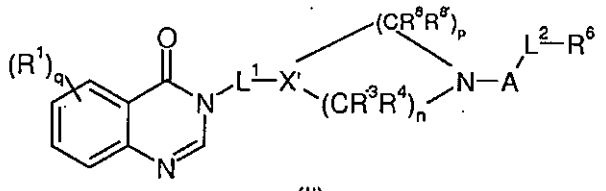
23. A compound according to anyone of claims 17 to 20 for use for treating and/or preventing cancer and metastasis, neurodegenerative diseases, such as Alzheimer's disease and Parkinson's disease, immunological disorders, diabetes, bone and joint diseases, osteoporosis, arthritis inflammatory disorders, cardiovascular diseases, viral infections and diseases, and/or viral infectivity and/or latency, bacterial infections and diseases.

24. The compound for use according to claim 22, wherein said viral infections and diseases are chosen from herpes simplex-1 or -2 viral infections, hepatitis A, hepatitis C, SARS coronavirus infection and disease, Epstein-Barr virus, rhinoviral infections and diseases, adenoviral infections and diseases, poliomyelitis.

25. A combination comprising a compound of formula (I') as defined in anyone of claims 17 to 20, with one or more active agents chosen from anti-cancer agents, neurological agents, thrombolytic agents, antioxidant agents, anti-diabetes agents, anti-infective, anti-hypertensive agents, diuretic agents, thrombolytic agents, immunosuppressive agents, cardiovascular agents, immunomodulatory agents, anti-inflammatory agents, antiviral agents, anti-bacterial agents.

Claims

1.- A compound of formula (I'):



(I')

wherein

- R^1, each identical or different, is chosen from the group consisting of halogen, R, OR, NRR', CN, CF_3, C(O)R, C(O)OR, C(O)NRR', NO_2, (C_1-C_6)alkylene-OR, (C_1-C_6)alkylene-NRR', (C_1-C_6)alkylene-CO_2R, (C_1-C_6)alkylene-CONRR', -O-(C_1-C_6)alkylene-CO_2R, -O-(C_1-C_6)alkylene-CONRR', CO_2-(C_1-C_6)alkylene-OR, CO_2-(C_1-C_6)alkylene-NRR', C(O)NH-(C_1-C_6)alkylene-OR, CONH-(C_1-C_6)alkylene-NRR', OCF_3, SO_2R, SO_3H, SO_2NRR', $NHSO_2$R, $R^{10}C{\equiv}CR^{11}$, $(R^{10})(R^{11})C{=}C(R^{11})_2$, ($C_1$-$C_6$)alkylene-COR, NHCOR, or (C_1-C_6)alkyl interrupted by at least one heteroatom chosen from O, N and S;
- L^1 is CH_2;
- q is 0, 1, 2, 3 or 4
- X' is CR^7;
- R^7 is OR;
- n is1 or 2;
- p is 1, 2 or 3;
- R^3, R^4, $R^{8'}$ and R^8, each identical or different, are chosen in the group consisting of H, linear or branched (C_1-C_6)alkyl, halogen, OH, -O-(C_1-C_6)alkyl, NRR', CN, CF_3, OR, C(O)R, C(O)OR or C(O)NRR';
- A is chosen from the group consisting of :
  - -C(O)-;
  - -C(O)NH-;
- L^2 is linear or branched (C_1-C_6)alkylene optionally interrupted by at least one heteroatom chosen from O, NR or S and/or optionally substituted by : R, OR, NRR', (C_1-C_6)alkyl-OR, (C_1-C_6)alkyl-NRR', OC(O)R, NHC(O)R, NHC(O)NRR', CN, C(=NH)NHOR;
- R^6 is chosen from the group consisting in aryl, heteroaryl, cycloalkyl, heterocycle, H, wherein the aryl, heteroaryl, cycloalkyl or heterocycle is mono or polycyclic and is optionally substituted by one or more of linear or branched (C_1-C_6)alkyl, halogen,

NRR', CN, CF_3, OR, =O, C(O)R, C(O)OR, NHC(O)R, OC(O)R, linear or branched $(C_2$-$C_6)$alkenylene or C(O)NRR';

- each R and R', identical or different, are independently chosen from H, linear or branched $(C_1$-$C_6)$alkyl, cycloalkyl, aryl, aromatic or non aromatic heterocycle, linear or branched -$(C_1$-$C_6)$alkyl-aryl or linear or branched -$(C_1$-$C_6)$alkyl-heterocycle, wherein the heterocycle is aromatic or non aromatic; optionally substituted or not by OH, CO_2H, $C(O)NH_2$, NH_2
- R^{10} independently is chosen from a bond, a linear or branched $(C_1$-$C_6)$alkyl;
- R^{11} independently is chosen from an hydrogen atom, a linear or branched $(C_1$-$C_6)$alkyl or an aryl, the alkyl or aryl is optionally substituted by OH, NH_2, C(O)OH or C(O)NH;

where "aryl" refers to an aromatic monocyclic or multicyclic hydrocarbon ring system of 6 to 14 carbon atoms;

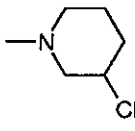
where "cycloalkyl" refers to a non-aromatic monocyclic or multicyclic hydrocarbon ring of 3 to 10 carbon atoms;

where "heteroaryl" refers to 5 to 14 aromatic hetero, mono-, bi- or multicyclic rings;

where "heterocycle" refers to a saturated, partially unsaturated or unsaturated non-aromatic stable 3 to 14 membered, mono-, bi- or multicyclic rings.

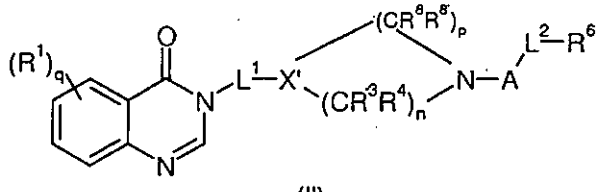
or their pharmaceutically acceptable salts or their optical isomers, racemates, diastereoisomers, enantiomers or tautomers,

with the exception of

- q is 0, L^1 is CH_2, X' is CR^7 and R^7 is OH, i is 1, A is C=O, L^2 is C_2H_4 and R^6 is ;

- q is 1, R^1 is Cl at position 7, L^1 is CH_2, X' is CR^7 and R^7 is OH, i is 1, A is C=O, L^2R^6 is $CH(CH_2CH_3)_2$.

2.- A compound of formula (I'):



(I')

wherein

- R^1, each identical or different, is chosen from the group consisting of halogen, linear or branched (C1-C6)alkyl, OR, NRR', CN, CF_3, C(O)R, C(O)OR, C(O)NRR', NO_2, (C_1-C_6)alkylene-OR, (C_1-C_6)alkylene-NRR', (C_1-C_6)alkylene-CO_2R, (C_1-C_6)alkylene-CONRR', -O-(C_1-C_6)alkylene-CO_2R, -O-(C_1-C_6)alkylene-CONRR', CO_2-(C_1-C_6)alkylene-OR, CO_2-(C_1-C_6)alkylene-NRR', C(O)NH-(C_1-C_6)alkylene-OR, CONH-(C_1-C_6)alkylene-NRR' or NHCOR;
- L^1 is CH_2;
- q is 0, 1, 2, 3 or 4
- X' is CR^7;
- R^7 is OR;
- n is 1 or 2;
- p is 1, 2 or 3;
- R^3, R^4, $R^{8'}$ and R^8, each identical or different, are chosen in the group consisting of H, linear or branched (C_1-C_6)alkyl, halogen, OH, -O-(C_1-C_6)alkyl, NRR', CN, CF_3, OR, C(O)R, C(O)OR or C(O)NRR';
- A is chosen from the group consisting of :
  - -C(O)-;
  - -C(O)NH-;

- L^2 is linear or branched (C_1-C_6)alkylene optionally interrupted by at least one heteroatom chosen from O, N or S and/or optionally substituted by : R, OR, NRR', (C_1-C_6)alkyl-OR, (C_1-C_6)alkyl-NRR', OC(O)R, NHC(O)R, NHC(O)NRR', CN, C(=NH)NHOR;
- R^6 is chosen from the group consisting in aryl, heteroaryl, cycloalkyl, heterocycle, H, wherein the aryl, heteroaryl, cycloalkyl or heterocycle is mono or polycyclic and is optionally substituted by one or more of linear or branched (C_1-C_6)alkyl, halogen, NRR', CN, CF_3, OR, C(O)R, C(O)OR, NHC(O)R, OC(O)R, or C(O)NRR';
- each R and R', identical or different, are independently chosen from H, linear or branched (C_1-C_6)alkyl, aryl, aromatic or non-aromatic heterocycle, linear or branched -(C_1-C_6)alkyl-aryl or linear or branched -(C_1-C_6)alkyl-heterocycle, wherein the heterocycle is aromatic or non-aromatic;

where "aryl" refers to an aromatic monocyclic or multicyclic hydrocarbon ring system of 6 to 14 carbon atoms;

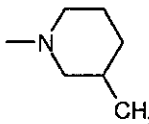
where "cycloalkyl" refers to a non-aromatic monocyclic or multicyclic hydrocarbon ring of 3 to 10 carbon atoms;

where "heteroaryl" refers to 5 to 14 aromatic hetero, mono-, bi- or multicyclic rings;

where "heterocycle" refers to a saturated, partially unsaturated or unsaturated non-aromatic stable 3 to 14 membered, mono-, bi- or multicyclic rings.

or their pharmaceutically acceptable salts or their optical isomers, racemates, diastereoisomers, enantiomers or tautomers,

with the exception of



- q is 0, L^1 is CH_2, X' is CR^7 and R^7 is OH, A is C=O, L^2 is C_2H_4 and R^6 is ;
- q is 1, R^1 is Cl at position 7, L^1 is CH_2, X' is CR^7 and R^7 is OH, A is C=O, L^2R^6 is $CH(CH_2CH_3)_2$.

3. The compound according to claim 1 or 2, wherein A is C=O.

4. The compound according to claim 1, 2 or 3, wherein R^7 is OH.

5. The compound according to anyone of claims 1 to 4, wherein R^1, each identical or different, is chosen from the group consisting of linear or branched (C_1-C_6)alkyl, halogen, OR, NRR', CN, CF_3, C(O)R, C(O)OR, C(O)NRR' or NHC(O)R.

6. The compound according to anyone of claims 1 to 4, wherein R^1, each identical or different, is chosen from the group consisting of linear or branched C_1-C_6(alkyl), halogen, OH or linear or branched -O-(C_1-C_6)alkyl.

7. The compound according to anyone of claims 1 to 6, wherein R^3, R^4, R^8, $R^{8'}$, each identical or different, are chosen in the group consisting of H, -O-(C_1-C_6)alkyl, OH.

8. The compound according to anyone of claims 1 to 7, wherein L^2 is linear or branched C_1-C_6(alkylene) or linear or branched -[C_1-C_6(alkylene)]-O-.

9. The compound according to anyone of claims 1 to 8, wherein R^6 is chosen from the group consisting in aryl, heteroaryl, cycloalkyl or H, wherein the aryl, heteroaryl or cycloalkyl is optionally substituted by halogen, linear or branched O-(C_1-C_6)alkyl.

10. The compound according to anyone of claims 1 to 9, wherein p+n = 4.

11. The compound according to anyone of claims 1 to 10, wherein p is 2 and n is 2.

12. The compound according to any one of claims 1 to 11, chosen in the group consisting of:

3-({4-hydroxy-1-[3-(2-methoxyphenyl)propanoyl]piperidin-4-yl}methyl)-3,4-dihydroquinazolin-4-one

3-({1-[2-(3-fluorophenoxy)acetyl]-4-hydroxypiperidin-4-yl}methyl)-3,4-dihydroquinazolin-4-one

3-{[4-hydroxy-1-(2-methylpropanoyl)piperidin-4-yl]methyl}-6,7-dimethoxy-3,4-dihydroquinazolin-4-one

3-{[4-hydroxy-1-(2-methylpropanoyl)piperidin-4-yl]methyl}-3,4-dihydroquinazolin-4-one

4-hydroxy-1-([2-methyl-3-(thiophen-2-yl)propanoyl]piperidin-4-yl}methyl)-3,4-dihydroquinazolin-4-one

7-chloro-3-{[1-(3-cyclopentylpropanoyl)-4-hydroxypiperidin-4-yl]methyl}-3,4-dihydroquinazolin-4-one

3-{[1-(3-cyclopentylpropanoyl)-4-hydroxypiperidin-4-yl]methyl}-3,4-dihydroquinazolin-4-one

7-chloro-3-{[4-hydroxy-1-(3-phenylpropanoyl)piperidin-4-yl]methyl}-3,4-dihydroquinazolin-4-one

3-{[4-hydroxy-1-(3-phenylpropanoyl)piperidin-4-yl]methyl}-3,4-dihydroquinazolin-4-one

7-chloro-3-({4-hydroxy-1-[2-methyl-3-(thiophen-2-yl)propanoyl]piperidin-4-yl}methyl)-3,4-dihydroquinazolin-4-one

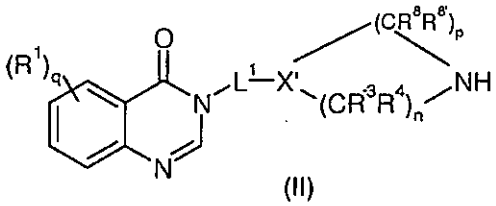
3-({4-hydroxy-1-[3-(thiophen-2-yl)propanoyl]piperidin-4-yl}methyl)-3,4-dihydroquinazolin-4-one

3-{[1-(2-benzylpropanoyl)-4-hydroxypiperidin-4-yl]methyl}-3,4-dihydroquinazolin-4-one

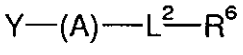
3-{[1-(2-benzylpropanoyl)-4-hydroxypiperidin-4-yl]methyl}-7-chloro-3,4-dihydroquinazolin-4-one

or their pharmaceutically acceptable salts or their optical isomers, racemates, diastereoisomers, enantiomers or tautomers.

13.- A process for preparing a compound according to claims 1 to 12 comprising the reaction of a compound of formula (II) with a compound of formula (III)



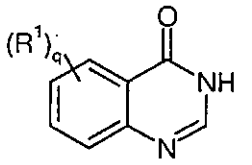
(II)



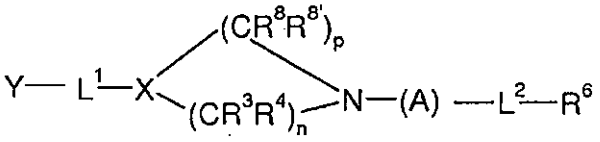
(III)

wherein R^1, R^8, R^3, R^4, R^5, R^6, L^1, L^2, X', A, q, n are defined as in anyone of claims 1 to 11, Y is a leaving group.

14.- A process for preparing a compound according to claims 1 to 12 comprising the reaction of a compound of formula (IV) with a compound of formula (V)



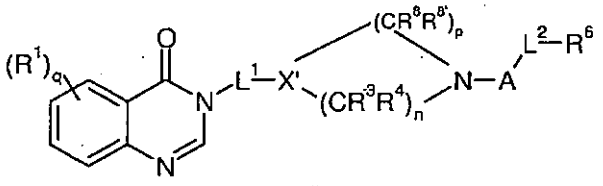
(IV)



(V)

wherein R^1, R^8, R^3, R^4, R^5, R^6, L^1, L^2, X, q, n are defined as in anyone of claims 1 to 11 and Y is a leaving group chosen from epoxy, halogen, activated OH.

15.- A pharmaceutical composition comprising a compound of formula (I')



(I')

wherein

- R^1, each identical or different, is chosen from the group consisting of halogen, R, OR, NRR', CN, CF_3, C(O)R, C(O)OR, C(O)NRR', NO_2, $(C_1$-$C_6)$alkylene-OR, $(C_1$-$C_6)$alkylene-NRR', $(C_1$-$C_6)$alkylene-CO_2R, $(C_1$-$C_6)$alkylene-CONRR', -O-$(C_1$-$C_6)$alkylene-CO_2R, -O-$(C_1$-$C_6)$alkylene-CONRR', CO_2-$(C_1$-$C_6)$alkylene-OR, CO_2-$(C_1$-$C_6)$alkylene-NRR', C(O)NH-$(C_1$-$C_6)$alkylene-OR, CONH-$(C_1$-$C_6)$alkylene-NRR', OCF_3, SO_2R, SO_3H, SO_2NRR', $NHSO_2$R, $R^{10}C{\equiv}CR^{11}$, $(R^{10})(R^{11})C{=}C(R^{11})_2$, $(C_1$-$C_6)$alkylene-COR, NHCOR, or $(C_1$-$C_6)$alkyl interrupted by at least one heteroatom, chosen among O, N or S;
- L^1 is CH_2;
- q is 0, 1, 2, 3 or 4
- X' is CR^7;
- R^7 is OR;

- n is1 or 2;
- p is 1, 2 or 3;
- R^3, R^4, $R^{8'}$ and R^8, each identical or different, are chosen in the group consisting of H, linear or branched (C_1-C_6)alkyl, halogen, OH, -O-(C_1-C_6)alkyl, NRR', CN, CF_3, OR, C(O)R, C(O)OR or C(O)NRR';
- A is chosen from the group consisting of :
  - -C(O)-;
  - -C(O)NH-;

- L^2 is linear or branched (C_1-C_6)alkylene optionally interrupted by at least one heteroatom chosen from O, NR or S and/or optionally substituted by : R, OR, NRR', (C_1-C_6)alkyl-OR, (C_1-C_6)alkyl-NRR', OC(O)R, NHC(O)R, NHC(O)NRR', CN, C(=NH)NHOR
- R^6 is chosen from the group consisting in aryl, heteroaryl, cycloalkyl, heterocycle, H, wherein the aryl, heteroaryl, cycloalkyl or heterocycle is mono or polycyclic and is optionally substituted by one or more of linear or branched (C_1-C_6)alkyl, halogen, NRR', CN, CF_3, OR, =O, C(O)R, C(O)OR, NHC(O)R, OC(O)R, linear or branched (C_2-C_6)alkenylene or C(O)NRR';
- each R and R', identical or different, are independently chosen from H, linear or branched (C_1-C_6)alkyl, cycloalkyl, aryl, aromatic or non aromatic heterocycle, linear or branched -(C_1-C_6)alkyl-aryl or linear or branched -(C_1-C_6)alkyl-heterocycle, wherein the heterocycle is aromatic or non aromatic; optionally substituted or not by OH, CO_2H, $C(O)NH_2$, NH_2

- R^{10} independently is chosen from a bond, a linear or branched (C_1-C_6)alkyl;
- R^{11} independently is chosen from an hydrogen atom, a linear or branched (C_1-C_6)alkyl or an aryl, the alkyl or aryl is optionally substituted by OH, NH_2, C(O)OH or C(O)NH;

where "aryl" refers to an aromatic monocyclic or multicyclic hydrocarbon ring system of 6 to 14 carbon atoms;

where "cycloalkyl" refers to a non-aromatic monocyclic or multicyclic hydrocarbon ring of 3 to 10 carbon atoms;

where "heteroaryl" refers to 5 to 14 aromatic hetero, mono-, bi- or multicyclic rings;

where "heterocycle" refers to a saturated, partially unsaturated or unsaturated non-aromatic stable 3 to 14 membered, mono-, bi- or multicyclic rings.

or their pharmaceutically acceptable salts or their optical isomers, racemates, diastereoisomers, enantiomers or tautomers,
with a pharmaceutical acceptable excipient.

16. A pharmaceutical composition according to claim 15 wherein L^2 is linear or branched (C_1-C_6)alkylene-O or a linear or branched (C_1-C_6)alkylene optionally interrupted by at least one heteroatom chosen from O, NR or S and/or optionally substituted by : R, OR, NRR', (C_1-C_6)alkyl-OR, (C_1-C_6)alkyl-NRR', OC(O)R, NHC(O)R, NHC(O)NRR', CN, C(=NH)NHOR

17.- A pharmaceutical composition according to claim 15 or 16 wherein R^1, R^8, R^3, R^4, R^5, R^6, L^1, L^2, X, q, n are defined as in anyone of claims 2 to 11.

18.- A pharmaceutical composition according to claim 15 to 17 wherein the compound of formula (I') is chosen in the group consisting of:
3-({4-hydroxy-1-[3-(2-methoxyphenyl)propanoyl]piperidin-4-yl}methyl)-3,4-dihydroquinazolin-4-one
7-chloro-3-{[1-(2-ethylbutanoyl)-4-hydroxypiperidin-4-yl]methyl}-3,4-dihydroquinazolin-4-one
3-({1-[2-(3-fluorophenoxy)acetyl]-4-hydroxypiperidin-4-yl}methyl)-3,4-dihydroquinazolin-4-one
3-{[4-hydroxy-1-(2-methylpropanoyl)piperidin-4-yl]methyl}-6,7-dimethoxy-3,4-dihydroquinazolin-4-one
3-{[4-hydroxy-1-(2-methylpropanoyl)piperidin-4-yl]methyl}-3,4-dihydroquinazolin-4-one
4-hydroxy-1-([2-methyl-3-(thiophen-2-yl)propanoyl]piperidin-4-yl}methyl)-3,4-dihydroquinazolin-4-one
7-chloro-3-{[1-(3-cyclopentylpropanoyl)-4-hydroxypiperidin-4-yl]methyl}-3,4-dihydroquinazolin-4-one
3-{[1-(3-cyclopentylpropanoyl)-4-hydroxypiperidin-4-yl]methyl}-3,4-dihydroquinazolin-4-one
7-chloro-3-{[4-hydroxy-1-(3-phenylpropanoyl)piperidin-4-yl]methyl}-3,4-dihydroquinazolin-4-one
3-{[4-hydroxy-1-(3-phenylpropanoyl)piperidin-4-yl]methyl}-3,4-dihydroquinazolin-4-one

7-chloro-3-({4-hydroxy-1-[2-methyl-3-(thiophen-2-yl)propanoyl]piperidin-4-yl}methyl)-3,4-dihydroquinazolin-4-one

3-({4-hydroxy-1-[3-(thiophen-2-yl)propanoyl]piperidin-4-yl}methyl)-3,4-dihydroquinazolin-4-one

3-{[1-(2-benzylpropanoyl)-4-hydroxypiperidin-4-yl]methyl}-3,4-dihydroquinazolin-4-one

3-{[1-(2-benzylpropanoyl)-4-hydroxypiperidin-4-yl]methyl}-7-chloro-3,4-dihydroquinazolin-4-one

or their pharmaceutically acceptable salts or their optical isomers, racemates, diastereoisomers, enantiomers or tautomers.

19. In vitro use of a compound of formula (I') as defined in anyone of claims 15 to 18 for inhibiting a deubiquitinating enzyme.

20. The use in vitro for use according to claim 19 for inhibiting USP7 (Ubiquitin Specific Protease 7)/HAUSP (Herpes Associated Ubiquitin Specific Protease).

21. A compound according to anyone of claims 15 to 18 for use for treating and/or preventing cancer and metastasis, neurodegenerative diseases, chosen from Alzheimer's disease and Parkinson's disease, immunological disorders, diabetes, bone and joint diseases, osteoporosis, arthritis inflammatory disorders, cardiovascular diseases, viral infections and diseases, and/or viral infectivity and/or latency, bacterial infections and diseases.

22. The compound for use according to claim 20, wherein said viral infections and diseases are chosen from herpes simplex-1 or -2 viral infections, hepatitis A, hepatitis C, SARS coronavirus infection and disease, Epstein-Barr virus, rhinoviral infections and diseases, adenoviral infections and diseases, poliomyelitis.

23. A combination comprising a compound of formula (I') as defined in anyone of claims 15 to 18, with one or more active agents chosen from anti-cancer agents, neurological agents, thrombolytic agents, antioxidant agents, anti-diabetes agents, anti-infective, anti-hypertensive agents, diuretic agents, thrombolytic agents, immunosuppressive agents, cardiovascular agents, immunomodulatory agents, anti-inflammatory agents, antiviral agents, anti-bacterial agents.