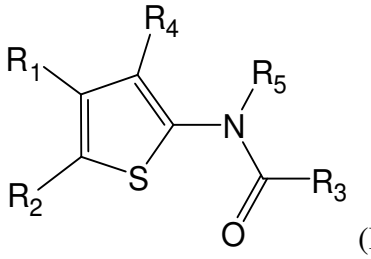
CLAIMS

1. A compound of formula (I):



(I),

wherein:

- R_1 represents:
  - a fused arylcycloalkyl optionally substituted by at least one radical selected in the group consisting of:
    - a halogen,
    - a (C_1-C_6)alkyl or a (C_1-C_6)alkyloxy optionally substituted by at least one halogen, preferably optionally substituted by at least one fluorine, and
    - a hydroxy,
    - a -CO-R_6 or a -CO_2R_6 with R_6 being a hydrogen or a (C_1-C_6)alkyl, and
    - an optionally substituted aryl;
- R_2 represents:
  - a hydrogen,
  - a halogen,
  - a (C_1-C_6)alkyl optionally substituted by at least one halogen, preferably optionally substituted by at least one fluorine, or
  - an optionally substituted cycloalkyl;
- R_3 represents:
  - a 5-10 membered ring, saturated or unsaturated selected in the group consisting of:
    - an aryl optionally fused to a heterocycloalkyl, preferably selected from the group consisting of a dioxole, a morpholine, a dioxane, a tetrahydropyran, and a tetrahydrofuran,
    - a heteroaryl, and

- a 5-10 membered bridged carbocyclyl or heterocyclyl,

said 5-10 membered ring is optionally substituted by at least one radical selected in the group consisting of:

- a halogen,

- a (C_1-C_6)alkyl optionally substituted by at least one halogen, preferably optionally substituted by at least one fluorine, or by an optionally bridged heterocycloalkyl optionally substituted by a (C_1-C_6)alkyl,

- a -NH-(C_1-C_6)alkyl or a -N-((C_1-C_6)alkyl)$_2$, optionally substituted by at least one radical selected in the group consisting of a heterocycloalkyl, a cycloalkyl, a hydroxyl, a thiacycloalkyl-1,1dioxide and a (C_1-C_6)alkyloxy,

- a -NH-heterocycloalkyl, a -NH-cycloalkyl, a -N((C_1-C_6)alkyl)-heterocycloalkyl, or a -NH((C_1-C_6)alkyl)-thiacycloalkyl-1,1dioxide, optionally substituted by a hydroxyl, a (C_1-C_6)alkyl, a (C_1-C_6)alkyloxy or a -CO-R_6 with R_6 being a hydrogen or a (C_1-C_6)alkyl,

- a hydroxy, a -CN, a -CO-R_6 or a -CO_2R_6 with R_6 being a hydrogen or a (C_1-C_6)alkyl,

- a (C_1-C_6)alkyloxy optionally substituted by at least one radical selected in the group consisting of a halogen, preferably a fluorine, a hydroxy, a (C_1-C_6)alkyloxy, a -NR_7R_8 with R_7 and R_8 are independently a hydrogen or a (C_1-C_6)alkyl, a –NHCOR_9, a -$NHCO_2R_9$, with R_9 being a (C_1-C_6)alkyl, a -CO_2R_6 with R_6 being a hydrogen or a (C_1-C_6)alkyl, and a heterocycle,

- a -NHCOR_9, a -$NHCO_2R_9$, or a -SO_2R_9, with R_9 being a (C_1-C_6)alkyl, and

- a heterocycloalkyl, a bridged heterocycloalkyl, a heterocycloalkyloxy, a cycloalkyloxy, a thiaheterocycloalkyl-1,1-dioxide or a spiroheterocycloalkyl, optionally substituted by a (C_1-C_6)alkyl, a (C_1-C_6)alkyloxy, a hydroxy, a ketone, a halogen or a (C_1-C_6)alkyl optionally substituted by a (C_1-C_6)alkyloxy;~~,~~ ~~or~~

- ~~a (C_1-C_6)alkyl or a (C_2-C_6)alkenyl, optionally substituted by a 5-10 membered ring as defined above or a $-CO_2R_6$ with R_6 being a hydrogen or a (C_1-C_6)alkyl;~~

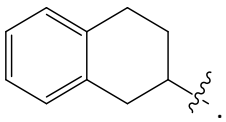
- R_4 represents:
  - a $-CO_2R_{10}$ with R_{10} being a hydrogen; and
- R_5 represents:
  - a hydrogen, or
  - a (C_1-C_6)alkyl optionally substituted by at least one halogen, preferably optionally substituted by at least one fluorine;

and the stereoisomers, and the pharmaceutical salts thereof.

2. The compound according to claim 1, wherein:

- R_1 represents:
  - an optionally substituted fused arylcycloalkyl selected in a group consisting of an indanyl, a 1,2,3,4-tetrahydronaphtalenyl, and a 6,7,8,9-tetrahydro-5H-benzo[7]annulenyl, preferably an indanyl and a 1,2,3,4-tetrahydronaphtalenyl, more preferably a 1,2,3,4-tetrahydronaphtalenyl.

3. The compound according to claim 1 or 2, wherein R_1 is



4. The compound according to any one of claims 1-3, wherein:

- R_3 represents an aryl optionally fused to a heterocycloalkyl, preferably selected from the group consisting of a dioxole, a morpholine, a dioxane, a tetrahydropyran, and a tetrahydrofuran, or a heteroaryl, said aryl, fused aryl, or heteroaryl is optionally substituted by at least one radical selected in the group consisting of:
  - a heterocycloalkyl or a bridged heterocycloalkyl, optionally substituted by a (C_1-C_6)alkyl, a (C_1-C_6)alkyloxy, or a ketone,

- a thiaheterocycloalkyl-1,1-dioxide, a heterocycloalkyloxy, or a cycloalkyloxy;
- a (C_1-C_6)alkyloxy or a (C_1-C_6)alkyl, optionally substituted by at least one halogen, preferably a fluorine, or a (C_1-C_6)alkyloxy,
- a halogen, preferably a fluorine or a chlorine,
- a -NH-(C_1-C_6)alkyl or a -N-((C_1-C_6)alkyl)$_2$, optionally substituted by a heterocycloalkyl, a cycloalkyl, a hydroxyl, a thiacycloalkyl-1,1-dioxide or a (C_1-C_6)alkyloxy,
- a -NH-heterocycloalkyl, a -N((C_1-C_6)alkyl)-heterocycloalkyl, or a -NH((C_1-C_6)alkyl)-thiacycloalkyl-1,1-dioxide,
- a hydroxy,
- a -CN,
- a (C_1-C_6)alkyl substituted by an optionally bridged heterocycloalkyl or an optionally substituted heterocycloalkyl; and
- a -SO_2R_9, with R_9 being a (C_1-C_6)alkyl.

5. The compound according to any one of claims 1-4, wherein:

- R_3 represents:
  - a phenyl, a pyridinyl or a pyrimidinyl, preferably a phenyl, optionally substituted by at least one radical selected in the group consisting of:
    - a morpholinyl optionally substituted by at least one methyl,
    - a -NH-tetrahydropyranyl,
    - a -NH-(C_1-C_6)alkyl or a -N(CH_3)(C_1-C_6)alkyl), optionally substituted by a tetrahydropyranyl, a cyclohexyl, an optionally bridged morpholinyl optionally substituted by at least one methyl, a thiacycloalkyl-1,1-dioxide, a hydroxy, or a (C_1-C_6)alkyloxy,
    - an azetidinyl optionally substituted by a (C_1-C_6)alkyloxy,
    - a pyrrolidin-2-one,
    - a 6-oxa-3-azabicyclo[3.1.1]heptane, or a 8 oxa-3-azabicyclo[3.2.1]octane,
    - a (C_1-C_6)alkyloxy, optionally substituted by at least one halogen, preferably a fluorine, or one (C_1-C_6)alkyloxy,

- a halogen, preferably a fluorine and a chlorine,
- a hydroxy,
- a -CN,
- a $-SO_2-CH_3$,
- a 1,1-dioxo-1,2-thiazolidin,
- a cyclobutyloxy, or a tetrahydropyranyloxy,
- a (C_1-C_6)alkyl optionally substituted by at least one halogen, preferably optionally substituted by at least one fluorine, and
- a (C_1-C_6)alkyl substituted by a morpholinyl optionally substituted by at least one methyl, a 6-oxa-3-azabicyclo[3.1.1]heptane, a 8 oxa-3-azabicyclo[3.2.1]octane or a tetrahydropyranyl.

6. The compound according to any one of claims 1-5, wherein:

- R_2 represents:
  - a hydrogen,
  - a halogen, preferably a chlorine, and
  - an optionally substituted (C_3-C_6)cycloalkyl, preferably cyclopropyl.

7. The compound according to any one of claims 1-6, wherein R_2 represents a hydrogen.

8. The compound of formula (I) according to claim 1, wherein said compound is selected in the group consisting of compounds of the table A.

9. A compound according to any one of claims 1-8, for use as a medicine.

10. A pharmaceutical composition comprising a compound as defined in any one of claims 1-8, and an acceptable pharmaceutical excipient.

11. Use of a compound according to any one of claims 1-8, in the manufacture of a medicament for treating a disease selected from the group consisting of an infection, preferably a viral or a

bacterial infection, a cancer, a metabolic disease, a cardiovascular disease, an inflammatory disorder, iron storage disease/disorder, aging and a neurodegenerative disease or disorder.

12. The use according to claim 11, wherein the disease is a viral infection.

13. The use according to claim 12, wherein the viral infection is an infection by a virus selected from the group consisting of *Alphaviridae*, *Flaviviridae*, *Hepadnaviridae*, *Herpesviridae*, *Orthomyxoviridae*, *Papovaviridae*, *Paramyxoviridae*, *Picornaviridae*, *Polyomaviridae*, *Reoviridae*, *Retroviridae*, *Rhabdoviridae*, and *Tobamoviruses.*

14. The use according to claim 11, wherein

- the bacterial infection is an infection by a bacterium selected from the group consisting of *Helicobacter pylori*, *Burkholderia cepacia*, *Pseudomonas aeruginosa*, *Pseudomonas fluorescens*, *Pseudomonas acidovorans*, *Pseudomonas alcaligenes*, *Pseudomonas putida*, *Stenotrophomonas maltophilia*, *Aeromonas hydrophilia*, *Escherichia coli*, *Citrobacter freundii*, *Salmonella typhimurium*, *Salmonella typhi*, *Salmonella paratyphi*, *Salmonella enteritidis*, *Shigella dysenteriae*, *Shigella flexneri*, *Shigella sonnei*, *Enterobacter cloacae*, *Enterobacter aerogenes*, *Klebsiella pneumoniae*, *Klebsiella oxytoca*, *Serratia marcescens*, *Francisella tularensis*, *Morganella morganii*, *Proteus mirabilis*, *Proteus vulgaris*, *Providencia alcalifaciens*, *Providencia rettgeri*, *Providencia stuartii*, *Acinetobacter baumannii*, *Acinetobacter calcoaceticus*, *Acinetobacter haemolyticus*, *Yersinia enterocolitica*, *Yersinia pestis*, *Yersinia pseudotuberculosis*, *Yersinia intermedia*, *Bordetella parapertussis*, *Bordetella bronchiseptica*, *Haemophilus parainfluenzae*, *Haemophilus haemolyticus*, *Haemophilus parahaemolyticus*, *Haemophilus ducreyi*, *Pasteurella multocida*, *Pasteurella haemolytica*, *Branhamella catarrhalis*, *Campylobacter fetus*, *Campylobacter jejuni*, *Campylobacter coli*, *Borrelia burgdorferi*, *Vibrio cholerae*, *Vibrio parahaemolyticus*, *Listeria monocytogenes*, *Neisseria gonorrhoeae*, *Neisseria meningitidis*, *Kingella denitrificans*, *Kingella indologenes*, *Kingella kingae*, *Kingella oralis*, *Legionella pneumophila*, *Moraxella bovis*, *Moraxella catarrhalis*, *Moraxella lacunata*, *Gardnerella vaginalis*, *Bacteroides fragilis*, *Bacteroides distasonis*, *Bacteroides vulgatus*, *Bacteroides ovalus*, *Bacteroides thetaiotaomicron*, *Bacteroides uniformis*, *Bacteroides eggerthii*, *Bacteroides splanchnicus*, *Clostridium difficile*, *Clostridium tetani, Mycobacterium* species,

Corynebacterium ulcerans, *Streptococcus agalactiae*, *Gardnerella vaginitis*, *Streptococcus pyogenes*, *Enterococcus faecalis*, *Enterococcus faecium*, *Fusobacterium nucleatum*, *Porphyromonas gingivalis*, *Vibrio vulnificus*, *Clostridium botulinum*, *Corynebacterium diptheriae*, *Staphylococcus aureus*, *Staphylococcus epidermidis*, *Staphylococcus saprophyticus*, *Staphylococcus intermedius*, *Staphylococcus hyicus*, *Staphylococcus haemolyticus*, *Staphylococcus hominis*, and *Staphylococcus saccharolyticus*;

- the cancer is selected from the group consisting of a breast cancer, a lung cancer, in particular NSCLC, a melanoma, a colorectal cancer, an astrocytoma cancer, a liver cancer, leukemia, in particular acute myeloid leukemia, a gastric cancer, a head and neck cancer, a cervical cancer, a pancreatic cancer, and an ovarian cancer;
- the metabolic disease is selected from the group consisting of Diabetes mellitus, insulin resistance, insulin deficiency, hepatic steatosis, nonalcoholic fatty liver disease, Nonalcoholic steatohepatitis (NASH), glucose intolerance, obesity, lipodystrophy, coronary heart disease, diabetic retinopathy, diabetic neuropathy, diabetic nephropathy, hypoglycemia, hyperglycemia, beta cell dysfunction or hyperinsulinaemia, Wolfram syndrome, in particular Wolfram syndrome from CISD1-3, Polycystic ovary syndrome, pyruvate dehydrogenase deficiency, Albright hereditary osteodystrophy, cystinosis, fructose intolerance, Walker-Warburg syndrome, hypobetalipoproteinemia, Alström syndrome, and cirrhosis;
- the cardiovascular disease is selected in the group consisting of myocardial injury, Ischemia, Ischemia reperfusion injury and hypertension; or
- the inflammatory disease or disorder is selected from the group consisting of Crohn disease, inflammatory bowel disease, asthma, chronic obtrusive pulmonary disease (COPD), systemic lupus erythematosus, cystic fibrosis, psoriasis, infectious arthritis, and multiple sclerosis; or
- the iron storage disorder or disease is selected from the group consisting of Ferroportin Deficiency, Hereditary Hemochromatosis, including Hereditary Hemochromatosis due to HFE mutations and Hereditary Hemochromatosis due to transferrin receptor 2 mutations, Juvenile Hemochromatosis, including Juvenile Hemochromatosis due to hepcidin mutations and Juvenile Hemochromatosis due to hemojuvelin mutations, Iron Overload, including African Iron Overload, Iron Overload secondary to atransferrinemia and Iron Overload secondary to aceruloplasminemia, Thalassemia, Myelodysplastic Syndromes, Congenital Dyserythropoietic

Anemias, Sickle Cell Disease and other Hemoglobinopathies, Red Cell Enzyme Deficiencies and Multiple Blood Transfusions.

15. The use according to claim 11, wherein the metabolic disease or disorder is selected from the group consisting of diabetes, in particular diabetes type I or diabetes type II, atherosclerosis, obesity, diabetic neuropathies, lysosomal storage diseases, severe insulin resistance, hyperinsulinemia, hyperlipidemia, Rabson-Mendenhall syndrome, leprechaunism, lipoatrophic diabetes, acute and chronic renal insufficiency, end-stage chronic renal failure, glomerulonephritis, interstitial nephritis, pyelonephritis, glomerulosclerosis, and lipoatrophic diabetes, hepatic steatosis, nonalcoholic fatty liver disease, Nonalcoholic steatohepatitis (NASH), glucose intolerance, lipodystrophy, coronary heart disease, diabetic retinopathy, diabetic neuropathy, diabetic nephropathy, hypoglycemia, hyperglycemia, beta cell dysfunction or hyperinsulinaemia, Wolfram syndrome, Polycystic ovary syndrome, pyruvate dehydrogenase deficiency, Albright hereditary osteodystrophy, cystinosis, fructose intolerance, Walker-Warburg syndrome, hypobetalipoproteinemia, Alström syndrome, and cirrhosis.