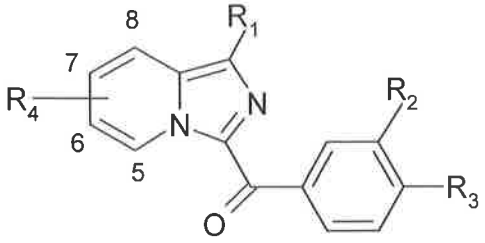
CLAIMS

1. A compound of formula (I):



(I)

in which:

- R_1 represents

  . a hydrogen or halogen atom,

  . an alkyl group optionally substituted with $-COOR_5$,

  . an alkenyl group optionally substituted with $-COOR_5$,

  . a $-COOR_5$ or $-CONR_5R_6$ group,

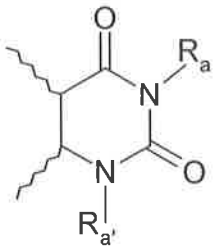
  . an $-NR_5COR_6$ or $-NR_5-SO_2R_6$ group,

  or

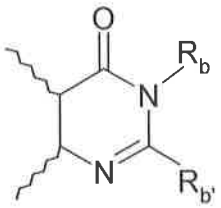
  . an aryl group or a heteroaryl group, said aryl or heteroaryl group being optionally substituted with one or more groups selected from: halogen atoms, alkyl groups, cycloalkyl groups, $-COOR_5$, $-CF_3$, $-OCF_3$, -CN, $-C(NH_2)NOH$, $-OR_5$, -O-Alk-$COOR_5$, -O-Alk-NR_5R_6, -O-Alk-NR_7R_8, -Alk-OR_5, -Alk-$COOR_5$, $-CONR_5R_6$, -CO-NR_5-OR_6, -CO-NR_5-SO_2R_7, $-CONR_5$-Alk-NR_5R_6, $-CONR_5$-Alk-NR_7R_8, -Alk-NR_5R_6, $-NR_5R_6$, $-NC(O)N(CH_3)_2$, -CO-Alk, $-CO(OAlk)_nOH$, COO-Alk-NR_5R_6, COO-Alk-NR_7R_8 and 5-membered heteroaryl groups, said heteroaryl groups being optionally substituted with one or more groups selected from halogen atoms and alkyl, $-CF_3$, -CN, $-COOR_5$, -Alk-OR_5, -Alk-$COOR_5$, $-CONR_5R_6$, $-CONR_7R_8$, -CO-NR_5-OR_6, -CO-NR_5-SO_2R_6, $-NR_5R_6$ and -Alk-NR_5R_6 groups, or with a hydroxyl group or with an oxygen atom,

  - n is an integer ranging from 1 to 3,

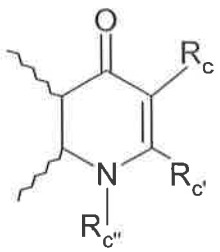
  - R_2 and R_3 together form, with the carbon atoms of the phenyl nucleus to which they are attached, a 6-membered nitrogenous heterocycle corresponding to one of formula (A), (B) or (C) below:



(A)



(B)



(C)

in which the wavy lines represent the phenyl nucleus to which R_2 and R_3 are attached and:

. R_a represents a hydrogen atom or an alkyl, haloalkyl, -Alk-CF_3, -Alk-$COOR_5$, -Alk'-$COOR_5$, -Alk-$CONR_5R_6$, -Alk'-$CONR_5R_6$, -Alk-$CONR_7R_8$, -Alk-NR_5R_6, -Alk$CONR_5$-OR_6, -Alk-NR_7R_8, -Alk-cycloalkyl, -Alk-O-R_5, -Alk-S-R_5, -Alk-CN, -OR_5, -OAlk$COOR_5$, -NR_5R_6, -NR_5-$COOR_6$, -Alk-aryl, -Alk-O-aryl, -Alk-O-heteroaryl, -Alk-heteroaryl or heteroaryl group, where the aryl or heteroaryl group is optionally substituted with one or more halogen atoms and/or alkyl, cycloalkyl, -CF_3, -OCF_3, -O-R_5 or -S-R_5 groups,

. $R_{a'}$ represents a hydrogen atom or a linear, branched, cyclic or partially cyclic alkyl group, or an -Alk-OR_5, -Alk-NR_5R_6 or -Alk-NR_7R_8 group, $R_{a'}$ being optionally substituted with one or more halogen atoms,

. R_b represents a hydrogen atom or an alkyl or -Alk-$COOR_5$ group,

. $R_{b'}$ represents a hydrogen atom or an alkyl, haloalkyl, cycloalkyl, phenyl or -Alk-$COOR_5$ group,

. R_c represents a hydrogen atom or an alkyl, -CN, -$COOR_5$, -CO-NR_5R_6, -$CONR_7R_8$ -CO-NR_5-Alk-NR_5R_6, -$CONR_5$-Alk-OR_5, -$CONR_5SO_2R_5$, -Alk-aryl or -Alk-heteroaryl group, where the aryl or heteroaryl group is optionally substituted with one or more halogen atoms and/or alkyl, cycloalkyl, -CF_3, -OCF_3, -O-alkyl or -S-alkyl groups,

. $R_{c'}$ represents a hydrogen atom or an alkyl group,

. $R_{c''}$ represents a hydrogen atom or an alkyl, alkenyl, haloalkyl, cycloalkyl, -Alk-NR_5R_6, -Alk-NR_7R_8, -Alk-OR_5 or -Alk-SR_5 group,

- R_4, located on position 6, 7 or 8 of the imidazopyridine nucleus, represents:

. a hydrogen atom,

. a -$COOR_5$ group,

. a -CO-NR_5-Alk-NR_5R_6 group,

. a -CO-NR_5-Alk-NR_7R_8 group, or

. a -CO-NR_5-Alk-OR_6 group,

- R_5 and R_6, which may be identical or different, represent hydrogen atoms, haloalkyl groups or alkyl groups, cycloalkyl groups or an Ms group,

- R_7 and R_8, which may be identical or different, represent hydrogen atoms or alkyl or phenyl groups, or else R_7 and R_8 together form a 3- to 8-membered saturated ring which can optionally contain a heteroatom,

- Alk represents a linear or branched alkylene chain, and

- Alk' represents a linear, branched, cyclic or partially cyclic alkylene chain,

optionally in the form of a pharmaceutically acceptable salt thereof.

2. The compound according to Claim 1, in which R_1 represents:

. a hydrogen or halogen atom,

. an alkyl group which is unsubstituted or substituted with -$COOR_5$,

. an alkenyl group which is unsubstituted or substituted with -$COOR_5$,

. a -$COOR_5$ group,

. a -$CONR_5R_6$ group,

. an -NR_5-SO_2R_6 group, or

. a phenyl group optionally substituted with one or two groups selected from:

- halogen atoms;
- alkyl groups optionally substituted with -$COOR_5$;
- –CN, -$C(NH_2)NOH$, -$COOR_5$, -$CONR_5R_6$, -CO-NR_5-OR_6, -CO-NR_5-SO_2R_6, -COAlk, –$CO(OAlk)_nOH$, -OR_5, -OCF_3 , -O-Alk-$COOR_5$, -Alk-OR_5, -NR_5R_6 or -$NC(O)N(CH_3)_2$ groups,
- 5-membered heteroaryls optionally substituted with an alkyl group and/or a hydroxyl group or an oxygen atom,

in which R_5 and R_6, which may be identical or different, represent hydrogen atoms, or alkyl groups optionally substituted with an –NR_7R_8 group,

R_7 represents a hydrogen atom, an alkyl group containing 1 or 2 carbon atoms or a phenyl group, n is an integer ranging from 1 to 3, or

. a heteroaryl group which is optionally condensed and/or optionally substituted with one or two groups selected from alkyl groups, OR_5, $-COOR_5$, $-NR_5R_6$ and cycloalkyl groups, and an oxygen atom, in which R_5 and R_6, which may be identical or different, represent hydrogen atoms or alkyl groups containing 1 or 2 carbon atoms,

optionally in the form of a pharmaceutically acceptable salt thereof.

3. The compound according to Claim 1, in which R_2 and R_3 together form, with the carbon atoms of the phenyl nucleus to which they are attached, a 6-membered nitrogenous heterocycle corresponding to either of formulae (A) and (B) as defined in Claim 1, optionally in the form of a pharmaceutically acceptable salt thereof.

4. The compound according to Claim 1, in which R_2 and R_3 together form, with the carbon atoms of the phenyl nucleus to which they are attached, a 6-membered nitrogenous heterocycle corresponding to formula (A) as defined in Claim 1, optionally in the form of a pharmaceutically acceptable salt thereof.

5. The compound according to Claim 1, in which formula (A) or (B) is such that:

. R_a represents a hydrogen atom or an alkyl group, optionally substituted with one or more halogens; $-AlkCONR_5R_6$; haloalkyl; $-CH_2-COOR_5$; -Alk-heteroaryl, -Alk-O-phenyl or -Alk-phenyl, where the phenyl group is optionally substituted with one or two alkyl groups and/or OR_5 and/or halogen atoms; -Alk-cycloalkyl,

. $R_{a'}$ represents a hydrogen atom or a linear, branched, cyclic or partially cyclic alkyl group, or a $-CH_2-OR_5$ or $-Alk-NR_5R_6$ group,

. R_b represents a hydrogen atom or an alkyl group,

. $R_{b'}$ represents a hydrogen atom or an alkyl, phenyl or $-CH_2-COOR_5$ group,

in which the alkyl groups contain 1 to 6 carbon atoms, R_5 being as described in Claim 1,

optionally in the form of a pharmaceutically acceptable salt thereof.

6. The compound according to Claim 1, in which R_4 represents a hydrogen atom or a -COOH, $-CO-NH-Alk-NR_7R_8$ or -CO-NH-Alk-OH group, or else an alkyl group which is unsubstituted,

in which Alk, R_7 and R_8 are as described in Claim 1.

7. The compound according to Claim 1 selected from the following compounds:
6-(imidazo[1,5-a]pyridin-3-ylcarbonyl)-3-propylquinazoline-2,4(1*H*,3*H*)-dione,
3-{3-[(2,4-dioxo-3-propyl-1,2,3,4-tetrahydroquinazolin-6-yl)carbonyl]imidazo[1,5-a]pyridin-1-yl}benzoic acid,
3-[(2,4-dioxo-3-propyl-1,2,3,4-tetrahydroquinazolin-6-yl)carbonyl]imidazo[1,5-a]pyridine-6-carboxylic acid,
3-(3-{[3-(4-fluorobenzyl)-1-methyl-2,4-dioxo-1,2,3,4-tetrahydroquinazolin-6-yl]carbonyl}imidazo[1,5-a]pyridin-1-yl)benzoic acid,
3-{3[(2,4-dioxo-3-propyl-1,2,3,4-tetrahydroquinazolin-6-yl)carbonyl]imidazo[1,5-a]pyridin-1-yl}benzamide,
6-({1-[3-(5-methyl-1,3,4-oxadiazol-2-yl)phenyl]imidazo[1,5-a]pyridin-3-yl}carbonyl-3-propylquinazoline-2,4(1*H*, 3*H*)-dione,
6-({1-[3-(3-methyl-1,2,4-oxadiazol-5-yl)phenyl]imidazo[1,5-a]pyridin-3-yl}carbonyl)-3-propylquinazoline-2,4(1H, 3H)-dione,
N-{3-[(2,4-dioxo-3-propyl-1,2,3,4-tetrahydroquinazolin-6-yl)carbonyl]imidazo[1,5-a]pyridin-1-yl}methanesulphonamide,
2-morpholin-4-yl-ethyl 3-(3-{[3-(4-fluorobenzyl)-1-methyl-2,4-dioxo-1,2,3,4-tetrahydroquinazolin-6-yl]carbonyl}imidazo[1,5-a]pyridin-1-yl)benzoate,
N-[2-(dimethylamino)ethyl]-3-(3-{[3-(4-fluorobenzyl)-1-methyl-2,4-dioxo-1,2,3,4-tetrahydroquinazolin-6-yl]carbonyl}imidazo[1,5-a]pyridin-1-yl)benzamide,
3-(3-{[3-(4-fluorobenzyl)-1-propyl-2,4-dioxo-1,2,3,4-tetrahydroquinazolin-6-yl]carbonyl}imidazo[1,5-a]pyridin-1-yl)benzoic acid,
3-(4-fluorobenzyl)-1-methyl-6-[(1-pyridin-3-ylimidazo[1,5-a]pyridin-3-yl)carbonyl]quinazoline-2,4(1*H*, 3*H*)-dione,
3-{3-[(2-methyl-4-oxo-3-propyl-3,4-dihydroquinazolin-6-yl)carbonyl]imidazo[1,5-a]pyridin-1-yl}benzoic acid,
3-{3-[(2-methyl-4-oxo-3-propyl-3,4-dihydroquinazolin-6-yl)carbonyl]imidazo[1,5-a]pyridin-1-yl}benzamide,
6-(imidazo[1,5-*a*]pyridin-3-ylcarbonyl)quinazolin-4(3*H*)-one,

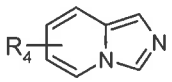
N,*N*,1,2-tetramethyl-4-oxo-6-{[1-(pyridin-3-yl)imidazo[1,5-*a*]pyridin-3-yl]carbonyl}-1,4-dihydroquinoline-3-carboxamide,

3-[3-({3-[2-(4-fluorophenoxy)ethyl]-1-propyl-2,4-dioxo-1,2,3,4-tetrahydroquinazolin-6-yl}carbonyl)imidazo[1,5-*a*]pyridin-1-yl]benzoic acid,

optionally in the form of a pharmaceutically acceptable salt thereof.

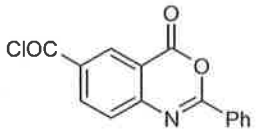
8. A process for preparing the compound according to Claim 1 in which R_2 and R_3 together form a nitrogenous heterocycle of formula (A) as defined in Claim 1, in which R_1 and $R_{a'}$ represent hydrogen atoms, comprising:

- condensing the compound of formula (IV)



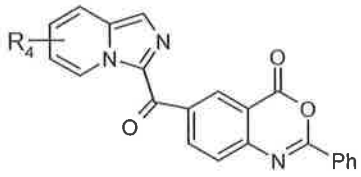
(IV)

in which R_4 is as defined in Claim 1, with the compound of formula (V)



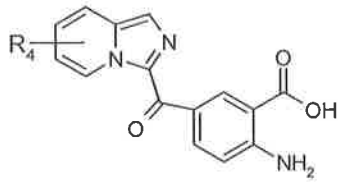
(V)

in order to obtain the compound of formula (VI)



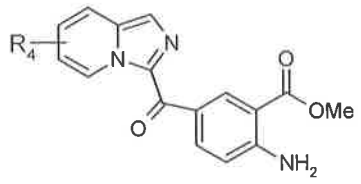
(VI)

- subjecting the compound of formula (VI) to a basic hydrolysis reaction in order to obtain the compound of formula (VII):



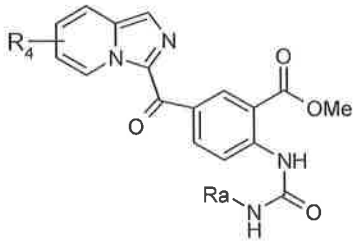
(VII) ,

- subjecting the compounded formula (VII) to a reaction of esterification to obtain the compound of formula (VIII)



(VIII)

- subjecting the compound of formula (VIII) to the action of triphosgene so as to form the isocyanate corresponding to the compound (VIII), and then condensing said isocyanate with an amine of formula R_aNH_2, R_a being as defined in Claim 1, in order to obtain the urea of formula (IX),

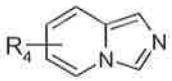


(IX)

-subjecting the urea of formula (IX) to a cyclization reaction in a basic medium.

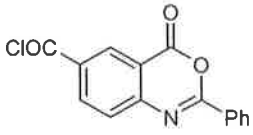
9. A process for preparing a derivative of formula (I) according to Claim 1 in which R_2 and R_3 together form a nitrogenous heterocycle of formula (A) as defined in Claim 1, R_1 is as defined in Claim 1, with the proviso that R_1 does not represent a hydrogen atom, and R_4 is as defined in Claim 1, comprising:

- condensing the compound of formula (IV)



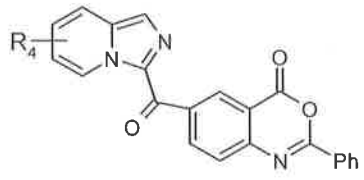
(IV)

in which R_4 is as defined in Claim 1, with the compound of formula (V)



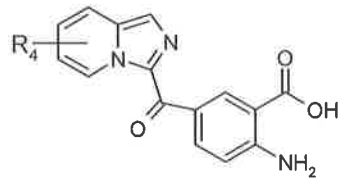
(V)

in order to obtain the compound of formula (VI)



(VI)

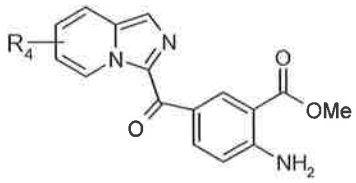
- subjecting the compound of formula (VI) to a basic hydrolysis reaction in order to obtain the compound of formula (VII):



(VII)

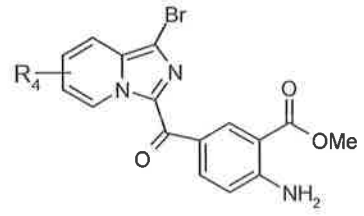
,

-subjecting the compound of formula (VII) to a reaction of esterification so as to obtain the compound of formula (VIII)



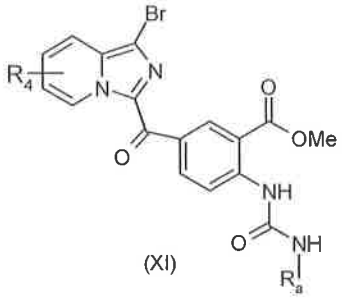
(VIII)

- subjecting the compound of formula (VIII) to a bromination reaction in order to obtain the compound of formula (X):



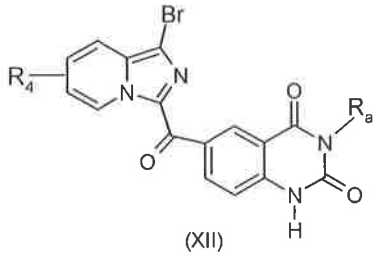
(X)

- subjecting the derivative of formula (X) to the action of triphosgene and forming the isocyanate corresponding to the compound of formula (X), which is condensed with an amine of formula R_aNH_2, R_a being as defined in Claim 1, in order to obtain the urea of formula (XI):



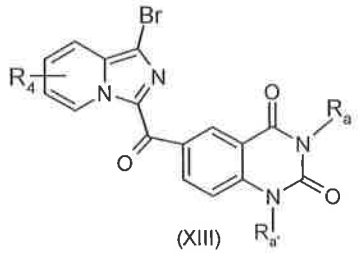
(XI)

- subjecting the compound of formula XI to a cyclization reaction in a basic medium in order to obtain the compound of formula (XII),



(XII)

- subjecting the compound of formula (XII) to an alkylation reaction in the presence of a base and of a halogenated derivative R_a'X, R_a' being as defined in Claim 1, in order to obtain the compound of formula (XIII):



(XIII)

- subjecting the compound of formula (XIII), in the presence of a palladium catalyst, of a ligand and of a base:

. to a reaction with phenylboronic or heteroarylboronic or phenylboronate ester or heteroarylboronate ester derivatives according to a Suzuki coupling,

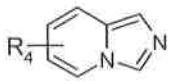
. or else to an imination reaction with benzophenoneimine, followed by an acid hydrolysis and by an alkylation reaction with a sulphonyl chloride of formula R_6SO_2Cl,

. or else to a cyanation reaction with zinc cyanide, followed by an acid hydrolysis and by an esterification or a peptide coupling with an amine $R_5R_6NH_2$, R_5 and R_6 being defined in Claim 1.

10. A process for preparing the compounds of formula (I) according to Claim 1 in which R_2 and

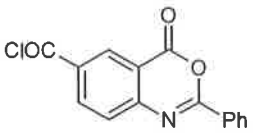
R_3 together form a nitrogenous heterocycle of formula (A) as defined in Claim 1, and in which R_1 and R_4 represent groups as defined in Claim 1, with the proviso that R_1 is not a hydrogen atom, comprising:

- condensing the compound of formula (IV)



(IV)

in which R_4 is as defined in Claim 1, with the compound of formula (V)



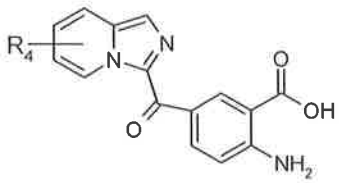
(V)

in order to obtain the compound of formula (VI)



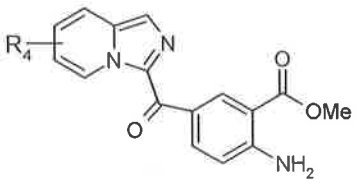
(VI)

- subjecting the compound of formula (VI) to a basic hydrolysis reaction in order to obtain the compound of formula (VII):



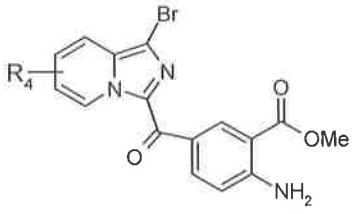
(VII) ,

- subjecting the compound of formula (VII) to a reaction of esterification so as to obtain the compound of formula (VIII):



(VIII)

-subjecting the compound of formula (VIII) to a bromination reaction in order to obtain the compound of formula (X):



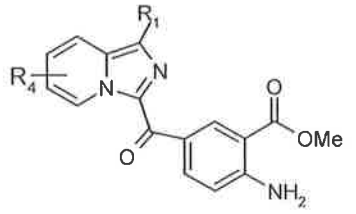
(X)

- subjecting the compound of formula (X), in the presence of a palladium catalyst, of a ligand and of a base:

. to a reaction with phenylboronic or heteroarylboronic or phenylboronate ester or heteroarylboronate ester derivatives according to a Suzuki coupling,

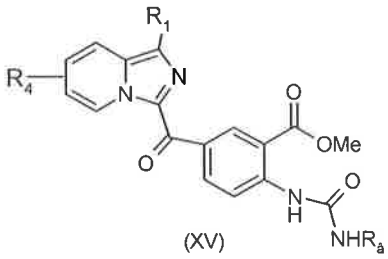
. or else to an imination reaction with benzophenoneimine, followed by an acid hydrolysis and by an alkylation reaction with a sulphonyl chloride of formula R_6SO_2Cl,

. or else to a cyanation reaction with zinc chloride, followed by an acid hydrolysis and by an esterification or a peptide coupling with an amine $R_5R_6NH_2$, R_5 and R_6 being defined in Claim 1, in order to obtain the compound of formula (XIV):



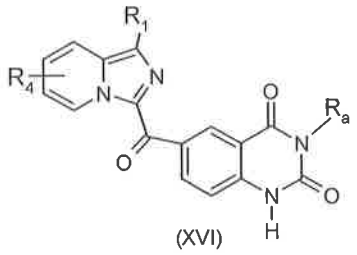
(XIV)

-subjecting the derivative of formula (XIV to the action of triphosgene so as to form the corresponding isocyanate, condensing the isocyanate obtained with an amine of formula R_aNH_2 in order to obtain the urea of formula (XV), R_a being as defined in Claim 1:



(XV)

-subjecting the derivative of formula (XV) to a cyclization reaction in a basic medium in order to obtain the compound of formula (XVI):

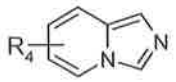


(XVI)

- subjecting the compound of formula (XVI) to an alkylation reaction in the presence of a base and of a halogenated derivative R_a-X, R_a being as defined in Claim 1 and X being a halogen.

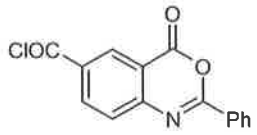
11. A process for preparing the compounds of formula (I) according to Claim 1 in which R_2 and R_3 together form a nitrogenous heterocycle of formula (A) and in which R_1 represents a group as defined in Claim 1, with the proviso that R_1 does not represent a hydrogen atom, R_4 being as defined in claim 1, comprising:

- condensing the compound of formula (IV)



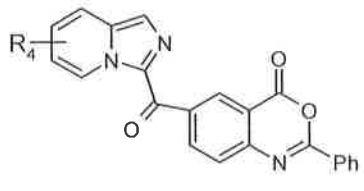
(IV)

in which R_4 is as defined in Claim 1, with the compound of formula (V)



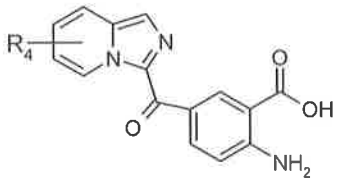
(V)

in order to obtain the compound of formula (VI)



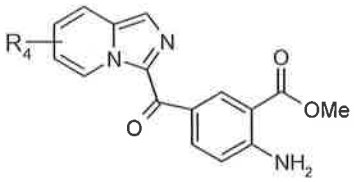
(VI)

- subjecting the compound of formula (VI) to a basic hydrolysis reaction in order to obtain the compound of formula (VII):



(VII) ,

- subjecting the compound of formula (VII) to a reaction of esterification so as to obtain the compound of formula (VIII)



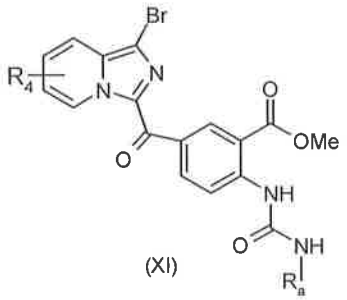
(VIII)

- subjecting the compound of formula (VIII to a bromination reaction in order to obtain the compound of formula (X):



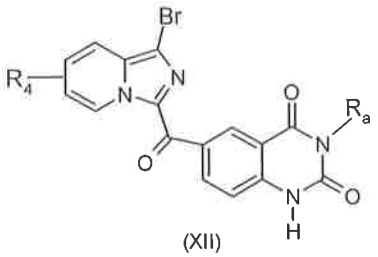
(X)

-subjecting the derivative of formula (X) to the action of triphosgene so as to form the corresponding isocyanate condensing said isocyanate with an amine of formula R_aNH_2, R_a being as defined in Claim 1, in order to obtain the urea of formula (XI):



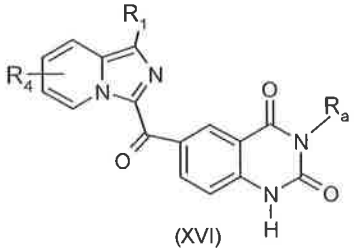
(XI)

- subjecting the compound of formula (XI to a cyclization reaction in a basic medium in order to obtain the compound of formula (XII)



(XII)

- subjecting the compound of formula (XII), in the presence of a palladium catalyst, of a ligand and of a base,
- to a reaction with phenylboronic or heteroarylboronic or phenylboronate ester or heteroarylboronate ester derivatives according to a Suzuki coupling,
- or else to an imination reaction with benzophenoneimine, followed by an acid hydrolysis and by a sulphonylation reaction with a sulphonyl chloride of formula R_6SO_2Cl,
- or else to a cyanation reaction with zinc cyanide, followed by an acid hydrolysis and by an esterification or a peptide coupling with an amine $R_5R_6NH_2$, R_5 and R_6 being as defined in Claim 1, in order to obtain the compound of formula (XVI) in which R_1 is as defined in Claim 1, with the proviso that R_1 does not represent a hydrogen atom,

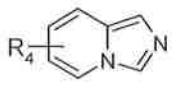


(XVI)

-subjecting the compound of formula (XVI) to an alkylation reaction in the presence of a base and of a halogenated derivative R_a'X, R_a' being as defined in Claim 1 and X being a halogen.

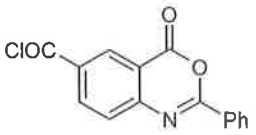
12. A process for preparing the compound according to Claim 1, in which R_2 and R_3 together form a nitrogenous heterocycle of formula (B) as defined in Claim 1, R_4 being as defined in Claim 1, and R_1 represents a hydrogen atom, comprising:

- condensing the compound of formula (IV)



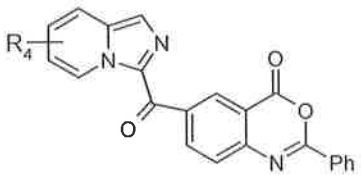
(IV)

in which R_4 is as defined in Claim 1, with the compound of formula (V)



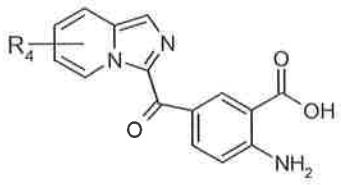
(V)

in order to obtain the compound of formula (VI)



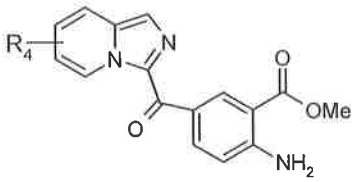
(VI)

-subjecting the compound of formula (VI) to a basic hydrolysis reaction in order to obtain the compound of formula (VII):



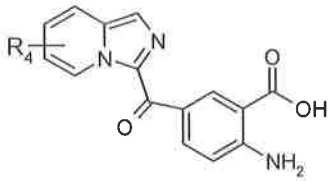
(VII)

- subjecting the compound of formula (VII) to a reaction of esterification so as to obtain the compound of formula (VIII)



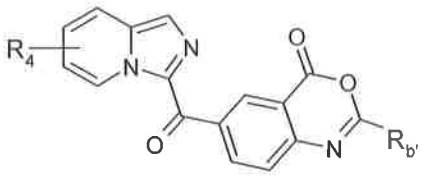
(VIII)

- subjecting the compound (VIII) to a saponification reaction in order to obtain the compound (XXIV):



(XXIV)

-subjecting the compound (XXIV) to a condensation reaction with an alkyl or aryl anhydride $(R_b{}'CO)_2O$ in order to obtain the compound of formula (XVII),

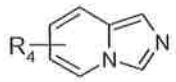


(XVII)

- subjecting the compound of formula (XVII) to a condensation reaction with an amine R_bNH_2, R_b and $R_{b'}$ being as defined in Claim 1.

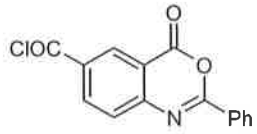
13. A process for preparing the compound according to Claim 1 in which R_2 and R_3 together form a nitrogenous heterocycle of formula (B) as defined in Claim 1, R_4 being as defined in Claim 1 and R_1 being as defined in Claim 1, with the proviso that R_1 does not represent a hydrogen atom, comprising:

-condensing the compound of formula (IV)



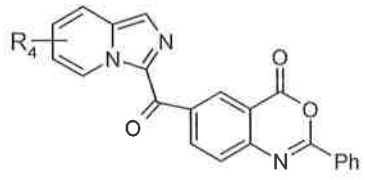
(IV)

in which R_4 is as defined in Claim 1, with the compound of formula (V):



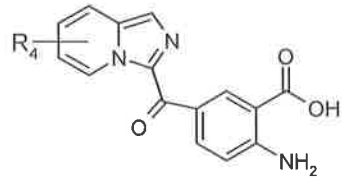
(V)

in order to obtain the compound of formula (VI):



(VI)

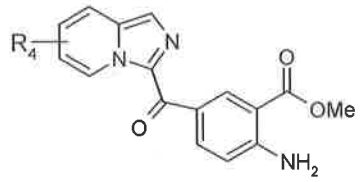
- subjecting the compound of formula (VI) to a basic hydrolysis reaction in order to obtain the compound of formula (VII):



(VII)

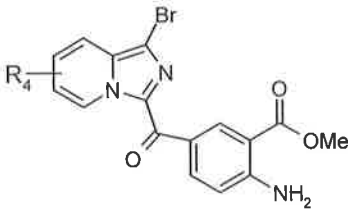
-subjecting the compound of formula (VII) to a reaction of esterification so as to

obtain the compound of formula (VIII):



(VIII)

-subjecting the compound of formula (VIII) to a bromination reaction in order to obtain the compound of formula (X):



(X)

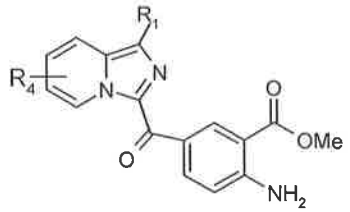
-subjecting the compound of formula (X), in the presence of a palladium catalyst, of a ligand and of a base,

- to a reaction with phenylboronic or heteroarylboronic or phenylboronate ester or heteroarylboronate ester derivatives according to a Suzuki coupling,

- or else to an imination reaction with benzophenoneimine, followed by an acid hydrolysis and by an alkylation reaction with a sulphonyl chloride of formula R_6SO_2Cl,

- or else to a cyanation reaction with zinc chloride, followed by an acid hydrolysis and by an esterification or a peptide coupling with an amine $R_5R_6NH_2$, R_5 and R_6 being defined in Claim 1,

- in order to obtain the compound of formula XIV:



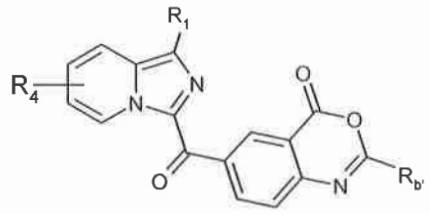
(XIV)

- subjecting the compound (XIV) to a saponification reaction in order to obtain the compound (XXV):



(XXV)

- subjecting the compound (XXV) to a condensation reaction with an alkyl or aryl anhydride $(R_{b'}CO)_2O$, $R_{b'}$ being as defined in Claim 1, in order to obtain the compound of formula (XVIII):



(XVIII)

- subjecting the compound of formula (XVIII) a condensation reaction with an amine R_bNH_2, R_b being as defined in Claim 1.

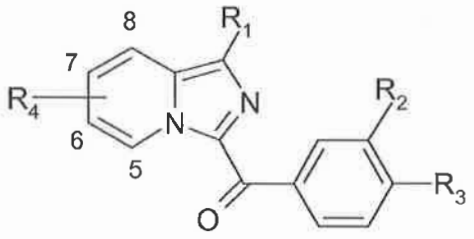
14. A pharmaceutical composition containing, as an active ingredient, a derivative of formula (I) according to Claim 1, optionally in combination with one or more suitable inert excipients.

15. The compound according to claim 1, wherein said aryl group is phenyl.

16. The compound according to Claim 6, wherein said alkyl group contains 1 to 3 carbon atoms.

CLAIMS

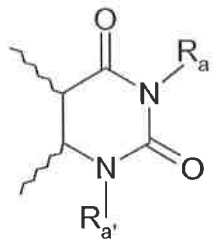
1. Compound of formula (I):



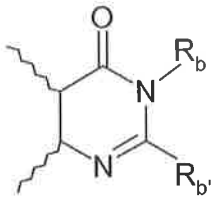
(I)

in which:

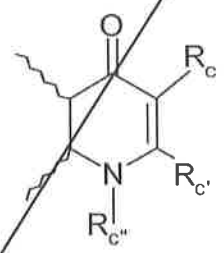
- R_1 represents
  - . a hydrogen or halogen atom,
  - . an alkyl group optionally substituted with $-COOR_5$,
  - . an alkenyl group optionally substituted with $-COOR_5$,
  - . a $-COOR_5$ or $-CONR_5R_6$ group,
  - . an $-NR_5COR_6$ or $-NR_5-SO_2R_6$ group,
  - or
  - . an aryl group, in particular phenyl, or a heteroaryl group, said aryl or heteroaryl group being optionally substituted with one or more groups selected from: halogen atoms, alkyl groups, cycloalkyl groups, $-COOR_5$, $-CF_3$, $-OCF_3$, -CN, $-C(NH_2)NOH$, $-OR_5$, -O-Alk-$COOR_5$, -O-Alk-NR_5R_6, -O-Alk-NR_7R_8, -Alk-OR_5, -Alk-$COOR_5$, $-CONR_5R_6$, -CO-NR_5-OR_6, -CO-NR_5-SO_2R_7, $-CONR_5$-Alk-NR_5R_6, $-CONR_5$-Alk-NR_7R_8, -Alk-NR_5R_6, $-NR_5R_6$, $-NC(O)N(CH_3)_2$, -CO-Alk, $-CO(OAlk)_nOH$, COO-Alk-NR_5R_6, COO-Alk-NR_7R_8 and 5-membered heteroaryl groups, said heteroaryl groups being optionally substituted with one or more groups selected from halogen atoms and alkyl, $-CF_3$, -CN, $-COOR_5$, -Alk-OR_5, -Alk-$COOR_5$, $-CONR_5R_6$, $-CONR_7R_8$, -CO-NR_5-OR_6, -CO-NR_5-SO_2R_6, $-NR_5R_6$ and -Alk-NR_5R_6 groups, or with a hydroxyl group or with an oxygen atom,
- n is an integer ranging from 1 to 3,
- R_2 and R_3 together form, with the carbon atoms of the phenyl nucleus to which they are attached, a 6-membered nitrogenous heterocycle corresponding to one of formula (A), (B) or (C) below:



(A)



(B)



(C)

in which the wavy lines represent the phenyl nucleus to which R_2 and R_3 are attached and:

. R_a represents a hydrogen atom or an alkyl, haloalkyl, -Alk-CF_3, -Alk-$COOR_5$, -Alk'-$COOR_5$, -Alk-$CONR_5R_6$, -Alk'-$CONR_5R_6$, -Alk-$CONR_7R_8$, -Alk-NR_5R_6, -AlkCONR_5-OR_6, -Alk-NR_7R_8, -Alk-cycloalkyl, -Alk-O-R_5, -Alk-S-R_5, -Alk-CN, -OR_5, -OAlkCOOR_5, -NR_5R_6, -NR_5-$COOR_6$, -Alk-aryl, -Alk-O-aryl, -Alk-O-heteroaryl, -Alk-heteroaryl or heteroaryl group, where the aryl or heteroaryl group is optionally substituted with one or more halogen atoms and/or alkyl, cycloalkyl, -CF_3, -OCF_3, -O-R_5 or -S-R_5 groups,

. $R_{a'}$ represents a hydrogen atom or a linear, branched, cyclic or partially cyclic alkyl group, or an -Alk-OR_5, -Alk-NR_5R_6 or -Alk-NR_7R_8 group, $R_{a'}$ being optionally substituted with one or more halogen atoms,

. R_b represents a hydrogen atom or an alkyl or -Alk-$COOR_5$ group,

. $R_{b'}$ represents a hydrogen atom or an alkyl, haloalkyl, cycloalkyl, phenyl or -Alk-$COOR_5$ group,

. R_c represents a hydrogen atom or an alkyl, -CN, -$COOR_5$, -CO-NR_5R_6, -$CONR_7R_8$ -CO-NR_5-Alk-NR_5R_6, -$CONR_5$-Alk-OR_5, -$CONR_5SO_2R_5$, -Alk-aryl or -Alk-heteroaryl group, where the aryl or heteroaryl group is optionally substituted with one or more halogen atoms and/or alkyl, cycloalkyl, -CF_3, -OCF_3, -O-alkyl or -S-alkyl groups,

. $R_{c'}$ represents a hydrogen atom or an alkyl group,

. $R_{c''}$ represents a hydrogen atom or an alkyl, alkenyl, haloalkyl, cycloalkyl, -Alk-NR_5R_6, -Alk-NR_7R_8, -Alk-OR_5 or -Alk-SR_5 group,

- R_4, located on position 6, 7 or 8 of the imidazopyridine nucleus, represents:

. a hydrogen atom,
. a -$COOR_5$ group,
. a -$CO\text{-}NR_5\text{-}Alk\text{-}NR_5R_6$ group,
. a -$CO\text{-}NR_5\text{-}Alk\text{-}NR_7R_8$ group, or
. a -$CO\text{-}NR_5\text{-}Alk\text{-}OR_6$ group,

- R_5 and R_6, which may be identical or different, represent hydrogen atoms, haloalkyl groups or alkyl groups, cycloalkyl groups or an Ms group,

- R_7 and R_8, which may be identical or different, represent hydrogen atoms or alkyl or phenyl groups, or else R_7 and R_8 together form a 3- to 8-membered saturated ring which can optionally contain a heteroatom,

- Alk represents a linear or branched alkylene chain, and
- Alk' represents a linear, branched, cyclic or partially cyclic alkylene chain,

optionally in the form of a pharmaceutically acceptable salt thereof.

2. Compound according to Claim 1, in which R_1 represents:

. a hydrogen or halogen atom,
. an alkyl group which is unsubstituted or substituted with -$COOR_5$,
. an alkenyl group which is unsubstituted or substituted with -$COOR_5$,
. a -$COOR_5$ group,
. a -$CONR_5R_6$ group,
. an -$NR_5\text{-}SO_2R_6$ group, or
. a phenyl group optionally substituted with one or two groups selected from:

- halogen atoms;
- alkyl groups optionally substituted with -$COOR_5$;
- –CN, -$C(NH_2)NOH$, -$COOR_5$, -$CONR_5R_6$, -$CO\text{-}NR_5\text{-}OR_6$, -$CO\text{-}NR_5\text{-}SO_2R_6$, -COAlk, –$CO(OAlk)_nOH$, -$OR_5$, -$OCF_3$, -O-Alk-$COOR_5$, -Alk-OR_5, -NR_5R_6 or -$NC(O)N(CH_3)_2$ groups,
- 5-membered heteroaryls optionally substituted with an alkyl group and/or a hydroxyl group or an oxygen atom,

in which R_5 and R_6, which may be identical or different, represent hydrogen

atoms, or alkyl groups optionally substituted with an $-NR_7R_8$ group,

R_7 represents a hydrogen atom, an alkyl group containing 1 or 2 carbon atoms or a phenyl group, n is an integer ranging from 1 to 3, or

. a heteroaryl group which is optionally condensed and/or optionally substituted with one or two groups selected from alkyl groups, OR_5, $-COOR_5$, $-NR_5R_6$ and cycloalkyl groups, and an oxygen atom, in which R_5 and R_6, which may be identical or different, represent hydrogen atoms or alkyl groups containing 1 or 2 carbon atoms,

optionally in the form of a pharmaceutically acceptable salt thereof.

3. Compound according to Claim 1, in which R_2 and R_3 together form, with the carbon atoms of the phenyl nucleus to which they are attached, a 6-membered nitrogenous heterocycle corresponding to either of formulae (A) and (B) as defined in Claim 1, optionally in the form of a pharmaceutically acceptable salt thereof.

4. Compound according to Claim 1, in which R_2 and R_3 together form, with the carbon atoms of the phenyl nucleus to which they are attached, a 6-membered nitrogenous heterocycle corresponding to formula (A) as defined in Claim 1, optionally in the form of a pharmaceutically acceptable salt thereof.

5. Compound according to any one of the preceding claims, in which formula (A) or (B) is such that:

. R_a represents a hydrogen atom or an alkyl group, optionally substituted with one or more halogens; $-AlkCONR_5R_6$; haloalkyl; $-CH_2-COOR_5$; -Alk-heteroaryl, -Alk-O-phenyl or -Alk-phenyl, where the phenyl group is optionally substituted with one or two alkyl groups and/or OR_5 and/or halogen atoms; -Alk-cycloalkyl,

. $R_{a'}$ represents a hydrogen atom or a linear, branched, cyclic or partially cyclic alkyl group, or a $-CH_2-OR_5$ or $-Alk-NR_5R_6$ group,

. R_b represents a hydrogen atom or an alkyl group,

. $R_{b'}$ represents a hydrogen atom or an alkyl, phenyl or $-CH_2-COOR_5$ group, in which the alkyl groups contain 1 to 6 carbon atoms, R_5 being as described in Claim 1,

optionally in the form of a pharmaceutically acceptable salt thereof.

6. Compound according to any one of the preceding claims, in which R_4 represents a hydrogen atom or a -COOH, -CO-NH-Alk-NR_7R_8 or -CO-NH-Alk-OH group, or else an alkyl group, preferably containing 1 to 3 carbon atoms, which is unsubstituted, in which Alk, R_7 and R_8 are as described in Claim 1.

7. Compound according to one of the preceding claims, selected from the following compounds:

6-(imidazo[1,5-a]pyridin-3-ylcarbonyl)-3-propylquinazoline-2,4(1*H*,3*H*)-dione,

3-{3-[(2,4-dioxo-3-propyl-1,2,3,4-tetrahydroquinazolin-6-yl)carbonyl]imidazo[1,5-a]pyridin-1-yl}benzoic acid,

3-[(2,4-dioxo-3-propyl-1,2,3,4-tetrahydroquinazolin-6-yl)carbonyl]imidazo[1,5-a]pyridine-6-carboxylic acid,

3-(3-{[3-(4-fluorobenzyl)-1-methyl-2,4-dioxo-1,2,3,4-tetrahydroquinazolin-6-yl]carbonyl}imidazo[1,5-a]pyridin-1-yl)benzoic acid,

3-{3[(2,4-dioxo-3-propyl-1,2,3,4-tetrahydroquinazolin-6-yl)carbonyl]imidazo[1,5-a]pyridin-1-yl}benzamide,

6-({1-[3-(5-methyl-1,3,4-oxadiazol-2-yl)phenyl]imidazo[1,5-a]pyridin-3-yl}carbonyl-3-propylquinazoline-2,4(1*H*, 3*H*)-dione,

6-({1-[3-(3-methyl-1,2,4-oxadiazol-5-yl)phenyl]imidazo[1,5-a]pyridin-3-yl}carbonyl)-3-propylquinazoline-2,4(1H, 3H)-dione,

N-{3-[(2,4-dioxo-3-propyl-1,2,3,4-tetrahydroquinazolin-6-yl)carbonyl]imidazo[1,5-a]pyridin-1-yl}methanesulphonamide,

2-morpholin-4-yl-ethyl 3-(3-{[3-(4-fluorobenzyl)-1-methyl-2,4-dioxo-1,2,3,4-tetrahydroquinazolin-6-yl]carbonyl}imidazo[1,5-a]pyridin-1-yl)benzoate,

N-[2-(dimethylamino)ethyl]-3-(3-{[3-(4-fluorobenzyl)-1-methyl-2,4-dioxo-1,2,3,4-tetrahydroquinazolin-6-yl]carbonyl}imidazo[1,5-a]pyridin-1-yl)benzamide,

3-(3-{[3-(4-fluorobenzyl)-1-propyl-2,4-dioxo-1,2,3,4-tetrahydroquinazolin-6-yl]carbonyl}imidazo[1,5-a]pyridin-1-yl)benzoic acid,

3-(4-fluorobenzyl)-1-methyl-6-[(1-pyridin-3-ylimidazo[1,5-a]pyridin-3-yl)carbonyl]quinazoline-2,4(1*H*, 3*H*)-dione,

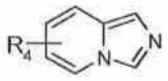
3-{3-[(2-methyl-4-oxo-3-propyl-3,4-dihydroquinazolin-6-yl)carbonyl]imidazo[1,5-a]pyridin-1-yl}benzoic acid,

3-{3-[(2-methyl-4-oxo-3-propyl-3,4-dihydroquinazolin-6-yl)carbonyl]imidazo[1,5-

a]pyridin-1-yl}benzamide,
6-(imidazo[1,5-*a*]pyridin-3-ylcarbonyl)quinazolin-4(3*H*)-one,
N,*N*,1,2-tetramethyl-4-oxo-6-{[1-(pyridin-3-yl)imidazo[1,5-*a*]pyridin-3-yl]carbonyl}-1,4-dihydroquinoline-3-carboxamide,
3-[3-({3-[2-(4-fluorophenoxy)ethyl]-1-propyl-2,4-dioxo-1,2,3,4-tetrahydroquinazolin-6-yl}carbonyl)imidazo[1,5-*a*]pyridin-1-yl]benzoic acid,
optionally in the form of a pharmaceutically acceptable salt thereof.

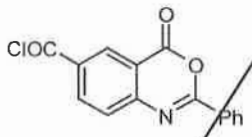
8. Process for preparing the compounds of formula (I) according to any one of Claims 1 to 7 in which R_2 and R_3 together form a nitrogenous heterocycle of formula (A) as defined in Claim 1, in which R_1 and R_a represent hydrogen atoms, characterized in that:

- the compound of formula (IV)



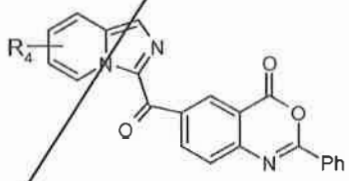
(IV)

in which R_4 is as defined in Claim 1, is condensed with the compound of formula (V)



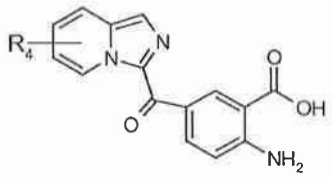
(V)

in order to obtain the compound of formula (VI)



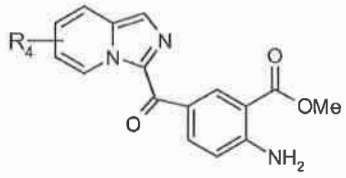
(VI)

- the compound of formula (VI) is subjected to a basic hydrolysis reaction in order to obtain the compound of formula (VII):



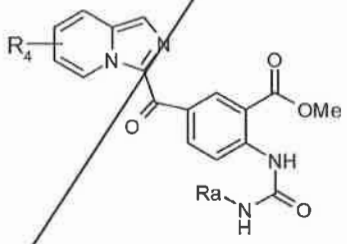
(VII)

- a reaction of esterification of the compound of formula (VII) is carried out so as to obtain the compound of formula (VIII)



(VIII)

- the compound of formula (VIII) is subjected to the action of triphosgene so as to form the isocyanate corresponding to the compound (VIII), and then this isocyanate is condensed with an amine of formula R_aNH_2, R_a being as defined in Claim 1, in order to obtain the urea of formula (IX),

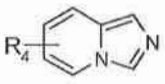


(IX)

- the urea of formula (IX) is subjected to a cyclization reaction in a basic medium.

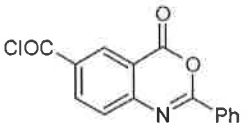
9. Process for preparing a derivative of formula (I) according to one of Claims 1 to 7 in which R_2 and R_3 together form a nitrogenous heterocycle of formula (A) as defined in Claim 1, R_1 is as defined in Claim 1, with the proviso that R_1 does not represent a hydrogen atom, and R_4 is as defined in Claim 1, characterized in that:

- the compound of formula (IV)



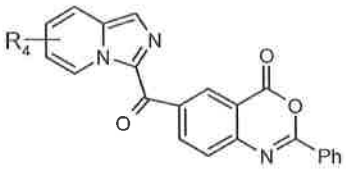
(IV)

in which R_4 is as defined in Claim 1, is condensed with the compound of formula (V)



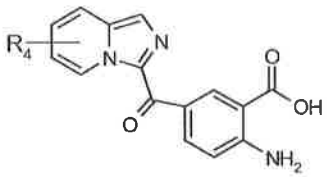
(V)

in order to obtain the compound of formula (VI)



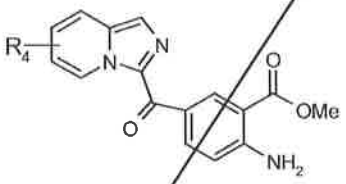
(VI)

- the compound of formula (VI) is subjected to a basic hydrolysis reaction in order to obtain the compound of formula (VII):



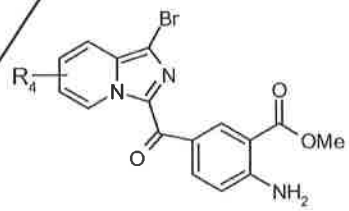
(VII)

- a reaction of esterification of the compound of formula (VII) is carried out so as to obtain the compound of formula (VIII)



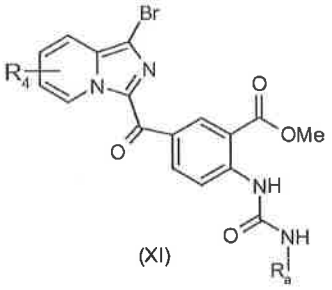
(VIII)

- the compound of formula (VIII) is subjected to a bromination reaction in order to obtain the compound of formula (X):



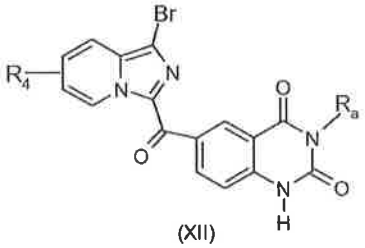
(X)

- the derivative of formula (X) is subjected to the action of triphosgene and the isocyanate corresponding to the compound of formula (X) is formed, which is condensed with an amine of formula R_aNH_2, R_a being as defined in Claim 1, in order to obtain the urea of formula (XI):



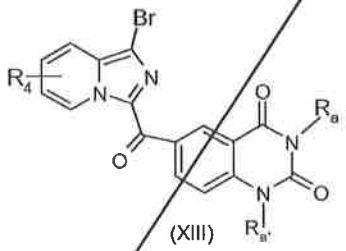
(XI)

- the compound of formula (XI) is subjected to a cyclization reaction in a basic medium in order to obtain the compound of formula (XII),



(XII)

- the compound of formula (XII) is subjected to an alkylation reaction in the presence of a base and of a halogenated derivative $R_{a'}X$, $R_{a'}$ being as defined in Claim 1, in order to obtain the compound of formula (XIII):



(XIII)

- the compound of formula (XIII) is subjected, in the presence of a palladium catalyst, of a ligand and of a base:

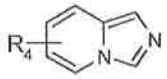
. to a reaction with phenylboronic or heteroarylboronic or phenylboronate ester or heteroarylboronate ester derivatives according to a Suzuki coupling,

. or else to an imination reaction with benzophenoneimine, followed by an acid hydrolysis and by an alkylation reaction with a sulphonyl chloride of formula R_aSO_2Cl,

. or else to a cyanation reaction with zinc cyanide, followed by an acid hydrolysis and by an esterification or a peptide coupling with an amine $R_5R_6NH_2$, R_5 and R_6 being defined in Claim 1.

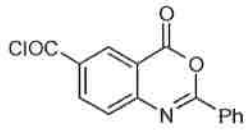
10. Process for preparing the compounds of formula (I) according to any one of Claims 1 to 7 in which R_2 and R_3 together form a nitrogenous heterocycle of formula (A) as defined in Claim 1, and in which R_1 and R_4 represent groups as defined in Claim 1, with the proviso that R_1 is not a hydrogen atom, characterized in that:

- the compound of formula (IV)



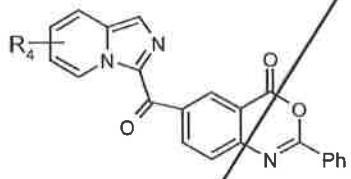
(IV)

in which R_4 is as defined in Claim 1, is condensed with the compound of formula (V)



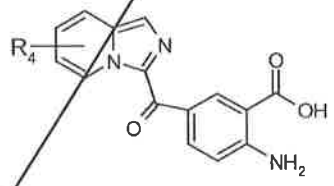
(V)

in order to obtain the compound of formula (VI)



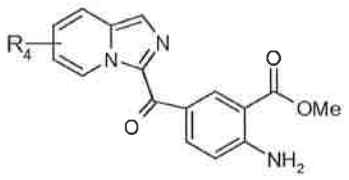
(VI)

- the compound of formula (VI) is subjected to a basic hydrolysis reaction in order to obtain the compound of formula (VII):



(VII),

- a reaction of esterification of the compound of formula (VII) is carried out so as to obtain the compound of formula (VIII):



(VIII)

- the compound of formula (VIII) is subjected to a bromination reaction in order to obtain the compound of formula (X):



(X)

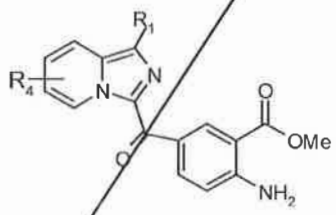
- the compound of formula (X) is subjected, in the presence of a palladium catalyst, of a ligand and of a base:

. to a reaction with phenylboronic or heteroarylboronic or phenylboronate ester or heteroarylboronate ester derivatives according to a Suzuki coupling,

. or else to an imination reaction with benzophenoneimine, followed by an acid hydrolysis and by an alkylation reaction with a sulphonyl chloride of formula R_6SO_2Cl,

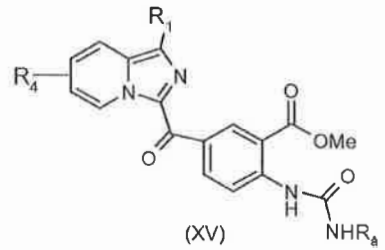
. or else to a cyanation reaction with zinc chloride, followed by an acid hydrolysis and by an esterification or a peptide coupling with an amine $R_5R_6NH_2$, R_5 and R_6 being defined in Claim 1,

in order to obtain the compound of formula (XIV):



(XIV)

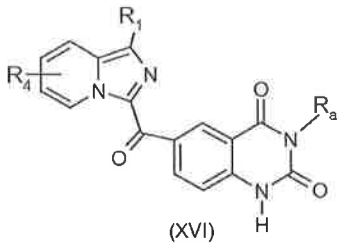
- the derivative of formula (XIV) is subjected to the action of triphosgene so as to form the corresponding isocyanate, the isocyanate obtained is condensed with an amine of formula R_aNH_2 in order to obtain the urea of formula (XV), R_a being as defined in Claim 1:



(XV)

- the derivative of formula (XV) is subjected to a cyclization reaction in a

basic medium in order to obtain the compound of formula (XVI):

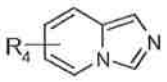


(XVI)

- the compound of formula (XVI) is subjected to an alkylation reaction in the presence of a base and of a halogenated derivative R_a-X, R_a, being as defined in Claim 1 and X being a halogen.

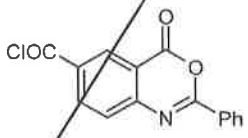
11. Process for preparing the compounds of formula (I) according to Claims 1 to 7 in which R_2 and R_3 together form a nitrogenous heterocycle of formula (A) and in which R_1 represents a group as defined in Claim 1, with the proviso that R_1 does not represent a hydrogen atom, R_4 being as defined in claim, characterized in that:

- the compound of formula (IV)



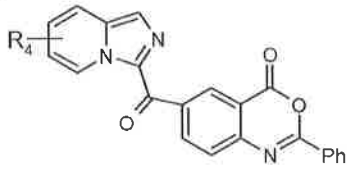
(IV)

in which R_4 is as defined in Claim 1, is condensed with the compound of formula (V)



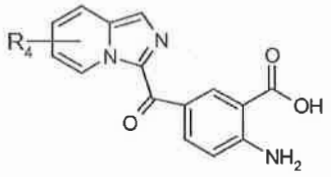
(V)

in order to obtain the compound of formula (VI)



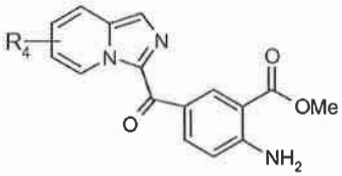
(VI)

- the compound of formula (VI) is subjected to a basic hydrolysis reaction in order to obtain the compound of formula (VII):



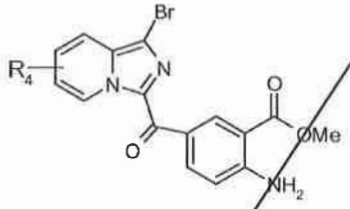
(VII) ,

- a reaction of esterification of the compound of formula (VII) is carried out so as to obtain the compound of formula (VIII)



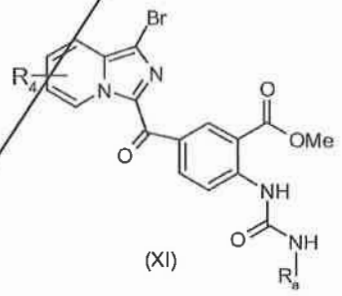
(VIII)

- the compound of formula (VIII) is subjected to a bromination reaction in order to obtain the compound of formula (X):



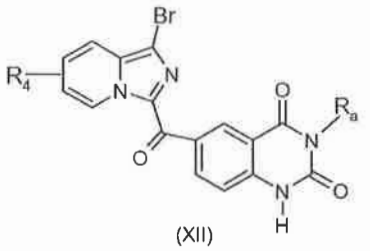
(X)

- the derivative of formula (X) is subjected to the action of triphosgene and the isocyanate corresponding to the compound of formula (X) is formed, which is condensed with an amine of formula R_aNH_2, R_a being as defined in Claim 1, in order to obtain the urea of formula (XI):



(XI)

- the compound of formula (XI) is subjected to a cyclization reaction in a basic medium in order to obtain the compound of formula (XII)



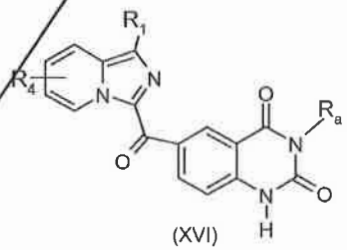
(XII)

- the compound of formula (XII) is subjected, in the presence of a palladium catalyst, of a ligand and of a base,

- to a reaction with phenylboronic or heteroarylboronic or phenylboronate ester or heteroarylboronate ester derivatives according to a Suzuki coupling,

- or else to an imination reaction with benzophenoneimine, followed by an acid hydrolysis and by a sulphonylation reaction with a sulphonyl chloride of formula R_6SO_2Cl,

- or else to a cyanation reaction with zinc cyanide, followed by an acid hydrolysis and by an esterification or a peptide coupling with an amine $R_5R_6NH_2$, R_5 and R_6 being as defined in Claim 1, in order to obtain the compound of formula (XVI) in which R_1 is as defined in Claim 1, with the proviso that R_1 does not represent a hydrogen atom,

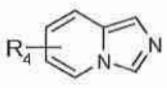


(XVI)

- the compound of formula (XVI) is subjected to an alkylation reaction in the presence of a base and of a halogenated derivative $R_{a'}X$, $R_{a'}$ being as defined in Claim 1 and X being a halogen.

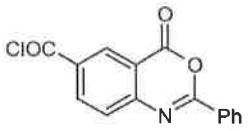
12. Process for preparing the compounds of formula (I) according to Claims 1 to 7, in which R_2 and R_3 together form a nitrogenous heterocycle of formula (B) as defined in Claim 1, R_4 being as defined in Claim 1, and R_1 represents a hydrogen atom, characterized in that:

- the compound of formula (IV)



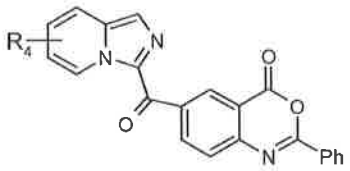
(IV)

in which R_4 is as defined in Claim 1, is condensed with the compound of formula (V)



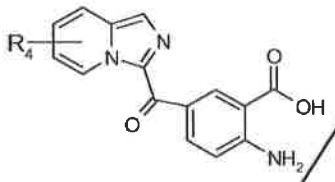
(V)

in order to obtain the compound of formula (VI)



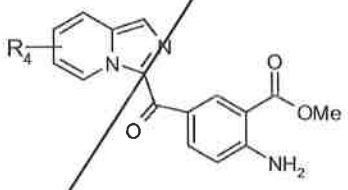
(VI)

- the compound of formula (VI) is subjected to a basic hydrolysis reaction in order to obtain the compound of formula (VII):



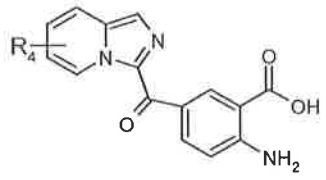
(VII)

- a reaction of esterification of the compound of formula (VII) is carried out so as to obtain the compound of formula (VIII)



(VIII)

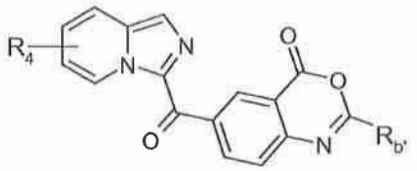
- the compound (VIII) is subjected to a saponification reaction in order to obtain the compound (XXIV):



(XXIV)

- the compound (XXIV) is then subjected to a condensation reaction with an alkyl or aryl anhydride $(R_b CO)_2O$ in order to obtain the compound of

formula (XVII),

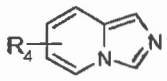


(XVII)

- the compound of formula (XVII) is subjected to a condensation reaction with an amine R_bNH_2, R_b and $R_{b'}$ being as defined in Claim 1.

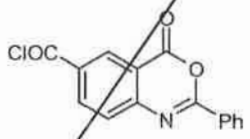
13. Process for preparing the compounds of formula (I) according to Claims 1 to 7, in which R_2 and R_3 together form a nitrogenous heterocycle of formula (B) as defined in Claim 1, R_4 being as defined in Claim 1 and R_1 being as defined in Claim 1, with the proviso that R_1 does not represent a hydrogen atom, characterized in that:

- the compound of formula (IV)



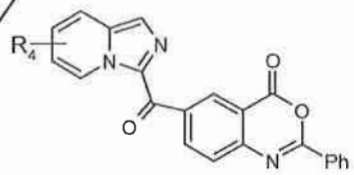
(IV)

in which R_4 is as defined in Claim 1, is condensed with the compound of formula (V):



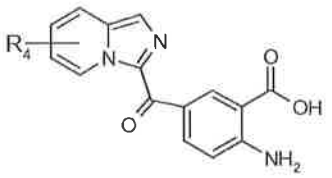
(V)

in order to obtain the compound of formula (VI):



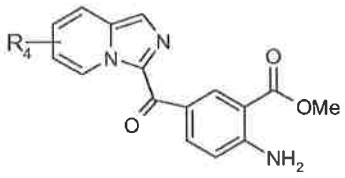
(VI)

- the compound of formula (VI) is subjected to a basic hydrolysis reaction in order to obtain the compound of formula (VII):



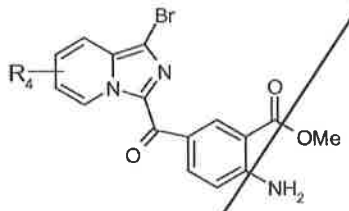
(VII) ,

- a reaction of esterification of the compound of formula (VII) is carried out so as to obtain the compound of formula (VIII):



(VIII)

- the compound of formula (VIII) is subjected to a bromination reaction in order to obtain the compound of formula (X):



(X)

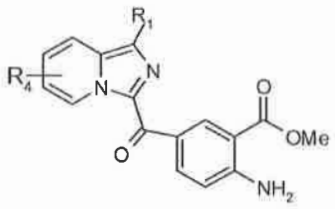
- the compound of formula (X) is subjected, in the presence of a palladium catalyst, of a ligand and of a base,

- to a reaction with phenylboronic or heteroarylboronic or phenylboronate ester or heteroarylboronate ester derivatives according to a Suzuki coupling,

- or else to an imination reaction with benzophenoneimine, followed by an acid hydrolysis and by an alkylation reaction with a sulphonyl chloride of formula R_6SO_2Cl,

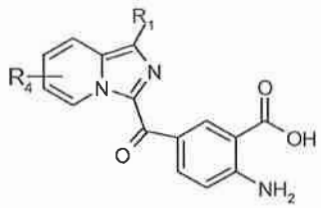
- or else to a cyanation reaction with zinc chloride, followed by an acid hydrolysis and by an esterification or a peptide coupling with an amine $R_5R_6NH_2$, R_5 and R_6 being defined in Claim 1,

- in order to obtain the compound of formula XIV:



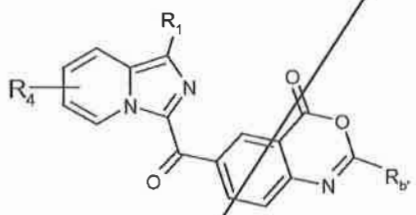
(XIV)

- the compound (XIV) is subjected to a saponification reaction in order to obtain the compound (XXV):



(XXV)

- the compound (XXV) is then subjected to a condensation reaction with an alkyl or aryl anhydride $(R_{b'}CO)_2O$, $R_{b'}$ being as defined in Claim 1, in order to obtain the compound of formula (XVIII):



(XVIII)

- the compound of formula (XVIII) is subjected to a condensation reaction with an amine R_bNH_2, R_b being as defined in Claim 1.

14. Pharmaceutical composition containing, as active ingredient, a derivative of formula (I) according to any one of Claims 1 to 7, optionally in combination with one or more suitable inert excipients.

15. Compound according to any one of Claims 1 to 7, for use thereof in the treatment and prevention of diseases requiring a modulation of b-FGFs.

16. Compound according to any one of Claims 1 to 7, for use thereof in the treatment and prevention of cancers, in particular carcinomas which

have a high degree of vascularization, such as lung, breast, prostate, pancreatic, colon, kidney and oesophageal carcinomas, cancers which induce metastases, such as colon cancer, liver cancer and stomach cancer, melanomas, gliomas, lymphomas, leukaemias, and also thrombopenias.

17. Compound according to Claim 16, for use thereof in combination with one or more anticancer active ingredient(s) and/or with radiotherapy and/or with any anti-VEGF treatment.

18. Compound according to any one of Claims 1 to 7, for use thereof in the treatment and prevention of cardiovascular diseases, such as atherosclerosis or post-angioplasty restenosis, diseases related to complications that occur following the implantation of endovascular stents and/or aortocoronary bypasses or other vascular grafts, cardiac hypertrophy, vascular complications of diabetes, such as diabetic retinopathies, liver, kidney and lung fibroses, neuropathic pain, chronic inflammatory diseases, such as rheumatoid arthritis or IBD, prostatic hyperplasia, psoriasis, clear cell acanthoma, osteoarthritis, achondroplasias (ACH), hypochondroplasias (HCH), TD (thanatophoric dysplasia), obesity, and macular degeneration, such as age-related macular degeneration (ARMD).