

NEW IMIDAZOLONE DERIVATIVES AS INHIBITORS OF PROTEIN KINASES IN PARTICULAR
DYRK1A, CLK1 AND/OR CLK4

FIELD OF THE INVENTION

5 The present invention relates to Leucettinibs, a class of new compounds useful
as a medicament. Said new compounds are in particular useful as kinase inhibitors, and
even more particularly as inhibitors of DYRK1A and/or CLK1 and/or CLK4. They are
efficient for treating and/or preventing cognitive deficits associated with Down syndrome;
Alzheimer's disease and related diseases; dementia; tauopathies; Parkinson's disease; other
10 neurodegenerative diseases; CDKL5 Deficiency Disorder; type 1 and type 2 diabetes;
abnormal folate and methionine metabolism; osteoarthritis; Duchenne muscular dystrophy;
several cancers and leukemias, viral infections and for regulating body temperature.

Some of said compounds are further inhibitors of other kinases and namely other
DYRKs (DYRK1B, 2, 3, 4) and the closely related cdc2-like kinases (CLKs)
15 (CLK 2, 3, 4). Said compounds may then further be efficient for treating and/or preventing
Phelan-McDermid syndrome; autism; viral infections, cancers, neuroinflammation, anemia
and infections caused by unicellular parasites.

It further relates to the pharmaceutical compositions containing said new
compounds and to the chemical synthesis processes for obtaining them.

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BACKGROUND

The DYRK and CLK kinase families belong to the CMGC group of kinases
which also includes the mitogen-activated protein kinases (MAPK), cyclin-dependent
kinases (CDKs) and glycogen synthase kinase-3 (GSK-3). They phosphorylate many
25 substrates involved in signaling pathways. DYRKs and CLKs play key roles in mRNA
splicing, chromatin transcription, DNA damage repair, cell survival, cell cycle,
differentiation, homocysteine/methionine/folate regulation, endocytosis, neuronal
development and functions, synaptic plasticity.

DYRK1A and Down syndrome (DS)

30 The gene encoding **DYRK1A** is located on chromosome 21, in particular in the
“**Down syndrome critical region**” (DSCR), the triploidy of which is responsible for most
DS-associated deficiencies. There is considerable genetic and pharmacological evidence

showing that the mere 1.5-fold overexpression of **DYRK1A** is responsible for most cognitive deficits, especially memory and learning deficits, observed in DS patients (Rueda N et al., 2020. Translational validity and implications of pharmacotherapies in preclinical models of Down syndrome. Prog Brain Res 251, 245). Pharmacological or genetical
 5 normalization of DYRK1A levels restores cognitive functions (Nguyen TL et al., 2017. Dual-specificity tyrosine phosphorylation-regulated kinase 1A (DYRK1A) inhibitors: a survey of recent patent literature. Expert Opin. Ther. Pat. 27, 1183-1199; Nguyen TL et al., 2018. Correction of cognitive deficits in mouse models of Down syndrome by pharmacological inhibitor of DYRK1A. Dis. Model Mech. 11, dmm035634).

10 ***DYRK1A and Alzheimer's disease (AD), Tauopathies***

There is mounting evidence for a role of **DYRK1A** in the onset of AD. **DYRK1A** phosphorylates key substrates involved in AD and dementia: Tau, septin 4, amyloid precursor protein (APP), presenilin 1, neprilysin, Munc18-1, α -synuclein, RCAN1, β -Tubulin. There is evidence for abnormal expression and post-translational
 15 modifications of DYRK1A in AD. By modulating alternative splicing of exon 10, **DYRK1A** favors the production of the 3R-Tau splice isoform (characteristic for DS/AD/tauopathy) over the normal 4R-Tau isoform. **DYRK1A** inhibition promotes autophagy which could counterbalance the autophagy deficit seen in AD.

20 ***DYRK1A and Parkinson's disease (PD) and Pick disease***

GWAS studies have revealed that **DYRK1A** is a risk factor for PD (Nalls MA et al., 2019. Identification of novel risk loci, causal insights, and heritable risk for Parkinson's disease: a meta-analysis of genome-wide association studies. Lancet Neurol 18, 1091). DYRK1A phosphorylates key factors for PD such as Parkin, septin 4, α -synuclein. Upregulation of micro-RNA specific for PD target DYRK1A expression (Chiu
 25 CC et al., 2019. Upregulated expression of microRNA-204-5p leads to the death of dopaminergic cells by targeting DYRK1A-mediated apoptotic signaling cascade. Front Cell Neurosci 13, 399). There is further evidence that **DYRK1A** expression is increased in PD. DYRK1A is overexpressed in Pick disease.

30 ***DYRK1A and other diseases (viral infections, type 1 and type 2 diabetes, cancers)***

DYRK1A and **DYRK1B** are utilized during HCMV placental replication. Inhibition of **DYRKs** prevent replication of various viruses including Herpes virus,

cytomegalovirus and HIV-1. **DYRK1A** inhibitors stimulate the proliferation of pancreatic, insulin-producing β -cells, a promising approach to type 1 and type 2 diabetes (Ackeifi C et al., 2020. Pharmacologic and genetic approaches define human pancreatic β cell mitogenic targets of DYRK1A inhibitors. JCI Insight 5, e132594; Kumar K et al., 2021. DYRK1A inhibitors as potential therapeutics for β -Cell regeneration for diabetes. J Med Chem. 2021 Mar 8. doi: 10.1021/acs.jmedchem.0c02050. Epub ahead of print. PMID: 33682417). There is abundant literature linking **DYRK1A** with cancer. The most prominent examples are megakaryoblastic leukemia, acute lymphoblastic leukemia, pancreatic cancer and brain tumor (glioblastoma).

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Accordingly, abnormalities in **DYRK1A** dosage are associated with cognitive disorders observed in Down syndrome, and Alzheimer's disease. DYRK1A is a risk factor for Parkinson's disease. Inhibition of DYRK1A additionally triggers the proliferation of pancreatic, insulin-producing β -cells. DYRK1A inhibitors may thus find applications in preventing and/or treating DS, AD, and other Tauopathies, dementia, PD, Niemann-Pick Type C Disease, CDKL5 deficiency disorder, type 1 and type 2 diabetes, viral infections, several cancers (leukemia, pancreatic cancer, glioblastoma), osteoarthritis, infections caused by unicellular parasites and for regulating body temperature.

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Other DYRKs and human disease

DYRK1B is involved in the replication of various viruses including hepatitis C virus, Chikungunya virus, Dengue virus and SARS coronavirus, cytomegalovirus and human papillomavirus. Like **DYRK1A**, **DYRK1B** inhibition leads to the proliferation of pancreatic, insulin-producing β -cells. **DYRK1B** is involved in neuroinflammation. Targeting **DYRK1B** provides a new rationale for treatment of various cancers such as liposarcoma or breast cancers.

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DYRK2, in association with GSK-3 β , regulates neuronal morphogenesis. **DYRK2** is involved in various ways in cancer development.

DYRK3 promotes hepatocellular carcinoma. **DYRK3** couples stress granule condensation/dissolution to mTORC1 signaling. **DYRK3** regulates phase transition of membraneless organelles in mitosis. **DYRK3** and **DYRK4** are involved in the regulation of cytoskeletal organization and process outgrowth in neurons.

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DYRK1A decreases axon growth, **DYRK3** and **DYRK4** increase dendritic branching and **DYRK2** decreases both axon and dendrite growth and branching.

CLKs and human disease

5 Note that **CLK** is a confusing abbreviation as it has the following meanings: (a) monooxygenase CLK-1 (human homologue COQ7); (b) Collectin-K1 (CL-K1, or CL-11), a multifunctional Ca(2+)-dependent lectin; (c) MAPK gene of the maize pathogen *Curvularia lunata*, Clk1; (d) mitochondrial membrane-bound enzyme Clock-1 (CLK-1); (e) *Colletotrichum lindemuthianum* kinase 1 (clk1).

10 **CLKs** play essential functions in alternative splicing. **CLKs** act as a body-temperature sensor which globally controls alternative splicing and gene expression. The activity of **CLKs** is indeed highly responsive to physiological temperature changes, which is conferred by structural rearrangements within the kinase activation segment (Haltenhof T et al., 2020. A conserved kinase-based body-temperature sensor globally controls
15 alternative splicing and gene expression. Mol Cell 78, 57).

CLK1 and human disease

CLK1 triggers periodic alternative splicing during the cell division cycle. **CLK1** regulates influenza A virus mRNA splicing and its inhibition prevents viral replication. **CLK1** and **CLK2** also regulates HIV-1 gene expression. **CLK1** is an
20 autophagy inducer. **CLK1** inhibition may prevent chemoresistance in glioma and **CLK1** inhibition by TG693 allows the skipping of mutated exon 31 of the dystrophin gene in Duchenne Muscular Dystrophy.

Other CLKs and human disease

Inhibition of **CLK2** has been proposed as a way to improve neuronal functions
25 and combat intellectual disability and autism in Phelan-McDermid syndrome (PMDS). Dual inhibition of **CLK2** and **DYRK1A** by Lorecivint is a potential disease-modifying approach for knee osteoarthritis. **CLK2** inhibition compromises MYC-driven breast tumors, triple negative breast cancer and glioblastoma. Inhibition of **CLK2** improves autistic features in Phelan-McDermid syndrome (PMDS). Alternative splicing of Tau exon
30 10 is regulated by **CLK2** and other **CLKs**, leading to changes in the 3R/4R isoforms ratio and neurodegeneration in sporadic AD. Inhibition of **CLK2**, **CLK3**, **CLK4** blocks HIV-1 production. By regulating alternative splicing **CLKs** modulate the balance between pro-

apoptotic and anti-apoptotic regulators, and inhibition of **CLKs** may thus find applications in the treatment of numerous cancers.

CLK3 contributes to hepatocellular carcinoma and prostate cancer.

The following Table 1 summarizes the implication of the DYRKs and CLKs

5 kinases in various diseases.

Table 1

Kinase target	Disease
DYRK1A	Down syndrome (DS)
DYRK1A	Alzheimer's disease (AD) and other Tauopathies
DYRK1A	Parkinson's disease
DYRK1A	Pick disease
DYRK1A	CDKL5 Deficiency Disorder
DYRK1A	Type 1 and Type 2 diabetes
DYRK1A	Abnormalities in folate and methionine metabolism
DYRK1A	Glioblastoma
DYRK1A	Head and neck squamous cell carcinoma
DYRK1A	Pancreatic ductal adenocarcinoma
DYRK1A	Megakaryoblastic leukemia
DYRK1A	Acute Lymphoblastic Leukemia (ALL)
DYRK1A	Knee osteoarthritis
DYRK1A	Human immunodeficiency virus type 1 (HIV-1)
DYRK1A, DYRK1B	Human cytomegalovirus (HCMV)
DYRK1B	Hepatitis C virus, Chikungunya virus, Dengue virus and Severe acute respiratory syndrome coronavirus, Cytomegalovirus, Human papillomavirus
DYRK1B	Type 1 and Type 2 diabetes
DYRK1B	Neuroinflammation
DYRK1B	Liposarcoma, Breast cancer, Hedgehog/GLI-dependent cancer
DYRK2	Triple-negative breast cancer (TNBC) and multiple myeloma (MM)
DYRK2	Glioblastoma
DYRK3	Hepatocellular carcinoma
DYRK3	Influenza virus replication
DYRK3	Anemia
DYRKs	Glioblastoma
DYRKs	Herpes simplex virus, cytomegalovirus, varicella-zoster virus
LmDYRK1	Leishmaniasis
TbDYRK	<i>Trypanosoma brucei</i>
CLK1	Glioblastoma
CLK1	Duchenne muscular dystrophy
CLK1	Influenza A
CLK2	HIV-1
CLK1/CLK2	Triple-negative breast cancer

Kinase target	Disease
CLK2	Autism, Phelan-McDermid syndrome (PMDS)
CLK2	Knee osteoarthritis
CLK2	Breast cancer, Triple negative breast cancer, Glioblastoma
CLK2	Alzheimer's disease (alternative splicing of Tau exon 10)
CLK3	Hepatocellular carcinoma, Prostate cancer
CLKs	Body temperature
CLKs	Prostate cancer, Gastrointestinal cancer
PfCLKs	Malaria
DYRKs/CLKs	Glioblastoma and numerous other cancers

DYRKs and CLK inhibitors

Several DYRK1A inhibitors have been reported in recent years. Most DYRK1A inhibitors also inhibit DYRK1B, 2, 3, 4, as well as the closely related CLK1, 2, 3, 4, with several possible inhibition profiles.

Some imidazolone derivatives, named **Leucettines** in the text below, were disclosed in WO2009/050352 as kinase inhibitors and more particularly as inhibitors of the DYRK1A kinase.

There is still a need to identify new compounds for treating and/or preventing the diseases as recited above, and particularly through the inhibition, and in particular selective inhibition, of DYRK1A, other DYRKs and the related CLKs kinases.

SUMMARY OF THE INVENTION

It has now been found that the compounds as defined in formula (I) herein after are useful in the treatment and/or prevention of a disease selected from cognitive deficits associated with Down syndrome; Alzheimer's disease and related diseases; dementia; tauopathies; Parkinson's disease; other neurodegenerative diseases; CDKL5 Deficiency Disorder; Phelan-McDermid syndrome; autism; type 1 and type 2 diabetes; abnormal folate and methionine metabolism; osteoarthritis; several cancers and leukemias; neuroinflammation, anemia, infections caused by unicellular parasites, viral infections and for regulating body temperature.

The present invention therefore relates to a compound of formula (I), as defined below.

The present invention further relates to a compound of formula (I) as defined below for use as a medicament.

The present invention further relates to a compound of formula (I) as defined below for use in the treatment and/or prevention of a disease selected from cognitive deficits associated with Down syndrome; Alzheimer's disease and related diseases; dementia; tauopathies; Parkinson's disease; other neurodegenerative diseases; CDKL5
5 Deficiency Disorder; Phelan-McDermid syndrome; autism; type 1 and type 2 diabetes; abnormal folate and methionine metabolism; osteoarthritis; several cancers and leukemias, neuroinflammation, anemia, infections caused by unicellular parasites, viral infections and for regulating body temperature.

The present invention further relates to a pharmaceutical composition
10 comprising it and to a process for manufacturing it.

The present invention at last relates to synthetic intermediates of formula (II) as defined below.

DEFINITIONS

15 As used herein, the term "patient" refers to either an animal, such as a valuable animal for breeding, company or preservation purposes, or preferably a human or a human child, which is afflicted with, or has the potential to be afflicted with one or more diseases and conditions described herein.

In particular, as used in the present application, the term "patient" refers to a
20 mammal such as a rodent, cat, dog, primate or human, preferably said subject is a human and also extends to birds.

The identification of those patients who are in need of treatment of herein-described diseases and conditions is well within the ability and knowledge of one skilled in the art. A veterinarian or a physician skilled in the art can readily identify, by the use of clinical
25 tests, physical examination, medical/family history or biological and diagnostic tests, those patients who are in need of such treatment.

In the context of the invention, the term "treating" or "treatment", as used herein, means preventing, reversing, alleviating, inhibiting the progress of, or preventing the disease and its cognitive, motor or metabolic changes resulting from high DYRK1A kinase and/or
30 CLK1 expression and activity, and optionally associated with the abnormalities in other DYRKs (DYRK1B, 2, 3, 4) and the closely related further cdc2-like kinases (CLKs)

(CLK 2, 3, 4) and more particularly in connection to the diseases as described herein after in the paragraph "PATHOLOGIES".

Therefore, the term "treating" or "treatment" encompasses within the framework of the present invention the improvement of medical conditions of patients suffering from the diseases as described herein after in the paragraph "PATHOLOGIES", related to high expression and activity of any of the DYRK1A and CLK1 kinases, and optionally associated with the abnormalities in other DYRKs (DYRK1B, 2, 3, 4) and the closely related cdc2-like kinases (CLKs) (CLK 2, 3, 4).

As used herein, an "effective amount" refers to an amount of a compound of the present invention which is effective in preventing, reducing, eliminating, treating or controlling the symptoms of the herein-described diseases and conditions.

The term "controlling" is intended to refer to all processes wherein there may be a slowing, interrupting, arresting, or stopping of the progression of the diseases and conditions described herein, but does not necessarily indicate a total elimination of all disease and condition symptoms, and is intended to include prophylactic treatment.

The term "effective amount" includes "prophylaxis-effective amount" as well as "treatment-effective amount".

The term "preventing", as used herein, means reducing the risk of onset or slowing the occurrence of a given phenomenon, namely in the present invention, a disease resulting from abnormal DYRKs/CLKs kinase activity, in particular DYRK1A kinase activity.

As used herein, « *preventing* » also encompasses « *reducing the likelihood of occurrence* » or « *reducing the likelihood of reoccurrence* ».

The term "*prophylaxis-effective amount*" refers to a concentration of compound of this invention that is effective in inhibiting, preventing, decreasing the likelihood of anyone of the hereabove described diseases.

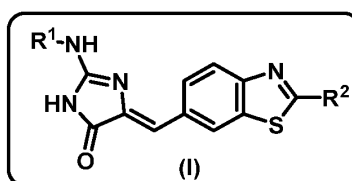
Likewise, the term "treatment-effective amount" refers to a concentration of compound that is effective in treating the hereabove described diseases, *e.g.* leads to a reduction or normalization DYRK1A and/or CLK1 kinase activity, and optionally additionally of DYRKs/CLKs kinase activity in general, following examination when administered after disease has occurred.

As used herein, the term "pharmaceutically acceptable" refers to those compounds, materials, excipients, compositions or dosage forms which are, within the scope of sound medical judgment, suitable for contact with the tissues of human beings and animals without excessive toxicity, irritation, allergic response or other problem complications commensurate
 5 with a reasonable benefit/risk ratio.

DETAILED DESCRIPTION OF THE INVENTION

The inventors have surprisingly found that the compounds of formula (I) as disclosed herein after inhibit the DYRK1A, other DYRKs (DYRK1B, DYRK2, DYRK3,
 10 DYRK4) and CLKs (CLK1, CLK2, CLK3, CLK4). This assertion is based on data as illustrated in the following examples and more detailed herein after.

According to a first aspect, a subject-matter of the present invention relates to a compound of formula (I)



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wherein R^1 represents:

- (i). a (C_1-C_6) alkyl group substituted by one or two groups selected from a $-COOR^a$ group, a hydroxy group, a halogen atom, a (C_1-C_4) alkoxy group and a benzyloxy group, said benzyloxy being
 20 optionally substituted on its phenyl group by one to three halogen atoms,
- (ii). a spiro(C_5-C_{11})bicyclic ring,
- (iii). a fused phenyl group, selected from phenyl groups fused with a (C_5-C_6) cycloalkyl or (C_5-C_6) heterocycloalkyl, which (C_5-C_6) cycloalkyl and (C_5-C_6) heterocycloalkyl ring optionally comprise an insaturation and
 25 is optionally substituted by a (C_1-C_4) alkyl group, a hydroxy group, a halogen atom, a (C_1-C_3) alkoxy group or a $-COR^a$ group,
- (iv). a phenyl group, substituted by one or two groups selected from a (C_1-C_8) alkyl, a (C_1-C_3) fluoroalkyl, a fluoro(C_1-C_4)alkoxy group, a halogen atom, and a (C_4-C_7) heterocycloalkyl group, said

(C₄-C₇)heterocycloalkyl group being itself optionally substituted by a (C₁-C₄) alkyl group, or

(v). a R'-L- group, wherein L is either a single bond or a (C₁-C₃)alkanediyl group, optionally substituted by a group selected from a hydroxy group and a (C₁-C₃)alkoxy group, and

R' represents:

(v.1) a (C₃-C₈)cycloalkyl group, optionally substituted by one, two or three groups selected from a (C₁-C₄)alkyl group, a hydroxy group, a halogen atom and a (C₁-C₃) alkoxy group,

(v.2) a bridged (C₆-C₁₀)cycloalkyl group, optionally substituted by one to three groups selected from a (C₁-C₄)alkyl group, a (C₁-C₄)alkoxy group, a halogen atom, a hydroxy group, a -O-C(O)-R^d group, a -O-C(O)-NHR^d group and a -NH-C(O)-R^d group, a -SO₂-R^d group, a -N(R^e)₂ group and a -COOR^a group,

(v.3) a (C₃-C₈)heterocycloalkyl group, optionally substituted by one to three groups selected from a -COOR^a group, a hydroxy group, a halogen atom, a (C₁-C₄)alkyl group and an oxo group,

(v.4) a (C₃-C₈)heteroaryl group, optionally substituted by one to three groups selected from a halogen atom, a (C₁-C₄)alkyl group, a (C₁-C₄)alkoxy group and a *N*-methylpiperazinyl group, or

(v.5) a bridged (C₆-C₁₀)heterocycloalkyl group, or

(vi). a R'-L- group wherein L is a (C₁-C₃)alkanediyl group, optionally substituted by a group selected from a -NR^bR^c group, a (C₁-C₄)alkoxy group, a hydroxy group, a -COOR^a group and a halogen atom, and

R' is a phenyl group, optionally substituted by one to three groups selected from the group consisting of (C₁-C₆)alkyl group, a fluoro(C₁-C₄)alkyl group and a fluoro(C₁-C₄)alkoxy group, a halogen atom and a hydroxy group,

R^a represents a (C₁-C₄)alkyl group or a hydrogen atom,

R^b and R^c independently represent a (C₁-C₆)alkyl group or a hydrogen atom,

R^d represents a (C₁-C₄)alkyl group or a cyclopropyl group,

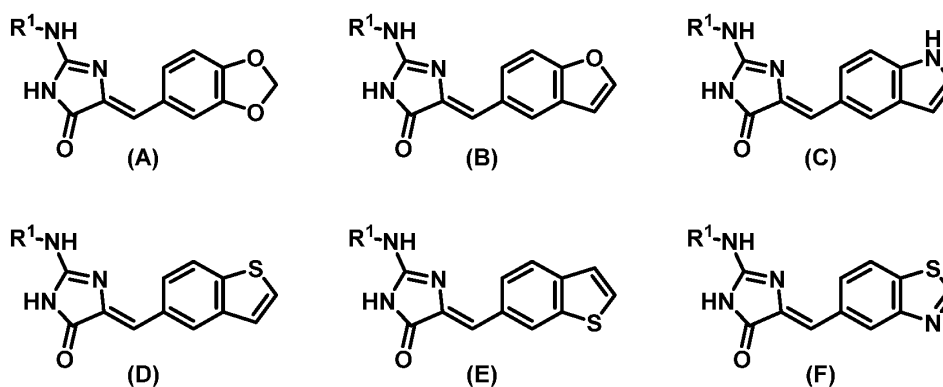
R^e represents a (C₁-C₃)alkyl group, and

R^2 represents a hydrogen atom or a (C₁-C₃)alkyl group,

or any of its pharmaceutically acceptable salt.

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The inventors have surprisingly discovered that compounds having the following scaffolds of formula (A) to (F) displayed much reduced kinase inhibitory activities on DYRK1A and other related kinases compared to their benzothiazole homologs (compounds according to the invention): IC₅₀ values were reduced by 10 to 1000
10 -fold factors, and some compounds were completely inactive at the highest dose tested (10 μM).



These much-reduced kinase inhibitory activities have been verified, for example, by individual comparison of a compound of formula (I) and of a compound
15 having a scaffold of formula (A) to (F), wherein in both, R^2 is a hydrogen atom and R^1 is selected from the group consisting of cyclohexyl, cycloheptyl, cyclooctyl, 2-methoxy-1-phenyl-ethyl.

According to a particular embodiment, the present invention relates to a compound of formula (I) as defined herein above wherein R^1 represents:

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- (i). a (C₂-C₆)alkyl group substituted by one or two groups selected from a -COOR^a group, a hydroxy group, a halogen atom, a (C₁-C₄)alkoxy group and a benzyloxy group, said benzyloxy being optionally substituted on its phenyl group by one to three halogen atoms,
- (ii). a spiro(C₇-C₉)bicyclic ring,

- (iii). a fused phenyl group, selected from phenyl groups fused with a cyclopentyl or a heterocyclopentyl, which cyclopentyl and heterocyclopentyl group optionally comprise an insaturation and is optionally substituted by a (C₁-C₄) alkyl group, a hydroxy group, a halogen atom, a (C₁-C₃)alkoxy group or a -COR^a group,
- (iv). a phenyl group, substituted by one or two groups selected from (C₁-C₈)alkyl, a (C₁-C₃)fluoroalkyl, a fluoro(C₁-C₄)alkoxy group a halogen atom, and a (C₄-C₇)heterocycloalkyl group, said (C₄-C₇)heterocycloalkyl group being itself optionally substituted by a (C₁-C₄) alkyl group, or
- (v). a R'-L- group wherein
- L is either a single bond or a (C₁-C₃)alkanediyl group, optionally substituted by a group selected from a hydroxy group and a (C₁-C₃)alkoxy group, and
 - R' represents:

(v.1) a (C₃-C₈)cycloalkyl group, optionally substituted by one, two or three groups selected from a (C₁-C₄)alkyl group, a hydroxy group, a fluor atom and a (C₁-C₃) alkoxy group,

(v.2) a bridged (C₇-C₁₀)cycloalkyl group, optionally substituted by one to three groups selected from a (C₁-C₄)alkyl group, a (C₁-C₄)alkoxy group, a hydroxy group, a halogen atom, a -O-C(O)-R^d group, a -O-C(O)-NHR^d group, a -NH-C(O)-R^d group, a -SO₂-R^d group, a -N(R^e)₂ group and a -COOR^a group,

(v.3) a (C₄-C₇)heterocycloalkyl group, optionally substituted by one to three groups selected from a -COOR^a group, a hydroxy group, a halogen atom, a (C₁-C₄)alkyl group and a oxo group,

(v.4) a heteroaryl group, optionally substituted by one to three groups selected from a halogen atom, (C₁-C₄)alkyl group, a (C₁-C₄)alkoxy group, a *N*-methylpiperazinyl group, or

(v.5) a bridged (C₆-C₁₀)heterocycloalkyl group, or
- (vi). a R'-L- group wherein

- L is a (C₁-C₃)alkanediyl group, optionally substituted by a group selected from a -NR^bR^c group, a (C₁-C₃)alkoxy group, a hydroxy group, a -COOR^a group and a halogen atom, and
 - R' is a phenyl group, optionally substituted by one to three groups selected from the group consisting of (C₁-C₆)alkyl group, a fluoro(C₁-C₄)alkyl group and a fluoro(C₁-C₄)alkoxy group, a hydroxy group and a halogen atom,
- 10 R^a represents a (C₁-C₄)alkyl group or a hydrogen atom,
 R^b and R^c independently represent a (C₁-C₆)alkyl group or a hydrogen atom,
 R^d represents a (C₁-C₄)alkyl group or a cyclopropyl group,
 R^e represents a (C₁-C₃)alkyl group, and
 R² represents a hydrogen atom or a (C₁-C₃)alkyl group,
 15 or any of its pharmaceutically acceptable salt.

According to another particular embodiment, the present invention relates to a compound of formula (I) as defined herein above wherein R¹ represents:

- (i). a (C₂-C₆)alkyl group substituted by one or two groups selected from a -COOCH₃ group, a hydroxy group, a fluorine atom, a methoxy group, an ethoxy group, a *tert*-butoxy group, a cyclopropoxy group and a benzyloxy group, said benzyloxy being optionally substituted on its phenyl group by a fluorine atom,
- (ii). a spiro(C₇-C₈)bicyclic ring, in particular a spiro[3.3]heptyl, a spiro[2.5]octanyl or a 7-azaspiro[3.5]nonyl,
- (iii). a fused phenyl group, chosen from phenyl groups fused with a cyclopentyl or a heterocyclopentyl, which cyclopentyl and heterocyclopentyl group optionally comprise an insaturation and is optionally substituted by a methyl, a hydroxy group, a methoxy group and a -COCH₃ group,
- (iv). a phenyl group, substituted by one or two groups selected from a methyl, a hexyl, a trifluoromethyl, a difluoromethoxy group, a

halogen atom, in particular a fluor atom, a morpholino group and a *N*-methylpiperazinyl group, or

(v). a $R'-L$ - group wherein L is either a single bond or a (C_1-C_3) alkanediyl group, optionally substituted by a group chosen from

a hydroxy group and a (C_1-C_3) alkoxy group,

and R' is selected from the group consisting of:

(v.1). a (C_3-C_8) cycloalkyl group in particular a cyclopropyl, a cyclobutyl, a cyclopentyl, a cyclohexyl, a cycloheptyl or a cyclooctyl, optionally substituted by one, two or three groups selected from a methyl, an isopropyl, a hydroxy group and a methoxy group,

(v.2). a bridged (C_7-C_{10}) cycloalkyl group, in particular an adamantyl or a bicyclo[3.1.1]heptyl, optionally substituted by one to three groups selected from a methyl group, a methoxy group, a hydroxy group, a fluorine atom, a $-O-C(O)-CH_3$ group, a $-O-C(O)-C(CH_3)_3$ group, a $-O-C(O)-NH-C(CH_3)_3$ group, a $-NH-C(O)-CH_3$ group, a $-NH-C(O)-C_3H_4$ group, a $-S(O)_2-CH_3$ group, a $-S(O)_2-C_3H_4$ group, a $-N(CH_3)_2$ group and a $-C(O)-O-CH_3$ group,

(v.3). a (C_5-C_8) heterocycloalkyl group, in particular a tetrahydropyranyl, a piperidinyl, an oxetanyl, a tetrahydrofuranyl or an oxepanyl, a tetrahydrothiopyranyl, a pyrrolidinyl, a dioxepanyl or a piperidinyl, optionally substituted by one, two or three group(s) selected from a $-COOR^f$ group, a hydroxy group, a methyl group, and an oxo group, wherein R^f represents either an ethyl or an isopropyl group,

(v.4). a heteroaryl group, in particular a pyrimidinyl, a pyridinyl, a thiazolyl, a imidazolyl, a pyrazolyl, a thiadiazolyl, a pyridazinyl, a pyrazinyl, a furyl, optionally substituted by one to three groups selected from methyl group, a methoxy group and a *N*-methylpiperazinyl group, or

(v.5). a bridged (C₇-C₁₀)cycloalkyl group, in particular a quinuclidine-3-yl, or

(vi). a R'-L- group wherein L is a (C₁-C₃)alkanediyl group, optionally substituted by a group selected from the group consisting of a -NR^bR^c group, a (C₁-C₄)alkoxy group, a hydroxy group, a -COOR^a group and a halogen atom, in particular a fluor atom, and

R' is a phenyl group, optionally substituted by one or two groups selected from the group consisting of methyl group, a trifluoromethyl group and a trifluoromethoxy group,

10 R^a representing a (C₁-C₃)alkyl group,

R^b and R^c are independently chosen from a methyl group or a hydrogen atom, and

R² represents a hydrogen atom or a (C₁-C₃)alkyl group,

or any of its pharmaceutically acceptable salts.

15 According to another particular embodiment, the present invention relates to a compound of formula (I) as defined herein above wherein R¹ is a R'-L- group wherein L is selected from a group consisting of a -CH₂- group, a -CH(CH₃)- group, a -CH(CH₂OH)-CH₂- group, a -CH(CH₂OH)- group, a -CH(CH₂OCH₃)- group, a -CH(OH)-CH₂- group, a -CH₂-CH(CH₂OCH₃)- group, a -CH(OCH₃)-CH₂- group, a -CH₂-CH(COOCH₃)- group, a -CH(CH₂F)- group, a -CH(CH₂NH₂)- group, a -CH(CH₂NHCH₃)- group, a -CH(CH₂N(CH₃)₂)- group, a -CH₂-CH(CH₂OH)- group, a -CH(OCH₃)-CH₂- group, a -CH₂-CH(OCH₃)- group, a -CH₂-CH(OH)-CH₂- group, a -CH₂-CH(OCH₃)-CH₂ group, a -(CH₂)₃- group, a -(CH₂)₂- group and a -CH(CH₂OC(CH₃)₃) group or any of its pharmaceutically acceptable salts.

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According to another particular embodiment, the present invention relates to a compound of formula (I) as defined herein above wherein R¹ is a R'-L- group wherein:

(v.1). when R' is a (C₃-C₈)cycloalkyl group, L is selected from the group consisting of a single bond, a -CH₂- group, a -CH(CH₃)- group, a -CH(CH₂OH)-CH₂- group, a -CH(CH₂OH)- group, a -CH(CH₂OCH₃)- group and a -CH(OH)-CH₂- group and a -CH(OCH₃)-CH₂- group,

30

(v.2). when R' is a bridged (C₇-C₁₀)cycloalkyl group, L is a single bond, a -CH₂- group or a -CH(CH₃)- group,

(v.3). when R' is a (C₅-C₈)heterocycloalkyl group including spiro(C₃-C₈)heterocycloalkyls, L is a single bond or a -CH₂- group,

5 (v.4). when R' is a phenyl, L is selected from the group consisting of a single bond, a -CH₂- group, a -CH₂-CH(COOCH₃)- group, a -CH(CH₂F)- group, a -CH(CH₂NH₂)- group, a -CH(CH₂NHCH₃)- group, a -CH(CH₂N(CH₃)₂)- group, a -CH₂-CH(CH₂OH)- group, a -CH(CH₂OH)- group, a -CH(CH₂OCH₃)- group, a -CH(OH)-CH₂- group, a
10 -CH₂-CH(CH₂OCH₃)- group, a -CH₂-CH(OH)-CH₂- group and a -CH₂-CH(OCH₃)-CH₂ group,

(v.5). when R' is a heteroaryl group, L is selected from the group comprising a single bond, a -CH₂- group, a -(CH₂)₃- group and a -(CH₂)₂- group.

15 According to another particular embodiment, the present invention relates to a compound of formula (I) as defined herein above, wherein R¹ represents:

- an adamantyl group, optionally substituted by one to three groups, and in particular substituted by one group, selected from a methyl group, a methoxy group, a hydroxy group, a fluorine atom, a -O-C(O)-CH₃ group, a -O-C(O)-C(CH₃)₃ group, a -O-C(O)-NH-C(CH₃)₃ group, a -NH-C(O)-CH₃ group, a -NH-C(O)-C₃H₄ group, a -S(O)₂-CH₃ group, a -S(O)₂-C₃H₄ group, a -N(CH₃)₂ group and a -C(O)-O-CH₃ group, the adamantyl group being preferably unsubstituted;
20 or
- a R''-O-CH₂(R''')- group, wherein:
 - 25 ○ R'' is a (C₁-C₄)alkyl group, preferably a methyl or ethyl group, and
 - R''' is a (C₁-C₄)alkyl group, in particular a (C₃-C₄)alkyl group, and preferably an isopropylmethyl group, or
 - R''' is a phenyl group, optionally substituted by one to three groups and in particular substituted by one group, selected from the group consisting of a
30 (C₁-C₆)alkyl group, a fluoro(C₁-C₄)alkyl group, a fluoro(C₁-C₄)alkoxy group, a halogen atom and a hydroxy group, the phenyl group being preferably unsubstituted.

According to another particular embodiment, the present invention relates to a compound of formula (I) as defined herein above wherein R^1 represents:

- a (C₁-C₆)alkyl group substituted by one or two groups selected from a -COOR^a group, a hydroxy group, a fluorine atom, a (C₁-C₄)alkoxy group and a benzyloxy group, said benzyloxy group being optionally substituted on its phenyl group by a halogen atom,
 - a spiro(C₅-C₁₁)bicyclic ring, or
 - a R'-L- group, wherein
 - o L is either a single bond or a (C₁-C₃)alkanediyl group, optionally substituted by a group chosen from a hydroxy group and a (C₁-C₃)alkoxy group, and
 - o R' is selected from the group consisting of:
 - a (C₃-C₈)cycloalkyl group, optionally substituted by one, two or three groups selected from a halogen atom, a (C₁-C₄)alkyl group, a hydroxy group and a (C₁-C₃)alkoxy group, and
 - a bridged (C₆-C₁₀)cycloalkyl group, optionally substituted by one to three groups selected from a (C₁-C₄)alkyl group, a (C₁-C₄)alkoxy group, a halogen atom, a hydroxy group, a -O-C(O)-R^d group, a -O-C(O)-NHR^d group and a -NH-C(O)-R^d group, a -SO₂-R^d group, a -N(R^e)₂ group and a -COOR^a group,
- R^a representing a (C₁-C₄)alkyl group, R^d representing a (C₁-C₄)alkyl group or a cyclopropyl group and R^e representing a (C₁-C₃)alkyl group, and wherein R² represents a hydrogen atom or a (C₁-C₃)alkyl group,
- or any of its pharmaceutically acceptable salt.

Said sub-group of compounds are gathered under the "A1" type of compounds within the herein after table 1.

Still according to said embodiment, R¹ may more particularly represent a cyclopropylmethyl, a cyclopropyl, a cyclobutyl, a cyclopentyl, a cyclohexylmethyl, a cyclohexyl, a cycloheptylmethyl, a cycloheptyl, a cyclooctyl, a 3-hydroxy-2,2-dimethylpropyl, a 2-benzyloxyethyl, a 2-methylcyclohexyl, a 1-cyclohexylethyl, a 1-adamantylmethyl, a 1-(1-adamantyl)ethyl, a 1-adamantyl, a 2-adamantyl, a 3,5-dimethyl-1-

adamantyl, a 5-hydroxy-2-adamantyl, a 3-hydroxy-1-adamantyl, a 3-methoxy-1-adamantyl, a 2,6,6-trimethylnorpinan-3-yl, a 6,6-dimethylnorpinan-2-yl, a spiro[2.5]octan-2-yl, a spiro[3.3]heptan-2-yl, a 1,7,7-trimethylnorbornan-2-yl, norbornan-2-yl, a 2-isopropyl-5-methyl-cyclohexyl, a 1-(cyclohexylmethyl)-2-hydroxy-ethyl, a 1-(cyclopentylmethyl)-2-hydroxy-ethyl, a 1-(cyclobutylmethyl)-2-hydroxy-ethyl, a 1-(cyclopropylmethyl)-2-hydroxy-ethyl, a 1-(hydroxymethyl)-3-methyl-butyl, a 1-(methoxymethyl)-3-methyl-butyl, a 1-(hydroxymethyl)propyl, a 1-(fluoromethyl)-3-methyl-butyl, a 1-cyclohexyl-2-hydroxy-ethyl, a 1-cyclohexyl-2-methoxy-ethyl, a 2-cyclohexyl-2-hydroxy-ethyl, a 2-cyclohexyl-2-methoxy-ethyl, a 2-hydroxycyclopentyl, a 2-methoxycyclopentyl, a 2-hydroxycyclohexyl, a 3-hydroxycyclohexyl, a 4-hydroxycyclohexyl, a 2-methoxycyclohexyl, a 4-methoxycyclohexyl, a 2-hydroxycycloheptyl, a 3-hydroxycycloheptyl, a 2-methoxycycloheptyl, a -CH(COOCH₃)-CH(CH₃)₂, a -CH(COOCH₃)-CH₃, a -CH(COOCH₃)-CH₂-CH(CH₃)₂, a -CH(COOCH₃)-CHOH-CH₃, a 3,3-difluorocyclopentyl, a 4,4-difluorocyclohexyl, a 3,3-difluorocyclohexyl, a 2,2-difluorocyclohexyl, a 3,3-difluorocycloheptyl, a 3-acetoxy-1-adamantyl, a 3-pivaloyloxy-1-adamantyl, a 3-methoxycyclohexyl, a 4-hydroxycycloheptyl, a 3-methoxycycloheptyl, a 3-methoxycycloheptyl, a 4-methoxycycloheptyl, a 3-noradamantyl, 3-*tert*-butylcarbamoxyloxy-1-adamantyl, 3-fluoro-1-adamantyl, 1-(*tert*-butoxymethyl)-3-methyl-butyl, 3-acetamido-1-adamantyl, 3-(cyclopropanecarbonylamino)-1-adamantyl, a 3-(methanesulfonamido)-1-adamantyl, a 3-(cyclopropylsulfonylamino)-1-adamantyl, a 3-(dimethylamino)-1-adamantyl, a 2-methoxycarbonyl-2-adamantyl, a 3,5-dihydroxy-1-adamantyl, a 3,5,7-trifluoro-1-adamantyl, a 1-(ethoxymethyl)-3-methyl-butyl, a 1-(benzyloxymethyl)-3-methyl-butyl, a 1-[(4-fluorophenyl)methoxymethyl]-3-methyl-butyl or a 1-(cyclopropoxymethyl)-3-methyl-butyl.

25

According to another particular embodiment, the present invention relates to a compound of formula (I) as defined herein above wherein R¹ represents:

- a fused phenyl group, chosen from phenyl groups fused with a (C₅-C₆)cycloalkyl or (C₅-C₆)heterocycloalkyl, which (C₅-C₆)cycloalkyl and (C₅-C₆)heterocycloalkyl group optionally comprise an insaturation and is optionally substituted by a (C₁-C₄) alkyl group, a hydroxy group, a halogen atom, a (C₁-C₃)alkoxy group and a -COR^a group,

30

- a phenyl group, substituted by one or two groups selected from (C₁-C₈)alkyl, a (C₁-C₃)fluoroalkyl, a fluoro(C₁-C₄)alkoxy group, a halogen atom, and a (C₄-C₇)heterocycloalkyl group, said (C₄-C₇)heterocycloalkyl group being itself optionally substituted by a (C₁-C₄) alkyl group, or
- 5 - a R'-L- group, wherein
 - L is a (C₁-C₃)alkanediyl group, optionally substituted by a group chosen from a hydroxy group, a (C₁-C₄)alkoxy group, a -NR^bR^c group, a -COOR^a group and a halogen atom, and
 - R' is a phenyl group, optionally substituted by one to three groups
- 10 selected from the group consisting of (C₁-C₆)alkyl group, a fluoro(C₁-C₄)alkyl group and a fluoro(C₁-C₄)alkoxy group, a halogen atom and a hydroxy group,

wherein R^a is a (C₁-C₄)alkyl or a hydrogen atom and R^b and R^c are independently chosen from (C₁-C₆)alkyl and a hydrogen atom, and
- 15 wherein R² represents a hydrogen atom or a (C₁-C₃)alkyl group,

or any pharmaceutically acceptable salt thereof.

Said sub-group of compounds are gathered under the "A2" and "A5" type of compounds within the herein after table 1.

- Still according to said embodiment, R¹ may more particularly represent a
- 20 benzyl, an indan-2-yl, a (3,4-dimethylphenyl)methyl, a (2,4-dimethylphenyl)methyl, a [2-(trifluoromethyl)phenyl]methyl, a [2-(trifluoromethoxy)phenyl]methyl, a 2-hydroxyindan-1-yl, a 2-methoxyindan-1-yl, a -CH(COOCH₃)-CH₂-Ph, a -CH(CH₂F)Ph, a 2-amino-1-phenyl-ethyl, a 2-(methylamino)-1-phenyl-ethyl, a 2-(dimethylamino)-1-phenyl-ethyl, a 1-benzyl-2-hydroxy-ethyl, a 1-benzyl-2-methoxy-ethyl, a 2-hydroxy-1-phenyl-ethyl, a 2-
 - 25 methoxy-1-phenyl-ethyl, a 2-hydroxy-2-phenyl-ethyl, a 2-methoxy-2-phenyl-ethyl, a 2-hydroxy-3-phenyl-propyl, a 2-methoxy-3-phenyl-propyl, a 3-fluoro-4-methyl-phenyl, a 4-fluorophenyl, a 4-*n*-hexylphenyl, a 4-(4-methylpiperazin-1-yl)phenyl, a 3-(difluoromethoxy)phenyl, a 1-acetylindolin-6-yl, a 3-(trifluoromethyl)phenyl, an indan-5-yl, a 4-morpholinophenyl, a 1-methylindazol-7-yl or a 2-*tert*-butoxy-1-phenyl-ethyl.

30

According to another particular embodiment, the present invention relates to a compound of formula (I) as defined herein above wherein R² represents a hydrogen atom or a methyl group.

5 According to another particular embodiment, the present invention relates to a compound of formula (I) as defined herein above wherein R¹ represents a R'-L- group wherein:

- R' is a (C₃-C₈)heteroaryl group, optionally substituted by one to three groups selected from a halogen atom, a (C₁-C₄)alkyl group, a (C₁-C₄)alkoxy group and a
10 *N*-methylpiperazinyl group, and
- L is a (C₁-C₃)alkanediyl or a single bond, and

wherein R² represents a hydrogen atom,
or any pharmaceutically acceptable salt thereof.

Said sub-group of compounds are gathered under the "A3" and "A6" type of
15 compounds within the herein after table 1.

Still according to said embodiment, R¹ may more particularly represent a (5-methylpyrazin-2-yl)methyl, a 2-pyridylmethyl, a 3-pyridylmethyl, a 4-pyridylmethyl, a (5-methyl-2-furyl)methyl, a (4-methylthiazol-2-yl)methyl, a 3-imidazol-1-ylpropyl, a 2-(2-pyridyl)ethyl, a 1,3-benzothiazol-2-ylmethyl, a 2-pyrimidinyl, a 2-pyridyl, a 1-
20 methylpyrazol-3-yl, a 2-methoxy-6-methyl-3-pyridyl, a pyrimidin-5-yl, 3-pyridyl, a 1,3,4-thiadiazol-2-yl, a 5-(4-methylpiperazin-1-yl)-2-pyridyl, 6-(4-methylpiperazin-1-yl)-3-pyridyl, a 2-(4-methylpiperazin-1-yl)pyrimidin-5-yl, a 5-(4-methylpiperazin-1-yl)pyrimidin-2-yl, a 5-(4-methylpiperazin-1-yl)pyrazin-2-yl or a 6-(4-methylpiperazin-1-yl)pyridazin-3-yl.

25 According to another particular embodiment, the present invention relates to a compound of formula (I) as defined herein above wherein R¹ represents a R'-L- group wherein:

- R' is a (C₃-C₅)heterocycloalkyl group, optionally substituted by one to three
30 groups selected from a hydroxyl group, a (C₁-C₄)alkyl group, an oxo group and a -COOR^a group wherein R^a is as defined herein above, and
- L is a methylene or a single bond, and

wherein R² represents a hydrogen atom,
or any pharmaceutically acceptable salt thereof.

Said sub-group of compounds are gathered under the “A4” and “A7” type of compounds within the herein after table 1.

5 Still according to said embodiment, R¹ may more particularly represent a (1-methyl-4-piperidyl)methyl, a tetrahydropyran-4-yl-methyl, a 1-*tert*-butyloxycarbonylpiperidin-4-yl-methyl, a 7-methyl-7-azaspiro[3.5]nonan-2-yl, a tetrahydropyran-4-yl, a 1-*tert*-butyloxycarbonylpiperidin-4-yl, a 1-ethyloxycarbonylpiperidin-4-yl, a 1-methyl-4-piperidyl, a 1-methyl-3-piperidyl, an oxetan-
10 3-yl, tetrahydrofuran-3-yl, a tetrahydropyran-3-yl, a 6,6-dimethyltetrahydropyran-3-yl, a 4-hydroxytetrahydropyran-3-yl, an oxepan-3-yl, a 2-oxo-piperidin-3-yl, a 2-oxo-piperidin-5-yl, a quinuclidin-3-yl, a tetrahydrothiopyran-3-yl, a 1,4-dioxepan-6-yl, a 2-oxo-pyrrolidin-3-yl, a 1-methyl-2-oxo-pyrrolidin-3-yl, a 4,4-dimethyl-2-oxo-pyrrolidin-3-yl, a 1-methyl-2-oxo-piperidin-3-yl, a 3-methyl-2-oxo-pyrrolidin-3-yl or a 1,3-dimethyl-2-oxo-pyrrolidin-3-yl.
15 yl.

In the context of the present invention, the term:

- “halogen” is understood to mean chlorine, fluorine, bromine, or iodine, and in particular denotes chlorine, fluorine or bromine,

20 - “(C₁-C_x)alkyl”, as used herein, respectively refers to a C₁-C_x normal, secondary or tertiary monovalent saturated hydrocarbon radical, for example (C₁-C₆)alkyl. Examples are, but are not limited to, methyl, ethyl, propyl, *n*-propyl, isopropyl, butyl, isobutyl, *sec*-butyl, *tert*-butyl, pentyl, isopentyl, hexyl and isohexyl groups, and the like.

- “(C₁-C₃)alkanediyl”, as used herein, refers to a divalent saturated hydrocarbon
25 radical which is branched or linear, comprises from 1 to 3 carbon atoms, and more particularly a methylene, ethylene or propylene, such as linear propylene or isopropylene, said alkanediyl may be substituted as it is apparent from the following description.

- “(C₃-C₈)cycloalkyl”, as used herein, refers to a cyclic saturated hydrocarbon, from 3 to 8 carbon atoms, saturated or partially unsaturated and unsubstituted or
30 substituted. Examples are, but are not limited to, cyclopropyl, cyclobutyl, cyclopentyl, cyclohexyl, cycloheptyl and cyclooctyl.

- “(C₃-C₈)heterocycloalkyl group”, as used herein, refers to a (C₃-C₈)cycloalkyl group wherein one or two of the carbon atoms are replaced with a heteroatom such as oxygen, nitrogen or sulphur, and more particularly such as an oxygen or a nitrogen atom. Such heterocycloalkyl group may be saturated or partially saturated and unsubstituted or substituted. Examples are, but are not limited to, morpholinyl, piperazinyl, piperidinyl, pyrrolidinyl, aziridinyl, oxanyl, oxetanyl, tetrahydropyranyl, morpholinyl, tetrahydrofuranyl, oxepanyl, diazepanyl, dioxanyl and tetrahydrothiopyranyl, and more particularly piperidinyl and piperazinyl, and even more particularly piperazinyl.

- “(C₁-C_x)alkoxy”, as used herein, refers to a -O-(C₁-C_x)alkyl or -O-(C₃-C_x)cycloalkyl moiety, wherein alkyl and cycloalkyl are as defined above, for example (C₁-C₆)alkoxy. Examples are, but are not limited to, methoxy, ethoxy, 1-propoxy, 2-propoxy, cyclopropoxy, butoxy, *tert*-butoxy and pentoxy.

- “spiro(C₅-C₁₁)bicyclic ring” refers to two rings connected through a defining single common atom. Such spiro bicyclic alkyl generally comprises 5 to 11 carbon atoms referring to a “spiro(C₅-C₁₁)bicyclic alkyl group”. In a particular embodiment, one or more carbon atoms of the rings are replaced by heteroatom(s) such as oxygen, nitrogen or sulphur, and more particularly such as a nitrogen atom, forming a spiro(C₅-C₁₁)bicyclic heteroalkyl group. Such spirobicyclic ring may be unsubstituted or substituted, in particular by at least one (C₁-C₃)alkyl group such as methyl. Examples are, but are not limited to spiro[3.3]heptanyl, spiro[2.5]octanyl, 7-azaspiro[3.5]nonanyl.

- a “bridged (C₆-C₁₀)cycloalkyl” group, as used herein, refers to a bi- or tricyclic compound where the cycles are cycloalkyls, the rings share three or more atoms and the bridge contains at least one atom, for example 1, 2 or 3 atoms. Such bridged cycloalkyl groups may be substituted by one or more C₁-C₃ alkyl. Examples are, but not limited to adamantyl, 2,6,6-trimethylbicyclo[3.1.1]heptyl, 6,6-dimethylbicyclo[3.1.1]heptyl, bicyclo[3.1.1]heptyl, 1,6,6-trimethylbicyclo[3.1.1]heptyl.

- a “bridged (C₆-C₁₀)heterocycloalkyl” group, as used herein, refers to a bridged (C₆-C₁₀)cycloalkyl as defined herein above wherein one or more carbon atoms of the rings are replaced by heteroatom(s) such as oxygen, nitrogen or sulphur, and more particularly such as a nitrogen atom. Examples are, but not limited to quinuclidin-3-yl.

- a “fused phenyl group” refers to a bicyclic radical that contains a phenyl moiety and may be substituted. Said fused phenyl group may be fused to a cycloalkyl or to

a heterocycloalkyl and bound to the rest of the molecule either by its phenyl moiety or by said cycloalkyl or heterocycloalkyl. Examples are, but are not limited to indanyl, acetylidolyl, methylindazolyl, hydroxyindanyl, benzothiazolyl, indolyl, indazolyl, methoxyindanyl and the like.

- 5 - a (C₅-C₁₁)heteroaryl group, as used herein, refers to a monocyclic aromatic group or to a bicyclic aromatic group where at least one of the ring is aromatic and wherein one to three ring carbon atom is replaced by a heteroatom, such as nitrogen, oxygen or sulphur. By way of examples of heteroaryl groups, mention may be made of, but not limited to: oxazole, isoxazole, pyridine, pyrimidine, pyridazine, triazine, pyrazine, 10 oxadiazole, furane, pyrazole, thiazole, isothiazole, thiadiazole, imidazole, triazole and the like. In the framework of the present invention, the heteroaryl is advantageously pyridine, imidazole, pyrazine, furane, thiazole, pyrazole, thiadiazole, pyridazine and pyrimidine.

 - an aromatic ring means, according to Hückel's rule, that a molecule has $4n + 2$ π -electrons.

- 15 - a (C₁-C_x)fluoroalkyl group, as used herein, refers to a (C₁-C_x)alkyl as defined herein above in which one or more fluorines have been substituted by hydrogen. In one embodiment all the hydrogen atoms are replaced by fluor atoms, forming perfluoroalkyl groups, such as trifluoromethyl.

- a (C₁-C_x)fluoroalkoxy, as used herein, refers to a (C₁-C_x)alkoxy as defined 20 herein above in which one or more fluorines have been substituted for hydrogen such as trifluoromethoxy. In one embodiment all the hydrogen atoms are replaced by fluor atoms, forming perfluoroalkoxy groups, such as trifluoromethoxy.

In the context of the present invention, the terms "aromatic ring", and "heteroaryl" include all the positional isomers.

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- The nomenclature of the following compounds (1) to (216) was generated according to the principles of the International Union of Pure and Applied Chemistry, using Accelrys Draw 4.1 SP1. To avoid any confusion, the "(±)" symbol added to designate a racemic mixture; "cis" and "trans" prefixes were also used to assign the 30 relative stereochemistry of two adjacent chiral centers.

According to a preferred embodiment of the present invention, the compound of formula (I) is chosen from:

- (1). (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-(cyclopropylmethylamino)-1H-imidazol-5-one,
- (2). (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-(cyclopropylamino)-1H-imidazol-5-one,
- 5 (3). (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-(cyclobutylamino)-1H-imidazol-5-one,
- (4). (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-(cyclopentylamino)-1H-imidazol-5-one,
- (5). (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-(cyclohexylmethylamino)-1H-imidazol-5-one,
- 10 (6). (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-(cyclohexylamino)-1H-imidazol-5-one,
- (7). (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-(cycloheptylmethylamino)-1H-imidazol-5-one,
- 15 (8). (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-(cycloheptylamino)-1H-imidazol-5-one,
- (9). (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-(cyclooctylamino)-1H-imidazol-5-one,
- (10). (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(3-hydroxy-2,2-dimethylpropyl)amino]-1H-imidazol-5-one,
- 20 (11). (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-(2-benzyloxyethylamino)-1H-imidazol-5-one,
- (12). (±)-(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[cis-2-methylcyclohexyl]amino]-1H-imidazol-5-one,
- 25 (13). (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(1R)-1-cyclohexylethyl]amino]-1H-imidazol-5-one,
- (14). (4Z)-2-(1-Adamantylmethylamino)-4-(1,3-benzothiazol-6-ylmethylene)-1H-imidazol-5-one,
- (15). (±)-(4Z)-2-[1-(1-Adamantyl)ethylamino]-4-(1,3-benzothiazol-6-ylmethylene)-1H-imidazol-5-one,
- 30 (16). (4Z)-2-(1-Adamantylamino)-4-(1,3-benzothiazol-6-ylmethylene)-1H-imidazol-5-one,

- (17). (4Z)-2-(2-Adamantylamino)-4-(1,3-benzothiazol-6-ylmethylene)-1*H*-imidazol-5-one,
- (18). (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[3,5-dimethyl-1-adamantyl]amino]-1*H*-imidazol-5-one,
- 5 (19). (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(*trans*-5-hydroxy-2-adamantyl)amino]-1*H*-imidazol-5-one,
- (20). (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(3-hydroxy-1-adamantyl)amino]-1*H*-imidazol-5-one,
- (21). (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(3-methoxy-1-adamantyl)amino]-1*H*-imidazol-5-one,
- 10 (22). (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[*(1R,2R,3R,5S)*-2,6,6-trimethylnorpinan-3-yl]amino]-1*H*-imidazol-5-one,
- (23). (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[*(1S,2S,3S,5R)*-2,6,6-trimethylnorpinan-3-yl]amino]-1*H*-imidazol-5-one,
- 15 (24). (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[*(1R,2R,5R)*-6,6-dimethylnorpinan-2-yl]methylamino]-1*H*-imidazol-5-one,
- (25). (±)-(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-(spiro[2.5]octan-2-ylamino)-1*H*-imidazol-5-one,
- (26). (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-(spiro[3.3]heptan-2-ylamino)-1*H*-imidazol-5-one,
- 20 (27). (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[*(2R)*-1,7,7-trimethylnorbornan-2-yl]amino]-1*H*-imidazol-5-one,
- (28). (±)-(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-(norbornan-2-ylamino)-1*H*-imidazol-5-one,
- 25 (29). (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[*(1R,2S,5R)*-2-isopropyl-5-methyl-cyclohexyl]amino]-1*H*-imidazol-5-one,
- (30). (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[*(1R)*-1-(cyclohexylmethyl)-2-hydroxy-ethyl]amino]-1*H*-imidazol-5-one,
- (31). (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[*(1R)*-1-(cyclopentylmethyl)-2-hydroxy-ethyl]amino]-1*H*-imidazol-5-one,
- 30 (32). (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[*(1R)*-1-(cyclobutylmethyl)-2-hydroxy-ethyl]amino]-1*H*-imidazol-5-one,

- (33). (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[1*R*)-1-(cyclopropylmethyl)-2-hydroxy-ethyl]amino]-1*H*-imidazol-5-one,
- (34). (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[1*R*)-1-(hydroxymethyl)-3-methyl-butyl]amino]-1*H*-imidazol-5-one,
- 5 (35). (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[1*R*)-1-(methoxymethyl)-3-methyl-butyl]amino]-1*H*-imidazol-5-one,
- (36). (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[1*S*)-1-(hydroxymethyl)-3-methyl-butyl]amino]-1*H*-imidazol-5-one,
- (37). (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[1*S*)-1-(methoxymethyl)-3-methyl-butyl]amino]-1*H*-imidazol-5-one,
- 10 (38). (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[1*R*)-1-(hydroxymethyl)propyl]amino]-1*H*-imidazol-5-one,
- (39). (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[1*S*)-1-(hydroxymethyl)propyl]amino]-1*H*-imidazol-5-one,
- 15 (40). (±)-(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[1-(fluoromethyl)-3-methyl-butyl]amino]-1*H*-imidazol-5-one,
- (41). (±)-(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(1-cyclohexyl-2-hydroxy-ethyl)amino]-1*H*-imidazol-5-one,
- (42). (±)-(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(1-cyclohexyl-2-methoxy-ethyl)amino]-1*H*-imidazol-5-one,
- 20 (43). (±)-(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(2-cyclohexyl-2-hydroxy-ethyl)amino]-1*H*-imidazol-5-one,
- (44). (±)-(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(2-cyclohexyl-2-methoxy-ethyl)amino]-1*H*-imidazol-5-one,
- 25 (45). (±)-(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[*cis*-2-hydroxycyclopentyl]amino]-1*H*-imidazol-5-one,
- (46). (±)-(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[*trans*-2-hydroxycyclopentyl]amino]-1*H*-imidazol-5-one,
- (47). (±)-(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[*cis*-2-methoxycyclopentyl]amino]-1*H*-imidazol-5-one,
- 30 (48). (±)-(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[*trans*-2-methoxycyclopentyl]amino]-1*H*-imidazol-5-one,

- (49). (±)-(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[*cis*-2-hydroxycyclohexyl]amino]-1*H*-imidazol-5-one,
- (50). (±)-(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[*trans*-2-hydroxycyclohexyl]amino]-1*H*-imidazol-5-one,
- 5 (51). (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[(1*R*,2*S*)-2-hydroxycyclohexyl]amino]-1*H*-imidazol-5-one,
- (52). (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[(1*S*,2*R*)-2-hydroxycyclohexyl]amino]-1*H*-imidazol-5-one,
- (53). (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[(1*R*,2*R*)-2-hydroxycyclohexyl]amino]-1*H*-imidazol-5-one,
- 10 (54). (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[(1*S*,2*S*)-2-hydroxycyclohexyl]amino]-1*H*-imidazol-5-one,
- (55). (±)-(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[*cis*-3-hydroxycyclohexyl]amino]-1*H*-imidazol-5-one,
- 15 (56). (±)-(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[*trans*-3-hydroxycyclohexyl]amino]-1*H*-imidazol-5-one,
- (57). (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(*trans*-4-hydroxycyclohexyl)amino]-1*H*-imidazol-5-one,
- (58). (±)-(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[*cis*-2-methoxycyclohexyl]amino]-1*H*-imidazol-5-one,
- 20 (59). (±)-(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[*trans*-2-methoxycyclohexyl]amino]-1*H*-imidazol-5-one,
- (60). (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(*trans*-4-methoxycyclohexyl)amino]-1*H*-imidazol-5-one,
- 25 (61). (±)-(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[*cis*-2-hydroxycycloheptyl]amino]-1*H*-imidazol-5-one,
- (62). (±)-(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[*trans*-2-hydroxycycloheptyl]amino]-1*H*-imidazol-5-one,
- (63). (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[(1*R*,2*R*)-2-hydroxycycloheptyl]amino]-1*H*-imidazol-5-one,
- 30 (64). (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[(1*S*,2*S*)-2-hydroxycycloheptyl]amino]-1*H*-imidazol-5-one,

- (65). (±)-(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[*cis*-3-hydroxycycloheptyl]amino]-1*H*-imidazol-5-one,
- (66). (±)-(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[*trans*-3-hydroxycycloheptyl]amino]-1*H*-imidazol-5-one,
- 5 (67). (±)-(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[*cis*-2-methoxycycloheptyl]amino]-1*H*-imidazol-5-one,
- (68). (±)-(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[*trans*-2-methoxycycloheptyl]amino]-1*H*-imidazol-5-one,
- (69). Methyl (2*S*)-2-[[4*Z*]-4-(1,3-benzothiazol-6-ylmethylene)-5-oxo-1*H*-imidazol-2-yl]amino]-3-methyl-butanoate,
- 10 (70). Methyl (2*S*)-2-[[4*Z*]-4-(1,3-benzothiazol-6-ylmethylene)-5-oxo-1*H*-imidazol-2-yl]amino]propanoate,
- (71). Methyl (2*S*)-2-[[4*Z*]-4-(1,3-benzothiazol-6-ylmethylene)-5-oxo-1*H*-imidazol-2-yl]amino]-4-methyl-pentanoate,
- 15 (72). Methyl (2*R*)-2-[[4*Z*]-4-(1,3-benzothiazol-6-ylmethylene)-5-oxo-1*H*-imidazol-2-yl]amino]-4-methyl-pentanoate,
- (73). Methyl (2*S*)-2-[[4*Z*]-4-(1,3-benzothiazol-6-ylmethylene)-5-oxo-1*H*-imidazol-2-yl]amino]-3-hydroxy-butanoate,
- (74). (4*Z*)-4-(1,3-Benzothiazol-6-ylmethylene)-2-(benzylamino)-1*H*-imidazol-5-one,
- 20 (75). (4*Z*)-4-(1,3-Benzothiazol-6-ylmethylene)-2-(indan-2-ylamino)-1*H*-imidazol-5-one,
- (76). (4*Z*)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(3,4-dimethylphenyl)methylamino]-1*H*-imidazol-5-one,
- 25 (77). (4*Z*)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(2,4-dimethylphenyl)methylamino]-1*H*-imidazol-5-one,
- (78). (4*Z*)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[2-(trifluoromethyl)phenyl]methylamino]-1*H*-imidazol-5-one,
- (79). (4*Z*)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[2-(trifluoromethoxy)phenyl]methylamino]-1*H*-imidazol-5-one,
- 30 (80). (±)-(4*Z*)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[*cis*-2-hydroxyindan-1-yl]amino]-1*H*-imidazol-5-one,

- (81). (±)-(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[*trans*-2-hydroxyindan-1-yl]amino]-1*H*-imidazol-5-one,
- (82). (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[*(1R,2R)*-2-hydroxyindan-1-yl]amino]-1*H*-imidazol-5-one,
- 5 (83). (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[*(1S,2S)*-2-hydroxyindan-1-yl]amino]-1*H*-imidazol-5-one,
- (84). (±)-(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[*cis*-2-methoxyindan-1-yl]amino]-1*H*-imidazol-5-one,
- (85). (±)-(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[*trans*-2-methoxyindan-1-yl]amino]-1*H*-imidazol-5-one,
- 10 (86). Methyl (2*S*)-2-[[*(4Z)*-4-(1,3-benzothiazol-6-ylmethylene)-5-oxo-1*H*-imidazol-2-yl]amino]-3-phenyl-propanoate,
- (87). Methyl (2*R*)-2-[[*(4Z)*-4-(1,3-benzothiazol-6-ylmethylene)-5-oxo-1*H*-imidazol-2-yl]amino]-3-phenyl-propanoate,
- 15 (88). (±)-(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(2-fluoro-1-phenyl-ethyl)amino]-1*H*-imidazol-5-one,
- (89). (±)-(4Z)-2-[(2-Amino-1-phenyl-ethyl)amino]-4-(1,3-benzothiazol-6-ylmethylene)-1*H*-imidazol-5-one dihydrochloride,
- (90). (±)-(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[2-(methylamino)-1-phenyl-ethyl]amino]-1*H*-imidazol-5-one dihydrochloride,
- 20 (91). (±)-(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[2-(dimethylamino)-1-phenyl-ethyl]amino]-1*H*-imidazol-5-one,
- (92). (±)-(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(1-benzyl-2-hydroxy-ethyl)amino]-1*H*-imidazol-5-one,
- 25 (93). (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[*(1R)*-1-benzyl-2-hydroxy-ethyl]amino]-1*H*-imidazol-5-one,
- (94). (±)-(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(1-benzyl-2-methoxy-ethyl)amino]-1*H*-imidazol-5-one,
- (95). (±)-(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(2-hydroxy-1-phenyl-ethyl)amino]-1*H*-imidazol-5-one,
- 30 (96). (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[*(1R)*-2-hydroxy-1-phenyl-ethyl]amino]-1*H*-imidazol-5-one,

- (97). (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(1S)-2-hydroxy-1-phenyl-ethyl]amino]-1*H*-imidazol-5-one,
- (98). (±)-(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(2-methoxy-1-phenyl-ethyl)amino]-1*H*-imidazol-5-one,
- 5 (99). (±)-(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(2-hydroxy-2-phenyl-ethyl)amino]-1*H*-imidazol-5-one,
- (100). (±)-(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(2-methoxy-2-phenyl-ethyl)amino]-1*H*-imidazol-5-one,
- (101). (±)-(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(2-hydroxy-3-phenyl-propyl)amino]-1*H*-imidazol-5-one,
- 10 (102). (±)-(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(2-methoxy-3-phenyl-propyl)amino]-1*H*-imidazol-5-one,
- (103). (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(5-methylpyrazin-2-yl)methylamino]-1*H*-imidazol-5-one,
- 15 (104). (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-(2-pyridylmethylamino)-1*H*-imidazol-5-one,
- (105). (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-(3-pyridylmethylamino)-1*H*-imidazol-5-one,
- (106). (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-(4-pyridylmethylamino)-1*H*-imidazol-5-one,
- 20 (107). (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(5-methyl-2-furyl)methylamino]-1*H*-imidazol-5-one,
- (108). (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(4-methylthiazol-2-yl)methylamino]-1*H*-imidazol-5-one,
- 25 (109). (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-(3-imidazol-1-ylpropylamino)-1*H*-imidazol-5-one,
- (110). (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[2-(2-pyridyl)ethylamino]-1*H*-imidazol-5-one,
- (111). (4Z)-2-(1,3-Benzothiazol-2-ylmethylamino)-4-(1,3-benzothiazol-6-ylmethylene)-1*H*-imidazol-5-one,
- 30 (112). (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(1-methyl-4-piperidyl)methylamino]-1*H*-imidazol-5-one,

- (113). (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-(tetrahydropyran-4-ylmethylamino)-1*H*-imidazol-5-one,
- (114). *Tert*-butyl 4-[[[(4Z)-4-(1,3-benzothiazol-6-ylmethylene)-5-oxo-1*H*-imidazol-2-yl]amino]methyl]piperidine-1-carboxylate,
- 5 (115). (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(7-methyl-7-azaspiro[3.5]nonan-2-yl)amino]-1*H*-imidazol-5-one,
- (116). (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-(3-fluoro-4-methyl-anilino)-1*H*-imidazol-5-one,
- 10 (117). (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-(4-fluoroanilino)-1*H*-imidazol-5-one,
- (118). (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-(4-hexylanilino)-1*H*-imidazol-5-one,
- (119). (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[4-(4-methylpiperazin-1-yl)anilino]-1*H*-imidazol-5-one,
- 15 (120). (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[3-(difluoromethoxy)anilino]-1*H*-imidazol-5-one,
- (121). (4Z)-2-[(1-Acetylinolin-6-yl)amino]-4-(1,3-benzothiazol-6-ylmethylene)-1*H*-imidazol-5-one,
- (122). (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[3-(trifluoromethyl)anilino]-1*H*-imidazol-5-one,
- 20 (123). (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-(indan-5-ylamino)-1*H*-imidazol-5-one,
- (124). (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-(4-morpholinoanilino)-1*H*-imidazol-5-one,
- 25 (125). (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(1-methylindazol-7-yl)amino]-1*H*-imidazol-5-one,
- (126). (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-(pyrimidin-2-ylamino)-1*H*-imidazol-5-one,
- (127). (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-(2-pyridylamino)-1*H*-imidazol-5-one,
- 30 (128). (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(1-methylpyrazol-3-yl)amino]-1*H*-imidazol-5-one,

- (129). (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(2-methoxy-6-methyl-3-pyridyl)amino]-1*H*-imidazol-5-one,
- (130). (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-(pyrimidin-5-ylamino)-1*H*-imidazol-5-one,
- 5 (131). (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-(3-pyridylamino)-1*H*-imidazol-5-one,
- (132). (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-(1,3,4-thiadiazol-2-ylamino)-1*H*-imidazol-5-one,
- (133). (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[5-(4-methylpiperazin-1-yl)-2-pyridyl]amino]-1*H*-imidazol-5-one,
- 10 (134). (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[6-(4-methylpiperazin-1-yl)-3-pyridyl]amino]-1*H*-imidazol-5-one,
- (135). (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[2-(4-methylpiperazin-1-yl)pyrimidin-5-yl]amino]-1*H*-imidazol-5-one,
- 15 (136). (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[5-(4-methylpiperazin-1-yl)pyrimidin-2-yl]amino]-1*H*-imidazol-5-one,
- (137). (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[5-(4-methylpiperazin-1-yl)pyrazin-2-yl]amino]-1*H*-imidazol-5-one,
- (138). (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[6-(4-methylpiperazin-1-yl)pyridazin-3-yl]amino]-1*H*-imidazol-5-one,
- 20 (139). (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-(tetrahydropyran-4-ylamino)-1*H*-imidazol-5-one,
- (140). *Tert*-butyl 4-[[4-(4Z)-4-(1,3-benzothiazol-6-ylmethylene)-5-oxo-1*H*-imidazol-2-yl]amino]piperidine-1-carboxylate,
- 25 (141). Ethyl 4-[[4-(4Z)-4-(1,3-benzothiazol-6-ylmethylene)-5-oxo-1*H*-imidazol-2-yl]amino]piperidine-1-carboxylate,
- (142). (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(1-methyl-4-piperidyl)amino]-1*H*-imidazol-5-one,
- (143). (±)-(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(1-methyl-3-piperidyl)amino]-1*H*-imidazol-5-one,
- 30 (144). (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-(oxetan-3-ylamino)-1*H*-imidazol-5-one,

- (145). (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(3R)-tetrahydrofuran-3-yl]amino]-1H-imidazol-5-one,
- (146). (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(3S)-tetrahydrofuran-3-yl]amino]-1H-imidazol-5-one,
- 5 (147). (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(3R)-tetrahydropyran-3-yl]amino]-1H-imidazol-5-one,
- (148). (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(3S)-tetrahydropyran-3-yl]amino]-1H-imidazol-5-one,
- (149). (±)-(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(6,6-
- 10 dimethyltetrahydropyran-3-yl)amino]-1H-imidazol-5-one,
- (149A). (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(3R)/(3S)-6,6-dimethyltetrahydropyran-3-yl]amino]-1H-imidazol-5-one,
- (149B). (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(3R)/(3S)-6,6-dimethyltetrahydropyran-3-yl]amino]-1H-imidazol-5-one,
- 15 (150). (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(3R,4R)-4-hydroxytetrahydropyran-3-yl]amino]-1H-imidazol-5-one,
- (151). (±)-(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-(oxepan-3-ylamino)-1H-imidazol-5-one,
- (152). (±)-3-[(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-5-oxo-1H-imidazol-2-
- 20 yl]amino]piperidin-2-one,
- (153). (3S)-3-[(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-5-oxo-1H-imidazol-2-yl]amino]piperidin-2-one,
- (154). (5S)-5-[(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-5-oxo-1H-imidazol-2-yl]amino]piperidin-2-one,
- 25 (155). (±)-(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(3,3-difluorocyclopentyl)amino]-1H-imidazol-5-one,
- (156). (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(4,4-difluorocyclohexyl)amino]-1H-imidazol-5-one,
- (157). (±)-(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(3,3-
- 30 difluorocyclohexyl)amino]-1H-imidazol-5-one,
- (158). (±)-(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(2,2-difluorocyclohexyl)amino]-1H-imidazol-5-one,

- (159). (±)-(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(3,3-difluorocycloheptyl)amino]-1*H*-imidazol-5-one,
- (160). (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(1*R*)-1-(fluoromethyl)-3-methyl-butyl]amino]-1*H*-imidazol-5-one,
- 5 (161). (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(1*S*)-1-(fluoromethyl)-3-methyl-butyl]amino]-1*H*-imidazol-5-one,
- (162). [3-[(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-5-oxo-1*H*-imidazol-2-yl]amino]-1-adamantyl] acetate,
- (163). [3-[(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-5-oxo-1*H*-imidazol-2-yl]amino]-1-adamantyl] 2,2-dimethylpropanoate,
- 10 (164). (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(1*R*,2*R*)-2-methoxycyclopentyl]amino]-1*H*-imidazol-5-one,
- (165). (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(1*S*,2*S*)-2-methoxycyclopentyl]amino]-1*H*-imidazol-5-one,
- 15 (166). (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(1*R*,2*R*)-2-methoxycyclohexyl]amino]-1*H*-imidazol-5-one,
- (167). (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(1*S*,2*S*)-2-methoxycyclohexyl]amino]-1*H*-imidazol-5-one,
- (168). (±)-(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[*cis*-3-methoxycyclohexyl]amino]-1*H*-imidazol-5-one,
- 20 (169). (±)-(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[*trans*-3-methoxycyclohexyl]amino]-1*H*-imidazol-5-one,
- (169A).(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(1*R*,3*R*)/(1*S*,3*S*)-3-methoxycyclohexyl]amino]-1*H*-imidazol-5-one,
- 25 (169B).(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(1*R*,3*R*)/(1*S*,3*S*)-3-methoxycyclohexyl]amino]-1*H*-imidazol-5-one,
- (170). (±)-(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[*cis*-4-hydroxycycloheptyl]amino]-1*H*-imidazol-5-one,
- (171). (±)-(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[*trans*-4-hydroxycycloheptyl]amino]-1*H*-imidazol-5-one,
- 30 (171A).(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(1*R*,4*R*)/(1*S*,4*S*)-4-hydroxycycloheptyl]amino]-1*H*-imidazol-5-one,

- (171B). (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[(1R,4R)/(1S,4S)-4-hydroxycycloheptyl]amino]-1*H*-imidazol-5-one,
- (172). (±)-(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[*cis*-3-methoxycycloheptyl]amino]-1*H*-imidazol-5-one,
- 5 (173). (±)-(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[*trans*-3-methoxycycloheptyl]amino]-1*H*-imidazol-5-one,
- (174). (±)-(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[*cis*-4-methoxycycloheptyl]amino]-1*H*-imidazol-5-one,
- (175). (±)-(4Z)-4-(1,3-benzothiazol-6-ylmethylene)-2-[[*trans*-4-methoxycycloheptyl]amino]-1*H*-imidazol-5-one,
- 10 (176). (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[(1R)-2-methoxy-1-phenyl-ethyl]amino]-1*H*-imidazol-5-one,
- (177). (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[(1S)-2-methoxy-1-phenyl-ethyl]amino]-1*H*-imidazol-5-one,
- 15 (178). (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[(2R)-2-hydroxy-2-phenyl-ethyl]amino]-1*H*-imidazol-5-one,
- (179). (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[(2S)-2-hydroxy-2-phenyl-ethyl]amino]-1*H*-imidazol-5-one,
- (180). (4Z)-2-[[(1R)-2-Amino-1-phenyl-ethyl]amino]-4-(1,3-benzothiazol-6-ylmethylene)-1*H*-imidazol-5-one dihydrochloride,
- 20 (181). (4Z)-2-[[(1S)-2-Amino-1-phenyl-ethyl]amino]-4-(1,3-benzothiazol-6-ylmethylene)-1*H*-imidazol-5-one dihydrochloride,
- (182). (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[(3R)-quinuclidin-3-yl]amino]-1*H*-imidazol-5-one,
- 25 (183). (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[(3S)-quinuclidin-3-yl]amino]-1*H*-imidazol-5-one,
- (184). (±)-(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-(tetrahydrothiopyran-3-ylamino)-1*H*-imidazol-5-one,
- (185). (±)-(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-(1,4-dioxepan-6-ylamino)-1*H*-imidazol-5-one,
- 30 (186). (±)-(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(2-oxopyrrolidin-3-yl)amino]-1*H*-imidazol-5-one,

- (187). (±)-(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(1-methyl-2-oxo-pyrrolidin-3-yl)amino]-1*H*-imidazol-5-one,
- (188). (±)-(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(4,4-dimethyl-2-oxo-pyrrolidin-3-yl)amino]-1*H*-imidazol-5-one,
- 5 (189). (3*R*)-3-[[4*Z*]-4-(1,3-Benzothiazol-6-ylmethylene)-5-oxo-1*H*-imidazol-2-yl]amino]piperidin-2-one,
- (190). (±)-3-[[4*Z*]-4-(1,3-Benzothiazol-6-ylmethylene)-5-oxo-1*H*-imidazol-2-yl]amino]-1-methyl-piperidin-2-one,
- (191). (±)-(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(3-methyl-2-oxo-pyrrolidin-3-yl)amino]-1*H*-imidazol-5-one,
- 10 (192). (±)-(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(1,3-dimethyl-2-oxo-pyrrolidin-3-yl)amino]-1*H*-imidazol-5-one,
- (192A). (4*Z*)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(3*R*)/(3*S*)-1,3-dimethyl-2-oxo-pyrrolidin-3-yl]amino]-1*H*-imidazol-5-one,
- 15 (192B). (4*Z*)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(3*R*)/(3*S*)-1,3-dimethyl-2-oxo-pyrrolidin-3-yl]amino]-1*H*-imidazol-5-one,
- (193). (4*Z*)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(3*S*,4*S*)-4-hydroxytetrahydropyran-3-yl]amino]-1*H*-imidazol-5-one,
- (194). (4*Z*)-2-(3-Noradamantylamino)-4-(1,3-benzothiazol-6-ylmethylene)-1*H*-imidazol-5-one,
- 20 (195). [3-[[4*Z*]-4-(1,3-Benzothiazol-6-ylmethylene)-5-oxo-1*H*-imidazol-2-yl]amino]-1-adamantyl] *N*-*tert*-butylcarbamate,
- (196). (4*Z*)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(3-fluoro-1-adamantyl)amino]-1*H*-imidazol-5-one,
- 25 (197). (4*Z*)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(1*R*)-1-(*tert*-butoxymethyl)-3-methyl-butyl]amino]-1*H*-imidazol-5-one,
- (198). (4*Z*)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(1*R*)-2-*tert*-butoxy-1-phenyl-ethyl]amino]-1*H*-imidazol-5-one,
- (199). *N*-[3-[[4*Z*]-4-(1,3-Benzothiazol-6-ylmethylene)-5-oxo-1*H*-imidazol-2-yl]amino]-1-adamantyl]acetamide,
- 30 (200). *N*-[3-[[4*Z*]-4-(1,3-Benzothiazol-6-ylmethylene)-5-oxo-1*H*-imidazol-2-yl]amino]-1-adamantyl]cyclopropanecarboxamide,

- (201). *N*-[3-[(4*Z*)-4-(1,3-Benzothiazol-6-ylmethylene)-5-oxo-1*H*-imidazol-2-yl]amino]-1-adamantyl]methanesulfonamide,
- (202). *N*-[3-[(4*Z*)-4-(1,3-Benzothiazol-6-ylmethylene)-5-oxo-1*H*-imidazol-2-yl]amino]-1-adamantyl]cyclopropanesulfonamide,
- 5 (203). (4*Z*)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[3-(dimethylamino)-1-adamantyl]amino]-1*H*-imidazol-5-one,
- (204). Methyl 2-[(4*Z*)-4-(1,3-benzothiazol-6-ylmethylene)-5-oxo-1*H*-imidazol-2-yl]amino]adamantane-2-carboxylate,
- (205). (4*Z*)-2-(Cyclohexylamino)-4-[(2-methyl-1,3-benzothiazol-6-yl)methylene]-1*H*-imidazol-5-one,
- 10 (206). (4*Z*)-2-(Cycloheptylamino)-4-[(2-methyl-1,3-benzothiazol-6-yl)methylene]-1*H*-imidazol-5-one,
- (207). (4*Z*)-2-[(1*R*)-1-(Methoxymethyl)-3-methyl-butyl]amino]-4-[(2-methyl-1,3-benzothiazol-6-yl)methylene]-1*H*-imidazol-5-one,
- 15 (208). (4*Z*)-2-[(1*R*)-2-Methoxy-1-phenyl-ethyl]amino]-4-[(2-methyl-1,3-benzothiazol-6-yl)methylene]-1*H*-imidazol-5-one,
- (209). (4*Z*)-2-(1-Adamantylamino)-4-[(2-methyl-1,3-benzothiazol-6-yl)methylene]-1*H*-imidazol-5-one, and
- (210). (4*Z*)-2-[(3-Hydroxy-1-adamantyl)amino]-4-[(2-methyl-1,3-benzothiazol-6-yl)methylene]-1*H*-imidazol-5-one,
- 20 (211). (4*Z*)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(3,5-dihydroxy-1-adamantyl)amino]-1*H*-imidazol-5-one,
- (212). (4*Z*)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(3,5,7-trifluoro-1-adamantyl)amino]-1*H*-imidazol-5-one,
- 25 (213). (4*Z*)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(1*R*)-1-(ethoxymethyl)-3-methyl-butyl]amino]-1*H*-imidazol-5-one,
- (214). (4*Z*)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(1*R*)-1-(benzyloxymethyl)-3-methyl-butyl]amino]-1*H*-imidazol-5-one,
- (215). (4*Z*)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(1*R*)-1-[(4-fluorophenyl)methoxymethyl]-3-methyl-butyl]amino]-1*H*-imidazol-5-one,
- 30 one,

(216). (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[*(1R)*-1-(cyclopropoxymethyl)-3-methyl-butyl]amino]-1*H*-imidazol-5-one, or anyone of their pharmaceutically acceptable salts.

According to an even more preferred embodiment of the present invention, the compound of formula (I) is chosen from the group consisting of compounds (4), (5), (6), (7), (8), (9), (12), (13), (14), (16), (17), (18), (19), (20), (21), (22), (23), (24), (25), (27), (28), (30), (31), (32), (34), (35), (36), (38), (40), (41), (42), (43), (44), (46), (48), (49), (50), (51), (53), (55), (56), (57), (59), (60), (61), (62), (63), (64), (65), (66), (67), (68), (69), (70), (71), (72), (73), (74), (77), (78), (80), (81), (83), (85), (86), (89), (90), (92), (93), (94), (95), (96), (97), (98), (99), (104), (106), (108), (117), (119), (125), (127), (128), (135), (146), (147), (148), (149), (149A), (149B), (150), (151), (154), (155), (157), (158), (159), (160), (161), (162), (164), (165), (167), (168), (169), (169A), (169B), (170), (171), (171A), (171B), (172), (173), (174), (175), (176), (178), (179), (180), (181), (182), (184), (185), (191), (192), (192A), (194), (195), (196), (197), (198), (199), (200), (201), (203), (204), (208), (209), (210) and their pharmaceutically acceptable salts.

According to an even more preferred embodiment of the present invention, the compound of formula (I) is chosen from the group consisting of compounds (6), (7), (8), (9), (12), (14), (16), (17), (19), (20), (21), (22), (24), (25), (27), (28), (31), (32), (34), (35), (36), (38), (40), (41), (43), (44), (46), (48), (49), (51), (53), (55), (56), (57), (59), (61), (62), (63), (64), (65), (66), (67), (68), (69), (74), (77), (78), (81), (83), (85), (86), (89), (90), (92), (93), (95), (96), (97), (98), (99), (108), (119), (125), (146), (148), (149), (149A), (149B), (150), (151), (155), (157), (158), (159), (160), (161), (162), (164), (165), (167), (168), (169), (169A), (169B), (170), (171), (171A), (171B), (172), (173), (174), (175), (176), (178), (179), (180), (181), (182), (184), (185), (191), (192), (192A), (194), (195), (196), (197), (198), (199), (200), (201), (203), (204), (208), and their pharmaceutically acceptable salts.

According to an even more preferred embodiment of the present invention, the compound of formula (I) is chosen from the group consisting of compounds (9), (16), (17), (19), (20), (21), (22), (25), (27), (34), (35), (40), (48), (61), (65), (66), (78), (81), (83), (89), (95), (96), (97), (99), (158), (159), (160), (162), (169), (172), (173), (175), (176), (184), (194), (195), (196), (199), (200), (201), (203), (210) and their pharmaceutically acceptable salts.

According to an alternative embodiment of the present invention, the compound of formula (I) is chosen from the group consisting of compounds (1), (3), (4), (5), (6), (7), (8), (9), (10), (12), (13), (14), (16), (17), (19), (20), (21), (22), (23), (24), (25), (26), (27), (28), (30), (31), (32), (33), (34), (35), (36), (37), (38), (39), (40), (41), (42), (43), (44), (45),
5 (46), (47), (48), (49), (50), (51), (53), (55), (56), (57), (58), (59), (60), (61), (62), (63), (64), (65), (66), (67), (68), (69), (70), (71), (72), (73), (74), (75), (76), (77), (78), (79), (80), (81), (82), (83), (85), (86), (88), (89), (90), (92), (93), (94), (95), (96), (97), (98), (99), (100), (101), (102), (103), (104), (105), (106), (107), (108), (109), (110), (111), (113), (117), (119), (120), (121), (126), (127), (128), (129), (130), (131), (132), (135), (137), (139),
10 (141), (144), (145), (146), (147), (148), (149), (149A), (149B), (150), (151), (154), (155), (156), (157), (158), (159), (160), (161), (162), (163), (164), (165), (166), (167), (168), (169), (169A), (169B), (170), (171), (171A), (171B), (172), (173), (174), (175), (176), (178), (179), (180), (181), (182), (183), (184), (185), (191), (192), (192A), (192B), (194), (195), (196), (197), (198), (199), (200), (201), (203), (208), (209), (210), and their
15 pharmaceutically acceptable salts.

According to a preferred embodiment of the present invention, the compound of formula (I) is chosen from the group consisting of compounds (1), (4), (5), (6), (7), (8), (9), (10), (12), (13), (14), (16), (17), (19), (20), (21), (22), (23), (24), (25), (26), (27), (28), (30), (31), (32), (33), (34), (35), (36), (38), (40), (41), (43), (44), (46), (48), (49), (51), (53), (55),
20 (56), (57), (59), (61), (62), (63), (64), (65), (66), (67), (68), (69), (70), (71), (73), (74), (76), (77), (78), (79), (80), (81), (82), (83), (85), (86), (88), (89), (90), (92), (93), (94), (95), (96), (97), (98), (99), (100), (101), (102), (104), (105), (106), (108), (109), (113), (117), (119), (127), (128), (130), (131), (135), (139), (141), (146), (147), (148), (149), (149A), (149B), (150), (151), (155), (156), (157), (158), (159), (160), (161), (162), (163), (164), (165),
25 (166), (167), (168), (169), (169A), (169B), (170), (171), (171A), (171B), (172), (173), (174), (175), (176), (178), (179), (180), (181), (182), (183), (184), (185), (191), (192), (192A), (192B), (194), (195), (196), (198), (199), (200), (201), (203), (210), and their pharmaceutically acceptable salts.

According to an even more preferred embodiment of the present invention, the
30 compound of formula (I) is chosen from the group consisting of compounds (9), (16), (19), (20), (21), (35), (48), (61), (73), (78), (81), (95), (96), (155), (159), (160), (161), (169),

(169A), (171A), (176), (184), (196), (199), (200), (201), (203), (210), and their pharmaceutically acceptable salts.

According to a further embodiment of the present invention, the compound of formula (I) is chosen from the group consisting of compounds (7), (8), (9), (10), (12), (16),
5 (17), (19), (20), (21), (23), (25), (26), (28), (32), (33), (34), (35), (40), (41), (43), (44), (46), (48), (55), (56), (57), (59), (61), (62), (63), (65), (66), (67), (68), (69), (70), (73), (77), (78), (81), (83), (88), (89), (90), (95), (96), (97), (98), (99), (100), (101), (102), (104), (105), (106), (117), (119), (127), (131), (139), (148), (149), (149B), (151), (155), (156), (157), (158), (159), (160), (161), (164), (165), (167), (169), (169A), (169B), (170), (171), (171A),
10 (171B), (172), (173), (176), (178), (179), (180), (181), (184), (185), (191), (192), (192A), (194), (196), (198), (199), (200), (201), (203), (210) and their pharmaceutically acceptable salts.

The groups of compounds as defined by the list of compounds as identified in Example 4 below through tables 4A to table 4F and specifically identified as most potent
15 kinase inhibitors, as well as multi-target kinase inhibitors, also form part of the present invention.

According to another aspect, a subject-matter of the present invention relates to a compound of formula (I) as defined above or any of its pharmaceutically acceptable salts, or at least any of compounds (1) to (216) or any of its pharmaceutically acceptable salts, for
20 use as a medicament.

« Pharmaceutically acceptable salt thereof » refers to salts which are formed from acid addition salts formed with inorganic acids (*e.g.* hydrochloric acid, hydrobromic acid), as well as salts formed with organic acids such as acetic acid, tartaric acid, succinic acid.

25 Suitable physiologically acceptable acid addition salts of compounds of formula (I) include hydrobromide, tartrate, hydrochloride, succinate and acetate.

The compounds of formula (I), and any of compounds (1) to (216) or any of their pharmaceutically acceptable salts may form solvates or hydrates and the invention includes all such solvates and hydrates.

30 The terms "hydrates" and "solvates" simply mean that the compounds (I) according to the invention can be in the form of a hydrate or solvate, *i.e.* combined or associated with one or more water or solvent molecules. This is only a chemical

characteristic of such compounds, which can be applied for all organic compounds of this type.

The compounds of formula (I) can comprise one or more asymmetric carbon atoms. They can thus exist in the form of enantiomers or of diastereoisomers. These
5 enantiomers, diastereoisomers and their mixtures, including the racemic mixtures, are encompassed within the scope of the present invention.

The compounds of the present invention can be prepared by conventional methods of organic synthesis practiced by those skilled in the art. The general reaction sequences outlined below represent a general method useful for preparing the compounds
10 of the present invention and are not meant to be limiting in scope or utility.

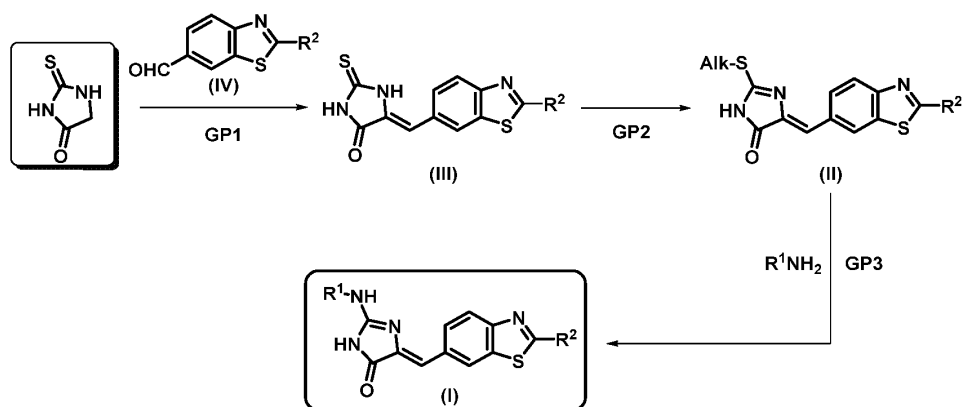
List of abbreviations:

Abbreviation/acronym	name
Ac	Acetyl
ACN	Acetonitrile
Alk	Alkyl
ATP	Adenosine triphosphate
br s	Broad singlet
c	Molar concentration
Cpd N°	Compound number
d	Doublet
DCM	Methylene chloride
dd	Doublet of doublets
DIPEA	<i>N,N</i> -Diisopropylethylamine
DMF	Dimethylformamide
DMSO	Dimethylsulfoxide
DTT	Dithiothreitol
Eq	Equivalent
ESI	Electrospray ionization
Et	Ethyl
FC	Flash chromatography
GP	General protocol
GST	Glutathione <i>S</i> -transferase
Hal	Halogen
HEPES	4-(2-Hydroxyethyl)-1-piperazineethanesulfonic acid
His-tagged	Polyhistidine-tagged
HPLC	High pressure liquid chromatography
IC₅₀	Half maximal inhibitory concentration
m	Multiplet
M	Molarity
Me	Methyl
MS	Mass spectroscopy
MW	Molecular weight
NMR	Nuclear magnetic resonance
N/A	Not applicable
n.t.	Not tested
Piv	Pivaloyl

Abbreviation/acronym	name
Rac	Racemic
r.t.	Room temperature
s	Singlet
SFC	Supercritical fluid chromatography
SDS-PAGE	Sodium dodecyl sulfate-polyacrylamide gel electrophoresis
t	Triplet
TEA	Triethylamine
TFA	Trifluoroacetic acid
THF	Tetrahydrofuran
TLC	Thin layer chromatography
T °C	Temperature in degrees Celsius
PTLC	Preparative thin layer chromatography
UV	Ultraviolet
v/v	Volume per volume
w/v	Weight per volume
δ_H	Hydrogen chemical shift
μw	Microwave irradiation

The compounds of general formula (I) can be prepared according to scheme 1 below.

Scheme 1: Synthetic route:



5

The synthesis of compounds according to the invention is based on a functionalization of a compound of formula (II) by an amine of formula R^1NH_2 wherein R^1 is as defined above, following the general protocol 3 (GP3), described herein after.

According to GP3, the compound of formula (II) may be placed in an aprotic solvent such as THF or dioxane, or a mixture of both. The amine of formula R^1NH_2 may be added, for example in a molar ratio ranging from 2 to 6, in particular of 4, with respect to the compound of formula (II). The reaction mixture may be placed in a sealed tube and
5 may receive energy, for example from a heating block or from microwaves. Upon completion of the reaction, the mixture may be brought back to room temperature.

In an embodiment named GP3-A, the reaction mixture may be stirred at a temperature ranging from -10 °C to 10 °C, for example at 0 °C, for a duration ranging from 30 minutes to 2 hours, for example for 1 hour. Depending on the state of the product
10 obtained (solid, precipitate), purification methods well-known by the person skilled in the art may be performed, for example filtering, washing, triturating, drying *in vacuo*, flash chromatography, precipitating and refluxing.

In an embodiment named GP3-B, wherein the product failed to precipitate, the reaction mixture may be concentrated, in particular *in vacuo*, and purified, in particular by
15 flash chromatography. A second purification step may be performed, in particular selected from reprecipitation, trituration and recrystallization.

In another embodiment named GP3-C, wherein the product failed to precipitate, the reaction mixture may be concentrated, in particular *in vacuo*, and the resulting crude may be purified by trituration in a protic polar solvent such as ethanol. Said
20 trituration may be performed at a temperature comprised between 20 and 100°C, in particular at room temperature. A second purification step may be performed, in particular selected from reprecipitation, trituration and recrystallization.

A compound of formula (II) as defined above may be obtained by the
25 S-alkylation of a compound of formula (III) wherein R^2 is as defined above and Alk is a (C_1-C_5) alkyl.

According to the general protocol GP2, a compound of formula (III) may be placed in a polar aprotic solvent such as dimethylformamide (DMF). An alkylhalide of formula Alk-Hal wherein Hal is an halide such as iodine or bromine may then be added
30 dropwise, for example in a molar ratio ranging from 0.75 to 1.50, in particular of 1.05, with respect to the compound of formula (III), in presence of an inorganic base such as K_2CO_3 , for example in a molar ratio ranging from 0.7 to 1.5, in particular of 1, still with respect to

the compound of formula (III). The reaction mixture may be stirred during the addition of the alkylhalide.

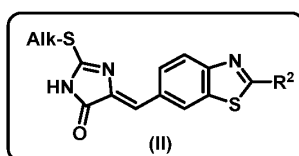
In a particular embodiment, the resulting mixture may then be stirred, for example from 8 to 16 hours, in particular for 12 hours at room temperature.

5 In another embodiment, the resulting mixture may be stirred, for example from 2 to 8 hours, in particular for 6 hours, at a temperature ranging from -10 °C to 10 °C, in particular at 0 °C.

A compound of formula (III) as defined above may be obtained from a compound of formula (IV) wherein R² is as defined above, following the general protocol
10 GP1.

According to GP1, the compound of formula (IV) may be placed in a protic solvent such as ethanol in presence of 2-thiohydantoin, for example in a molar ratio ranging from 0.85 to 1.15, in particular of 1, with respect to the compound of formula (IV), in presence of an organic base such as piperidine in a molar ratio ranging from 0.85 to 1.15, in particular of 1, still with respect to the compound of formula (II), in presence of an organic acid such as acetic acid for example in a molar ratio ranging from 0.85 to 1.15, in particular of 1, still with respect to the compound of formula (IV). The reaction mixture may be placed in a sealed tube, stirred and heated at a temperature ranging for example from 60 °C to 130 °C, in particular from 80 °C to a duration ranging from 10 to 100
20 minutes, in particular from 15 to 90 minutes. The reaction mixture may be irradiated, for example by microwaves.

Accordingly, the present invention further relates to the synthesis process for manufacturing new compounds of formula (I) as defined above, comprising at least a step
25 of substituting a compound of formula (II) with a primary amine. The present invention relates to a synthesis process for manufacturing a compound of formula (I) as defined above or any of its pharmaceutically acceptable salt or any of the compounds (1) to (216) as defined above or any of their pharmaceutically acceptable salts, comprising at least a step of coupling a compound of formula (II) below

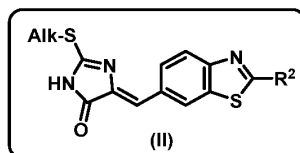


30

wherein Alk is a (C₁-C₅)alkyl,

with an amine of formula R¹NH₂ wherein R¹ and R² are as defined above.

The present invention further relates to a synthetic intermediate of formula (II)
below



wherein Alk is a (C₁-C₅)alkyl, in particular Alk is selected from the group consisting of an ethyl and a methyl and R² is as defined above.

The chemical structures, the analytical and spectroscopic data of some compounds of formula (I) of the invention are illustrated respectively in the following Table 2 and Table 3.

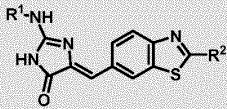
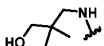
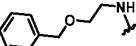
Reactions were performed using oven-dried glassware under inert atmosphere of argon. Unless otherwise noted, all reagent-grade chemicals and solvents were obtained from commercial suppliers and were used as received. Reactions were monitored by thin-layer chromatography with silica gel 60 F254 pre-coated aluminium plates (0.25 mm). Visualization was performed under UV light and 254 or 312 nm, or with appropriate TLC stains including, but not limited to: phosphomolybdic acid, KMnO₄, ninhydrin, CAM, vanillin, *p*-anisaldehyde.

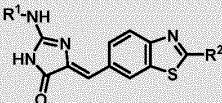
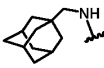
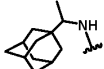
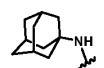
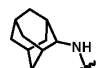
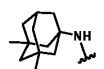
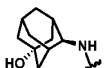
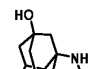
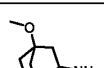
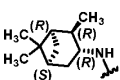
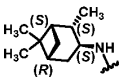
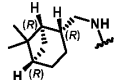
Microwave experiments were conducted in an Anton Paar Monowave 400[®] microwave reactor. The experiments were conducted in a monomode cavity with a power delivery ranging from 0 to 850 W, allowing pressurized reactions (0 to 30 bar) to be performed in sealed glass vials (4 to 30 mL) equipped with snap caps and silicon septa. The temperature (0 to 300 °C) was monitored by a contactless infrared sensor and calibrated with a ruby thermometer. Temperature, pressure, and power profiles were edited and monitored through a touch-screen control panel. Times indicated in the various protocols are the times measured when the mixtures reached the programmed temperature after a ramp period of 3 min.

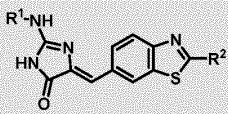
Chromatographic purifications of compounds were achieved on an automated Interchim Puriflash XS420 equipped with 30 μm spherical silica-filled preppacked columns as stationary phase.

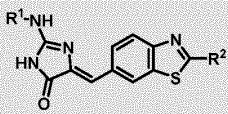
- Some compounds of the invention are described with their structure in the
- 5 below Table 2, which is merely illustrative and does not limit the scope of the present invention.

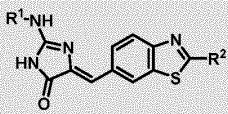
Table 2: Structure of compounds (1) to (216). Formulas and molecular weights were generated using Perkin Elmer's Chemdraw® version 17.1.0.105.

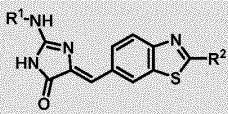
						
Cpd N°	R ¹ -NH-	R ²	Class	Formula	MW	Stereochemistry
1		H	A1	C ₁₅ H ₁₄ N ₄ OS	298.36	N/A
2		H	A1	C ₁₄ H ₁₂ N ₄ OS	284.34	N/A
3		H	A1	C ₁₅ H ₁₄ N ₄ OS	298.36	N/A
4		H	A1	C ₁₆ H ₁₆ N ₄ OS	312.39	N/A
5		H	A1	C ₁₈ H ₂₀ N ₄ OS	340.45	N/A
6		H	A1	C ₁₇ H ₁₈ N ₄ OS	326.42	N/A
7		H	A1	C ₁₉ H ₂₂ N ₄ OS	354.47	N/A
8		H	A1	C ₁₈ H ₂₀ N ₄ OS	340.45	N/A
9		H	A1	C ₁₉ H ₂₂ N ₄ OS	354.47	N/A
10		H	A1	C ₁₆ H ₁₈ N ₄ O ₂ S	330.41	N/A
11		H	A1	C ₂₀ H ₁₈ N ₄ O ₂ S	378.45	N/A
12		H	A1	C ₁₈ H ₂₀ N ₄ OS	340.45	<i>trans</i> - rac

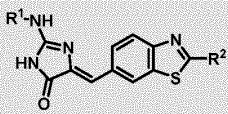
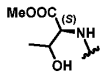
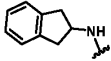
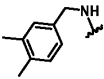
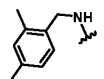
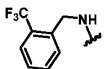
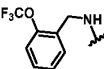
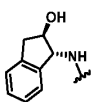
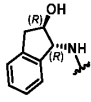
						
Cpd N°	R ¹ -NH-	R ²	Class	Formula	MW	Stereochemistry
13		H	A1	C ₁₉ H ₂₂ N ₄ OS	354.47	(1R)
14		H	A1	C ₂₂ H ₂₄ N ₄ OS	392.17	N/A
15		H	A1	C ₂₃ H ₂₆ N ₄ OS	406.55	rac
16		H	A1	C ₂₁ H ₂₂ N ₄ OS	378.49	N/A
17		H	A1	C ₂₁ H ₂₂ N ₄ OS	378.49	N/A
18		H	A1	C ₂₃ H ₂₆ N ₄ OS	406.55	N/A
19		H	A1	C ₂₁ H ₂₂ N ₄ O ₂ S	394.49	<i>trans</i>
20		H	A1	C ₂₁ H ₂₂ N ₄ O ₂ S	394.49	N/A
21		H	A1	C ₂₂ H ₂₄ N ₄ O ₂ S	408.52	N/A
22		H	A1	C ₂₁ H ₂₄ N ₄ OS	380.51	(1R,2R,3R,5S)
23		H	A1	C ₂₁ H ₂₄ N ₄ OS	380.51	(1S,2S,3S,5R)
24		H	A1	C ₂₁ H ₂₄ N ₄ OS	380.51	(1R,2R,5R)

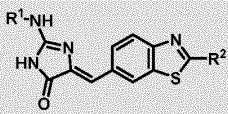
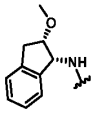
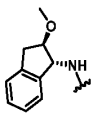
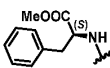
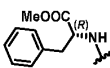
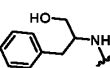
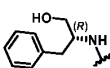
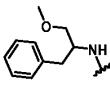
						
Cpd N°	R ¹ -NH-	R ²	Class	Formula	MW	Stereochemistry
25		H	A1	C ₁₉ H ₂₀ N ₄ OS	352.46	rac
26		H	A1	C ₁₈ H ₁₈ N ₄ OS	338.43	N/A
27		H	A1	C ₂₁ H ₂₄ N ₄ OS	380.51	(2R)
28		H	A1	C ₁₈ H ₁₈ N ₄ OS	380.51	rac
29		H	A1	C ₂₁ H ₂₆ N ₄ OS	382.53	(1R,2S,5R)
30		H	A1	C ₂₀ H ₂₄ N ₄ O ₂ S	384.50	(1R)
31		H	A1	C ₁₉ H ₂₂ N ₄ O ₂ S	370.47	(1R)
32		H	A1	C ₁₈ H ₂₀ N ₄ O ₂ S	356.44	(1R)
33		H	A1	C ₁₇ H ₁₈ N ₄ O ₂ S	342.42	(1R)
34		H	A1	C ₁₇ H ₂₀ N ₄ O ₂ S	344.43	(1R)
35		H	A1	C ₁₈ H ₂₂ N ₄ O ₂ S	344.43	(1R)
36		H	A1	C ₁₇ H ₂₀ N ₄ O ₂ S	344.43	(1S)

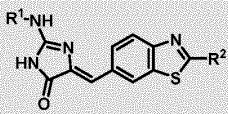
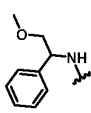
						
Cpd N°	R ¹ -NH-	R ²	Class	Formula	MW	Stereochemistry
37		H	A1	C ₁₈ H ₂₂ N ₄ O ₂ S	344.43	(1 <i>S</i>)
38		H	A1	C ₁₅ H ₁₆ N ₄ O ₂ S	316.38	(1 <i>R</i>)
39		H	A1	C ₁₅ H ₁₆ N ₄ O ₂ S	316.38	(1 <i>S</i>)
40		H	A1	C ₁₇ H ₁₉ FN ₄ OS	346.42	rac
41		H	A1	C ₁₉ H ₂₂ N ₄ O ₂ S	370.47	rac
42		H	A1	C ₂₀ H ₂₄ N ₄ O ₂ S	384.50	rac
43		H	A1	C ₁₉ H ₂₂ N ₄ O ₂ S	384.50	rac
44		H	A1	C ₂₀ H ₂₄ N ₄ O ₂ S	384.50	rac
45		H	A1	C ₁₆ H ₁₆ N ₄ O ₂ S	328.39	<i>cis</i> - rac
46		H	A1	C ₁₆ H ₁₆ N ₄ O ₂ S	328.39	<i>trans</i> - rac
47		H	A1	C ₁₇ H ₁₈ N ₄ O ₂ S	342.42	<i>cis</i> - rac
48		H	A1	C ₁₇ H ₁₈ N ₄ O ₂ S	342.42	<i>trans</i> - rac

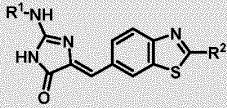
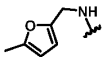
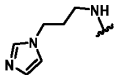
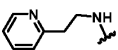
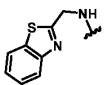
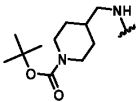
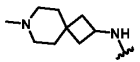
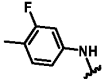
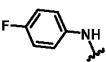
						
Cpd N°	R ¹ -NH-	R ²	Class	Formula	MW	Stereochemistry
49		H	A1	C ₁₇ H ₁₈ N ₄ O ₂ S	342.42	<i>cis</i> - rac
50		H	A1	C ₁₇ H ₁₈ N ₄ O ₂ S	342.42	<i>trans</i> - rac
51		H	A1	C ₁₇ H ₁₈ N ₄ O ₂ S	342.42	(1 <i>R</i> ,2 <i>S</i>)
52		H	A1	C ₁₇ H ₁₈ N ₄ O ₂ S	342.42	(1 <i>S</i> ,2 <i>R</i>)
53		H	A1	C ₁₇ H ₁₈ N ₄ O ₂ S	342.42	(1 <i>R</i> ,2 <i>R</i>)
54		H	A1	C ₁₇ H ₁₈ N ₄ O ₂ S	342.42	(1 <i>S</i> ,2 <i>S</i>)
55		H	A1	C ₁₇ H ₁₈ N ₄ O ₂ S	342.42	<i>cis</i> - rac
56		H	A1	C ₁₇ H ₁₈ N ₄ O ₂ S	342.42	<i>trans</i> - rac
57		H	A1	C ₁₇ H ₁₈ N ₄ O ₂ S	342.42	<i>trans</i>
58		H	A1	C ₁₈ H ₂₀ N ₄ O ₂ S	356.44	<i>cis</i> - rac
59		H	A1	C ₁₈ H ₂₀ N ₄ O ₂ S	356.44	<i>trans</i> - rac
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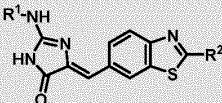
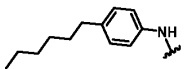
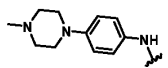
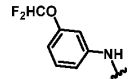
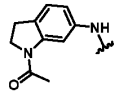
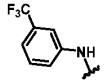
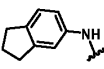
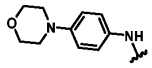
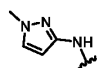
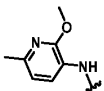
						
Cpd N°	R ¹ -NH-	R ²	Class	Formula	MW	Stereochemistry
61		H	A1	C ₁₈ H ₂₀ N ₄ O ₂ S	356.44	<i>cis</i> - rac
62		H	A1	C ₁₈ H ₂₀ N ₄ O ₂ S	356.44	<i>trans</i> - rac
63		H	A1	C ₁₈ H ₂₀ N ₄ O ₂ S	356.44	(1 <i>R</i> ,2 <i>R</i>)
64		H	A1	C ₁₈ H ₂₀ N ₄ O ₂ S	356.44	(1 <i>S</i> ,2 <i>S</i>)
65		H	A1	C ₁₈ H ₂₀ N ₄ O ₂ S	356.44	<i>cis</i> - rac
66		H	A1	C ₁₈ H ₂₀ N ₄ O ₂ S	356.44	<i>trans</i> - rac
67		H	A1	C ₁₉ H ₂₂ N ₄ O ₂ S	370.47	<i>cis</i> - rac
68		H	A1	C ₁₉ H ₂₂ N ₄ O ₂ S	370.47	<i>trans</i> - rac
69		H	A1	C ₁₇ H ₁₈ N ₄ O ₃ S	358.42	(2 <i>S</i>)
70		H	A1	C ₁₅ H ₁₄ N ₄ O ₃ S	330.36	(2 <i>S</i>)
71		H	A1	C ₁₈ H ₂₀ N ₄ O ₃ S	372.44	(2 <i>S</i>)
72		H	A1	C ₁₈ H ₂₀ N ₄ O ₃ S	372.44	(2 <i>R</i>)

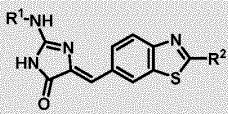
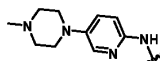
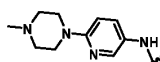
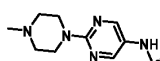
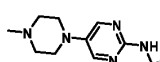
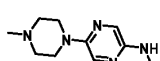
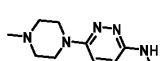
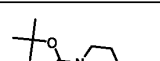
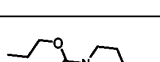
						
Cpd N°	R ¹ -NH-	R ²	Class	Formula	MW	Stereochemistry
73		H	A1	C ₁₆ H ₁₆ N ₄ O ₄ S	360.39	(2 <i>S</i>)
74		H	A2	C ₁₈ H ₁₄ N ₄ OS	334.40	N/A
75		H	A2	C ₂₀ H ₁₆ N ₄ OS	360.44	N/A
76		H	A2	C ₂₀ H ₁₈ N ₄ OS	362.45	N/A
77		H	A2	C ₂₀ H ₁₈ N ₄ OS	362.45	N/A
78		H	A2	C ₁₉ H ₁₃ F ₃ N ₄ OS	402.40	N/A
79		H	A2	C ₁₉ H ₁₃ F ₃ N ₄ O ₂ S	418.39	N/A
80		H	A2	C ₂₀ H ₁₆ N ₄ O ₂ S	376.43	<i>cis</i> - rac
81		H	A2	C ₂₀ H ₁₆ N ₄ O ₂ S	376.43	<i>trans</i> - rac
82		H	A2	C ₂₀ H ₁₆ N ₄ O ₂ S	376.43	(1 <i>R</i> ,2 <i>R</i>)
83		H	A2	C ₂₀ H ₁₆ N ₄ O ₂ S	376.43	(1 <i>S</i> ,2 <i>S</i>)

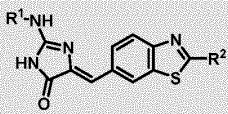
						
Cpd N°	R ¹ -NH-	R ²	Class	Formula	MW	Stereochemistry
84		H	A2	C ₂₁ H ₁₈ N ₄ O ₂ S	390.46	<i>cis</i> - rac
85		H	A2	C ₂₁ H ₁₈ N ₄ O ₂ S	390.46	<i>trans</i> - rac
86		H	A2	C ₂₁ H ₁₈ N ₄ O ₃ S	406.46	(2 <i>S</i>)
87		H	A2	C ₂₁ H ₁₈ N ₄ O ₃ S	406.46	(2 <i>R</i>)
88		H	A2	C ₁₉ H ₁₅ FN ₄ OS	366.41	rac
89		H	A2	C ₁₉ H ₁₉ Cl ₂ N ₅ OS	436.36	rac
90		H	A2	C ₂₀ H ₂₁ Cl ₂ N ₅ OS	450.38	rac
91		H	A2	C ₂₁ H ₂₁ N ₅ OS	391.49	rac
92		H	A2	C ₂₀ H ₁₈ N ₄ O ₂ S	378.45	rac
93		H	A2	C ₂₀ H ₁₈ N ₄ O ₂ S	378.45	(1 <i>R</i>)
94		H	A2	C ₂₁ H ₂₀ N ₄ O ₂ S	392.48	rac

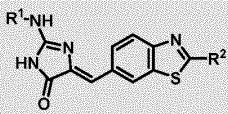
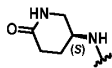
						
Cpd N°	R ¹ -NH-	R ²	Class	Formula	MW	Stereochemistry
95		H	A2	C ₁₉ H ₁₆ N ₄ O ₂ S	364.42	rac
96		H	A2	C ₁₉ H ₁₆ N ₄ O ₂ S	364.42	(1R)
97		H	A2	C ₁₉ H ₁₆ N ₄ O ₂ S	364.42	(1S)
98		H	A2	C ₂₀ H ₁₈ N ₄ O ₂ S	378.45	rac
99		H	A2	C ₁₉ H ₁₆ N ₄ O ₂ S	364.42	rac
100		H	A2	C ₂₀ H ₁₈ N ₄ O ₂ S	378.45	rac
101		H	A2	C ₂₀ H ₁₈ N ₄ O ₂ S	378.45	rac
102		H	A2	C ₂₁ H ₂₀ N ₄ O ₂ S	392.48	rac
103		H	A3	C ₁₇ H ₁₄ N ₆ OS	350.41	N/A
104		H	A3	C ₁₇ H ₁₃ N ₅ OS	335.39	N/A
105		H	A3	C ₁₇ H ₁₃ N ₅ OS	335.39	N/A

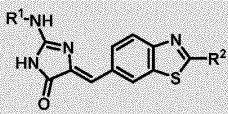
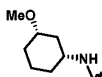
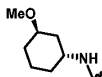
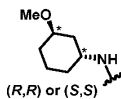
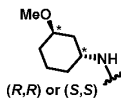
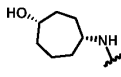
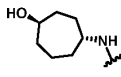
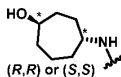
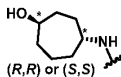
						
Cpd N°	R ¹ -NH-	R ²	Class	Formula	MW	Stereochemistry
106		H	A3	C ₁₇ H ₁₃ N ₅ OS	335.39	N/A
107		H	A3	C ₁₇ H ₁₄ N ₄ O ₂ S	338.39	N/A
108		H	A3	C ₁₆ H ₁₃ N ₅ OS ₂	355.43	N/A
109		H	A3	C ₁₇ H ₁₆ N ₆ OS	352.42	N/A
110		H	A3	C ₁₈ H ₁₅ N ₅ OS	349.41	N/A
111		H	A3	C ₁₉ H ₁₃ N ₅ OS ₂	391.47	N/A
112		H	A4	C ₁₈ H ₂₁ N ₅ OS	355.46	N/A
113		H	A4	C ₁₇ H ₁₈ N ₄ O ₂ S	342.42	N/A
114		H	A4	C ₂₂ H ₂₇ N ₅ O ₃ S	441.55	N/A
115		H	A4	C ₂₀ H ₂₃ N ₅ OS	381.50	N/A
116		H	A5	C ₁₈ H ₁₃ FN ₄ OS	352.39	N/A
117		H	A5	C ₁₇ H ₁₁ FN ₄ OS	338.37	N/A

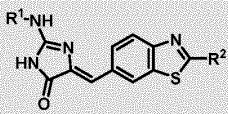
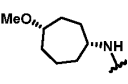
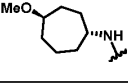
						
Cpd N°	R ¹ -NH-	R ²	Class	Formula	MW	Stereochemistry
118		H	A5	C ₂₃ H ₂₄ N ₄ OS	404.53	N/A
119		H	A5	C ₂₂ H ₂₂ N ₆ OS	418.52	N/A
120		H	A5	C ₁₈ H ₁₂ F ₂ N ₄ O ₂ S	386.37	N/A
121		H	A5	C ₂₁ H ₁₇ N ₅ O ₂ S	403.47	N/A
122		H	A5	C ₁₈ H ₁₁ F ₃ N ₄ OS	388.37	N/A
123		H	A5	C ₂₀ H ₁₆ N ₄ OS	360.44	N/A
124		H	A5	C ₂₁ H ₁₉ N ₅ O ₂ S	405.48	N/A
125		H	A5	C ₁₉ H ₁₄ N ₆ OS	374.42	N/A
126		H	A6	C ₁₅ H ₁₀ N ₆ OS	322.35	N/A
127		H	A6	C ₁₆ H ₁₁ N ₅ OS	321.36	N/A
128		H	A6	C ₁₅ H ₁₂ N ₆ OS	324.37	N/A
129		H	A6	C ₁₈ H ₁₅ N ₅ O ₂ S	365.41	N/A

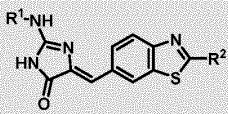
						
Cpd N°	R ¹ -NH-	R ²	Class	Formula	MW	Stereochemistry
130		H	A6	C ₁₅ H ₁₀ N ₆ OS	322.35	N/A
131		H	A6	C ₁₆ H ₁₁ N ₅ OS	321.36	N/A
132		H	A6	C ₁₃ H ₈ N ₆ OS ₂	328.37	N/A
133		H	A6	C ₂₁ H ₂₁ N ₇ OS	419.51	N/A
134		H	A6	C ₂₁ H ₂₁ N ₇ OS	419.51	N/A
135		H	A6	C ₂₀ H ₂₀ N ₈ OS	420.50	N/A
136		H	A6	C ₂₀ H ₂₀ N ₈ OS	420.50	N/A
137		H	A6	C ₂₀ H ₂₀ N ₈ OS	420.50	N/A
138		H	A6	C ₂₀ H ₂₀ N ₈ OS	420.50	N/A
139		H	A7	C ₁₆ H ₁₆ N ₄ O ₂ S	328.39	N/A
140		H	A7	C ₂₁ H ₂₅ N ₅ O ₃ S	427.52	N/A
141		H	A7	C ₁₉ H ₂₁ N ₅ O ₃ S	399.47	N/A
142		H	A7	C ₁₇ H ₁₉ N ₅ OS	341.43	N/A

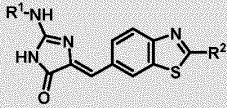
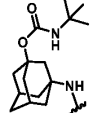
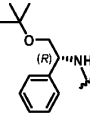
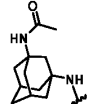
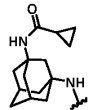
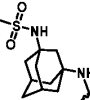
						
Cpd N°	R ¹ -NH-	R ²	Class	Formula	MW	Stereochemistry
143		H	A7	C ₁₇ H ₁₉ N ₅ O ₂ S	341.43	rac
144		H	A7	C ₁₄ H ₁₂ N ₄ O ₂ S	300.34	N/A
145		H	A7	C ₁₅ H ₁₄ N ₄ O ₂ S	314.36	(3R)
146		H	A7	C ₁₅ H ₁₄ N ₄ O ₂ S	314.36	(3S)
147		H	A7	C ₁₆ H ₁₆ N ₄ O ₂ S	328.39	(3R)
148		H	A7	C ₁₆ H ₁₆ N ₄ O ₂ S	328.39	(3S)
149		H	A7	C ₁₈ H ₂₀ N ₄ O ₂ S	356.44	rac
149A		H	A7	C ₁₈ H ₂₀ N ₄ O ₂ S	356.44	Enantiomer A (3R) or (3S)
149B		H	A7	C ₁₈ H ₂₀ N ₄ O ₂ S	356.44	Enantiomer B (3R) or (3S)
150		H	A7	C ₁₆ H ₁₆ N ₄ O ₃ S	344.39	(3R,4R)
151		H	A7	C ₁₇ H ₁₈ N ₄ O ₂ S	342.42	rac
152		H	A7	C ₁₆ H ₁₅ N ₅ O ₂ S	341.39	rac

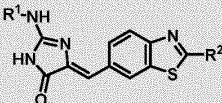
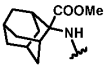
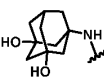
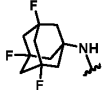
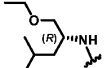
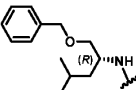
						
Cpd N ^o	R ¹ -NH-	R ²	Class	Formula	MW	Stereochemistry
153		H	A7	C ₁₆ H ₁₅ N ₅ O ₂ S	341.39	(3 <i>S</i>)
154		H	A7	C ₁₆ H ₁₅ N ₅ O ₂ S	341.39	(5 <i>S</i>)
155		H	A1	C ₁₆ H ₁₄ F ₂ N ₄ OS	348.37	rac
156		H	A1	C ₁₇ H ₁₆ F ₂ N ₄ OS	362.40	N/A
157		H	A1	C ₁₇ H ₁₆ F ₂ N ₄ OS	362.40	rac
158		H	A1	C ₁₇ H ₁₆ F ₂ N ₄ OS	362.40	rac
159		H	A1	C ₁₈ H ₁₈ F ₂ N ₄ OS	376.43	rac
160		H	A1	C ₁₇ H ₁₉ FN ₄ OS	346.42	(1 <i>R</i>)
161		H	A1	C ₁₇ H ₁₉ FN ₄ OS	346.42	(1 <i>S</i>)
162		H	A1	C ₂₃ H ₂₄ N ₄ O ₃ S	436.53	N/A
163		H	A1	C ₂₆ H ₃₀ N ₄ O ₃ S	478.61	N/A
164		H	A1	C ₁₇ H ₁₈ N ₄ O ₂ S	342.42	(1 <i>R</i> ,2 <i>R</i>)

						
Cpd N°	R ¹ -NH-	R ²	Class	Formula	MW	Stereochemistry
165		H	A1	C ₁₇ H ₁₈ N ₄ O ₂ S	342.42	(1 <i>S</i> ,2 <i>S</i>)
166		H	A1	C ₁₈ H ₂₀ N ₄ O ₂ S	356.44	(1 <i>R</i> ,2 <i>R</i>)
167		H	A1	C ₁₈ H ₂₀ N ₄ O ₂ S	356.44	(1 <i>S</i> ,2 <i>S</i>)
168		H	A1	C ₁₈ H ₂₀ N ₄ O ₂ S	356.44	<i>cis</i> -rac
169		H	A1	C ₁₈ H ₂₀ N ₄ O ₂ S	356.44	<i>trans</i> -rac
169A		H	A1	C ₁₈ H ₂₀ N ₄ O ₂ S	356.44	Enantiomer A (1 <i>R</i> ,3 <i>R</i>) or (1 <i>S</i> ,3 <i>S</i>)
169B		H	A1	C ₁₈ H ₂₀ N ₄ O ₂ S	356.44	Enantiomer B (1 <i>R</i> ,3 <i>R</i>) or (1 <i>S</i> ,3 <i>S</i>)
170		H	A1	C ₁₈ H ₂₀ N ₄ O ₂ S	356.44	<i>cis</i> -rac
171		H	A1	C ₁₈ H ₂₀ N ₄ O ₂ S	356.44	<i>trans</i> -rac
171A		H	A1	C ₁₈ H ₂₀ N ₄ O ₂ S	356.44	Enantiomer A (1 <i>R</i> ,4 <i>R</i>) or (1 <i>S</i> ,4 <i>S</i>)
171B		H	A1	C ₁₈ H ₂₀ N ₄ O ₂ S	356.44	Enantiomer B (1 <i>R</i> ,4 <i>R</i>) or (1 <i>S</i> ,4 <i>S</i>)

						
Cpd N°	R ¹ -NH-	R ²	Class	Formula	MW	Stereochemistry
172		H	A1	C ₁₉ H ₂₂ N ₄ O ₂ S	370.47	<i>cis</i> -rac
173		H	A1	C ₁₉ H ₂₂ N ₄ O ₂ S	370.47	<i>trans</i> -rac
174		H	A1	C ₁₉ H ₂₂ N ₄ O ₂ S	370.47	<i>cis</i> -rac
175		H	A1	C ₁₉ H ₂₂ N ₄ O ₂ S	370.47	<i>trans</i> -rac
176		H	A2	C ₂₀ H ₁₈ N ₄ O ₂ S	378.45	(1 <i>R</i>)
177		H	A2	C ₂₀ H ₁₈ N ₄ O ₂ S	378.45	(1 <i>S</i>)
178		H	A2	C ₁₉ H ₁₆ N ₄ O ₂ S	364.42	(2 <i>R</i>)
179		H	A2	C ₁₉ H ₁₆ N ₄ O ₂ S	364.42	(2 <i>S</i>)
180		H	A2	C ₁₉ H ₁₉ Cl ₂ N ₅ OS	436.36	(1 <i>R</i>)
181		H	A2	C ₁₉ H ₁₉ Cl ₂ N ₅ OS	436.36	(1 <i>S</i>)
182		H	A7	C ₁₈ H ₁₉ N ₅ OS	353.44	(3 <i>R</i>)

						
Cpd N°	R ¹ -NH-	R ²	Class	Formula	MW	Stereochemistry
183		H	A7	C ₁₈ H ₁₉ N ₅ OS	353.44	(3 <i>S</i>)
184		H	A7	C ₁₆ H ₁₆ N ₄ OS ₂	344.45	rac
185		H	A7	C ₁₆ H ₁₆ N ₄ O ₃ S	344.39	N/A
186		H	A7	C ₁₅ H ₁₃ N ₅ O ₂ S	327.36	rac
187		H	A7	C ₁₆ H ₁₅ N ₅ O ₂ S	341.39	rac
188		H	A7	C ₁₇ H ₁₇ N ₅ O ₂ S	355.42	rac
189		H	A7	C ₁₆ H ₁₅ N ₅ O ₂ S	341.39	(3 <i>R</i>)
190		H	A7	C ₁₇ H ₁₇ N ₅ O ₂ S	355.42	rac
191		H	A7	C ₁₆ H ₁₅ N ₅ O ₂ S	341.39	rac
192		H	A7	C ₁₇ H ₁₇ N ₅ O ₂ S	355.42	rac
192A		H	A7	C ₁₇ H ₁₇ N ₅ O ₂ S	355.42	Enantiomer A (3 <i>R</i>) or (3 <i>S</i>)
192B		H	A7	C ₁₇ H ₁₇ N ₅ O ₂ S	355.42	Enantiomer B (3 <i>R</i>) or (3 <i>S</i>)

						
Cpd N°	R ¹ -NH-	R ²	Class	Formula	MW	Stereochemistry
193		H	A7	C ₁₆ H ₁₆ N ₄ O ₃ S	344.39	(3 <i>S</i> ,4 <i>S</i>)
194		H	A1	C ₂₀ H ₂₀ N ₄ OS	364.47	N/A
195		H	A1	C ₂₆ H ₃₁ N ₅ O ₃ S	493.63	N/A
196		H	A1	C ₂₁ H ₂₁ FN ₄ OS	396.48	N/A
197		H	A1	C ₂₁ H ₂₈ N ₄ O ₂ S	400.54	(1 <i>R</i>)
198		H	A2	C ₂₃ H ₂₄ N ₄ O ₂ S	420.53	(1 <i>R</i>)
199		H	A1	C ₂₃ H ₂₅ N ₅ O ₂ S	435.55	N/A
200		H	A1	C ₂₅ H ₂₇ N ₅ O ₂ S	461.58	N/A
201		H	A1	C ₂₂ H ₂₅ N ₅ O ₃ S ₂	471.59	N/A
202		H	A1	C ₂₄ H ₂₇ N ₅ O ₃ S ₂	497.63	N/A

						
Cpd N°	R ¹ -NH-	R ²	Class	Formula	MW	Stereochemistry
203		H	A1	C ₂₃ H ₂₇ N ₅ OS	421.56	N/A
204		H	A1	C ₂₃ H ₂₄ N ₄ O ₃ S	436.53	N/A
205		Me	A1	C ₁₈ H ₂₀ N ₄ OS	340.45	N/A
206		Me	A1	C ₁₉ H ₂₂ N ₄ OS	354.47	N/A
207		Me	A1	C ₁₉ H ₂₄ N ₄ O ₂ S	372.49	(1 <i>R</i>)
208		Me	A2	C ₂₁ H ₂₀ N ₄ O ₂ S	392.48	(1 <i>R</i>)
209		Me	A1	C ₂₂ H ₂₄ N ₄ OS	392.52	N/A
210		Me	A1	C ₂₂ H ₂₄ N ₄ O ₂ S	408.52	N/A
211		H	A1	C ₂₁ H ₂₂ N ₄ O ₃ S	410.49	N/A
212		H	A1	C ₂₁ H ₁₉ F ₃ N ₄ OS	432.47	N/A
213		H	A1	C ₁₉ H ₂₄ N ₄ O ₂ S	372.49	(1 <i>R</i>)
214		H	A1	C ₂₄ H ₂₆ N ₄ O ₂ S	434.56	(1 <i>R</i>)

Cpd N°	R¹-NH-	R²	Class	Formula	MW	Stereochemistry
215		H	A1	C ₂₄ H ₂₅ FN ₄ O ₂ S	452.55	(1 <i>R</i>)
216		H	A1	C ₂₀ H ₂₄ N ₄ O ₂ S	384.50	(1 <i>R</i>)

The below Table 3 describes the analytical and spectroscopic data of the compounds introduced in Table 2.

¹H NMR analyses (400 or 500 MHz) and ¹³C NMR spectra (101 MHz) were recorded with a Bruker ULTRASHIELD 500 or 400 spectrometer. Processing and analyses of the spectra were performed with MestReNova. Data appear in the following order: chemical shifts in ppm which were referenced to the internal solvent signal, multiplicity, number of protons, and coupling constant *J* in Hertz.

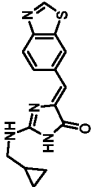
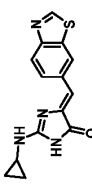
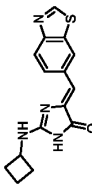
Reversed-phase HPLC/MS analyses were carried out with a Waters Alliance 2795 HPLC equipped with an autosampler, an inline membrane degasser, a column oven (T = 45 °C), a UV detector, and a ZQ quadrupole mass detector working in ionization electrospray mode. Compounds (0.1 to 0.3 mg) were solubilized in a minimum amount of DMSO completed with acetonitrile (V_{total} = 1 mL). Standard analytical parameters: flow rate: 1mL/min, V_{inj.} = 5μL.

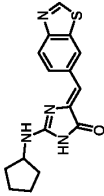
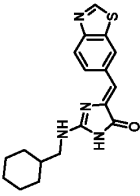
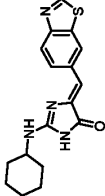
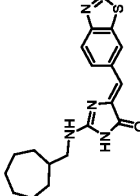
- Acidic conditions: Waters XSelect CSH C18 column (3.5μm, 2.1 x 50 mm). Gradient: (H₂O + 0.04% v/v HCOOH (10mM))/ACN from 95/5 to 0/100 in 18.5 min.

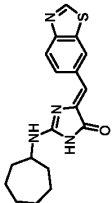
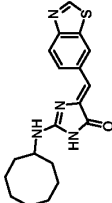
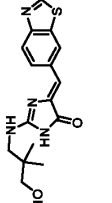
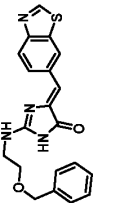
- Alkaline conditions: Waters Xbridge C18 column (3.5μm, 2.1 x 50 mm). Gradient: (H₂O + 0.06% v/v NH_{3(aq)} (10mM))/ACN from 95/5 to 0/100 in 18.5 min.

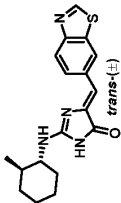
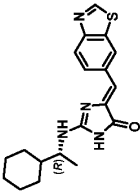
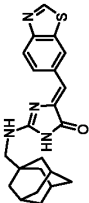
Enantiomers of racemic products (149), (169), (171) and (192) were separated by Reach Separations (Bio City, Pennyfoot St., Nottingham, NG1 1GF, UK. www.reachseparations.com) by preparative chiral SFC. Briefly: racemic products were solubilized in MeOH and purified by preparative SFC (conditions in Table 3). Combined fractions containing the first eluting enantiomer were then evaporated to near dryness using a rotary evaporator, transferred into final vessels with DCM which was removed on a Biotage V10 at 35 °C before being stored in a vacuum oven at 35 °C and 5 mbar until constant weight to afford the pure enantiomer. Fractions containing the second eluting enantiomer were combined, concentrated and repurified as described above. The optical purity of each enantiomer was controlled with respect to the racemate by analytical chiral SFC (conditions in Table 3). Chemical purity of each enantiomer was controlled by analytical UHPLC on an Acquity BEH C18 (1.7μm, 50 x 2.1 mm) (60 °C, 1 mL/min, inj. vol. = 1 μL), gradient: (H₂O + 0.1% v/v TFA)/ACN from 98/2 to 0/100 in 2.02 min.

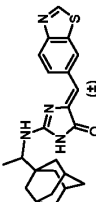
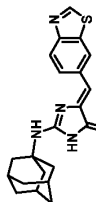
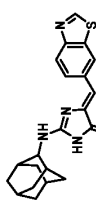
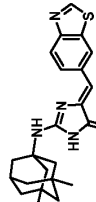
Table 3. Spectroscopic and analytical characterization of compounds (1) to (216)

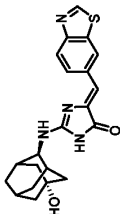
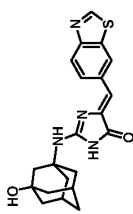
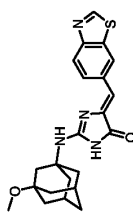
Cpd N°	Structure	Formula	MW	HPLC	Description
1		C ₁₅ H ₁₄ N ₄ OS	298.36	>98%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 300K) of major tautomer δ _H 10.66 (br s, 1H, NH, D ₂ O exchanged), 9.35 (s, 1H), 8.80 (s, 1H), 8.39 – 8.13 (m, 1H), 8.03 (d, <i>J</i> = 8.6 Hz, 1H), 7.56 (br s, 1H, NH, D ₂ O exchanged), 6.40 (s, 1H), 3.32 – 3.10 (m, 2H), 1.18 – 1.02 (m, 1H), 0.57 – 0.41 (m, 2H), 0.38 – 0.23 (m, 2H). MS (ESI ⁺) : [M+H] ⁺ 299.2.
2		C ₁₄ H ₁₂ N ₄ OS	284.34	>98%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 300K) of major tautomer δ _H 11.13 (br s, 1H, NH, D ₂ O exchanged), 9.35 (s, 1H), 8.83 (s, 1H), 8.26 (d, <i>J</i> = 8.6 Hz, 1H), 8.13 (br s, 1H, NH, D ₂ O exchanged), 8.03 (d, <i>J</i> = 8.6 Hz, 1H), 6.43 (s, 1H), 3.04 – 2.62 (m, 1H), 0.83 – 0.69 (m, 2H), 0.68 – 0.54 (m, 2H). MS (ESI ⁺) : [M+H] ⁺ 285.1.
3		C ₁₅ H ₁₄ N ₄ OS	298.36	>98%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 300K) of major tautomer δ _H 10.72 (br s, 1H, NH, D ₂ O exchanged), 9.36 (s, 1H), 8.79 (s, 1H), 8.34 – 8.22 (m, 1H), 8.04 (d, <i>J</i> = 8.6 Hz, 1H), 7.83 (br s, 1H, NH, D ₂ O exchanged), 6.40 (s, 1H), 4.74 – 4.02 (m, 1H), 2.38 – 2.20 (m, 2H), 2.17 – 1.97 (m, 2H), 1.69 (s, 2H). MS (ESI ⁺) : [M+H] ⁺ 299.2.

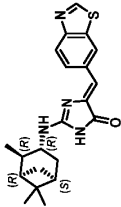
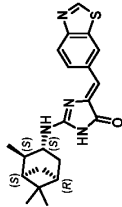
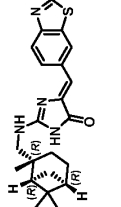
Cpd N ^o	Structure	Formula	MW	HPLC	Description
4		C ₁₆ H ₁₆ N ₄ OS	312.39	>98%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 300K) of major tautomer δ _H 10.53 (br s, 1H, NH, D ₂ O exchanged), 9.36 (s, 1H), 8.76 (s, 1H), 8.22 (s, 1H), 8.04 (d, <i>J</i> = 8.0 Hz, 1H), 7.84 (br s, 1H, NH, D ₂ O exchanged), 6.41 (s, 1H), 4.43 – 4.05 (m, 1H), 2.04 – 1.92 (m, 2H), 1.76 – 1.67 (m, 2H), 1.56 (m, 2H), 1.40 (m, 2H). MS (ESI ⁺) : [M+H] ⁺ 313.2.
5		C ₁₈ H ₂₀ N ₄ OS	340.45	97%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 300K) of major tautomer δ _H 10.57 (br s, 1H, NH, D ₂ O exchanged), 9.35 (s, 1H), 8.85 (s, 1H), 8.23 (d, <i>J</i> = 8.5 Hz, 1H), 8.03 (d, <i>J</i> = 8.5 Hz, 1H), 7.50 (br s, 1H, NH, D ₂ O exchanged), 6.38 (s, 1H), 3.28 – 3.00 (m, 2H), 1.83 – 1.49 (m, 6H), 1.35 – 1.09 (m, 3H), 1.08 – 0.82 (m, 2H). MS (ESI ⁺) : [M+H] ⁺ 341.2.
6		C ₁₇ H ₁₈ N ₄ OS	326.42	>98%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 300K) of major tautomer δ _H 10.62 (br s, 1H, NH, D ₂ O exchanged), 9.35 (s, 1H), 8.90 – 8.65 (m, 1H), 8.37 – 8.13 (m, 1H), 8.03 (d, <i>J</i> = 8.4 Hz, 1H), 7.49 (br s, 1H, NH, D ₂ O exchanged), 6.39 (s, 1H), 3.97 – 3.46 (m, 1H), 2.07 – 1.80 (m, 2H), 1.80 – 1.65 (m, 2H), 1.65 – 1.53 (m, 1H), 1.49 – 1.05 (m, 5H). MS (ESI ⁺) : [M+H] ⁺ 327.2.
7		C ₁₉ H ₂₂ N ₄ OS	354.47	>98%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 300K) of major tautomer δ _H 10.61 (br s, 1H, NH, D ₂ O exchanged), 9.35 (s, 1H), 8.88 (s, 1H), 8.22 (d, <i>J</i> = 8.6 Hz, 1H), 8.03 (d, <i>J</i> = 8.5 Hz, 1H), 7.53 (br s, 1H, NH, D ₂ O exchanged), 6.39 (s, 1H), 3.29 – 3.02 (m, 2H), 1.95 – 1.36 (m, 11H), 1.33 – 1.12 (m, 2H). MS (ESI ⁺) : [M+H] ⁺ 355.2.

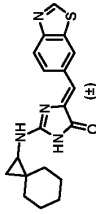
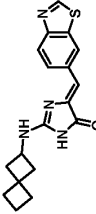
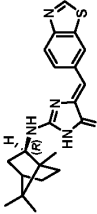
Cpd N°	Structure	Formula	MW	HPLC	Description
8		C ₁₈ H ₂₀ N ₄ O ₂ S	340.45	>98%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 300K) of major tautomer δ _H 10.40 (br s, 1H, NH, D ₂ O exchanged), 9.35 (s, 1H), 9.05 – 8.69 (m, 1H), 8.42 – 8.13 (m, 1H), 8.03 (d, <i>J</i> = 8.5 Hz, 1H), 7.54 (br s, 1H, NH, D ₂ O exchanged), 6.39 (s, 1H), 3.98 (s, 1H), 1.93 (s, 2H), 1.78 – 1.35 (m, 10H). MS (ESI ⁺): [M+H] ⁺ 341.2.
9		C ₁₉ H ₂₂ N ₄ O ₂ S	354.47	>98%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 300K) of major tautomer δ _H 10.43 (br s, 1H, NH, D ₂ O exchanged), 9.35 (s, 1H), 8.98 (m, 1H), 8.18 (d, <i>J</i> = 8.6 Hz, 1H), 8.02 (d, <i>J</i> = 8.5 Hz, 1H), 7.56 (br s, 1H, NH, D ₂ O exchanged), 6.40 (s, 1H), 4.25 – 3.91 (m, 1H), 1.94 – 1.35 (m, 14H). MS (ESI ⁺): [M+H] ⁺ 355.2.
10		C ₁₆ H ₁₈ N ₄ O ₂ S	330.41	>98%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 300K) of major tautomer δ _H 10.59 (br s, 1H, NH, D ₂ O exchanged), 9.37 (s, 1H), 8.82 – 8.62 (m, 1H), 8.22 (d, <i>J</i> = 8.6 Hz, 1H), 8.04 (d, <i>J</i> = 8.6 Hz, 1H), 7.45 (br s, 1H, NH, D ₂ O exchanged), 6.43 (br s, 1H, OH, D ₂ O exchanged), 5.02 (s, 1H), 3.33 – 3.24 (m, 2H), 3.22 – 3.11 (m, 2H), 1.09 – 0.65 (m, 6H). MS (ESI ⁺): [M+H] ⁺ 331.2.
11		C ₂₀ H ₁₈ N ₄ O ₂ S	378.45	>98%	Yellow solid. ¹ H NMR (500 MHz, DMSO- <i>d</i> ₆ , 300K) of major tautomer δ _H 10.62 (s, 1H, NH, D ₂ O exchanged), 9.35 (s, 1H), 8.82 (s, 1H), 8.39 – 8.25 (m, 1H), 8.03 (d, <i>J</i> = 8.5 Hz, 1H), 7.72 – 7.42 (m, 1H), 7.40 – 7.20 (m, 5H), 6.42 (s, 1H), 4.61 – 4.50 (m, 2H), 3.88 – 3.47 (m, 4H). MS (ESI ⁺): [M+H] ⁺ 379.2.

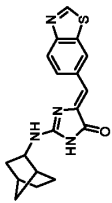
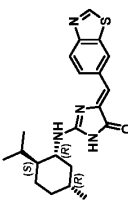
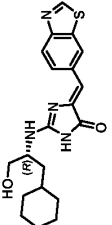
Cpd N°	Structure	Formula	MW	HPLC	Description
12		C ₁₈ H ₂₀ N ₄ O ₂ S	340.45	>98%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 300K) of major tautomer δ _H 10.49 (br s, 1H, NH, D ₂ O exchanged), 9.34 (s, 1H), 8.92 – 8.69 (m, 1H), 8.27 – 8.15 (m, 1H), 8.02 (d, <i>J</i> = 8.6 Hz, 1H), 7.42 (br s, 1H, NH, D ₂ O exchanged), 6.36 (s, 1H), 3.65 – 3.34 (m, 1H), 3.23 – 2.84 (m, 1H), 2.01 – 1.13 (m, 8H), 0.98 – 0.84 (m, 3H). MS (ESI ⁺) : [M+H] ⁺ 341.2.
13		C ₁₉ H ₂₂ N ₄ O ₂ S	354.47	>97%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 300K) of major tautomer δ _H 10.34 (br s, 1H, NH, D ₂ O exchanged), 9.34 (d, <i>J</i> = 1.4 Hz, 1H), 8.92 – 8.73 (m, 1H), 8.26 – 8.18 (m, 1H), 8.03 (d, <i>J</i> = 8.5 Hz, 1H), 7.37 (br s, 1H, NH, D ₂ O exchanged), 6.37 (s, 1H), 4.12 – 3.39 (m, 1H), 1.72 (d, <i>J</i> = 13.8 Hz, 4H), 1.65 – 1.57 (m, 1H), 1.46 (s, 1H), 1.26 – 0.96 (m, 8H). MS (ESI ⁺) : [M+H] ⁺ 355.2.
14		C ₂₂ H ₂₄ N ₄ O ₂ S	392.17	>98%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 300K) of major tautomer δ _H 10.33 (br s, 1H, NH, D ₂ O exchanged), 9.35 (s, 1H), 8.85 (s, 1H), 8.35 – 8.14 (m, 1H), 8.03 (d, <i>J</i> = 8.5 Hz, 1H), 7.41 (br s, 1H, NH, D ₂ O exchanged), 6.38 (s, 1H), 3.25 – 2.80 (m, 2H), 1.96 (s, 3H), 1.72 – 1.43 (m, 12H). MS (ESI ⁺) : [M+H] ⁺ 393.3.

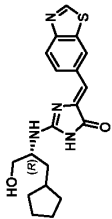
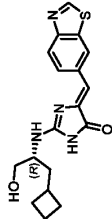
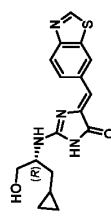
Cpd N°	Structure	Formula	MW	HPLC	Description
15		C ₂₃ H ₂₆ N ₄ OS	406.55	>98%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 343K) of major tautomer δ _H 10.22 (br s, 1H, NH, D ₂ O exchanged), 9.30 (s, 1H), 8.82 (s, 1H), 8.22 (d, <i>J</i> = 8.8 Hz, 1H), 8.02 (d, <i>J</i> = 8.6 Hz, 1H), 7.14 (br s, 1H, NH, D ₂ O exchanged), 6.39 (s, 1H), 3.76 – 3.59 (m, 1H), 1.99 (s, 3H), 1.77 – 1.49 (m, 12H), 1.17 – 1.05 (m, 3H). MS (ESI ⁺) : [M+H] ⁺ 407.3.
16		C ₂₁ H ₂₂ N ₄ OS	378.49	95%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 300K) of major tautomer δ _H 9.99 (br s, 1H, D ₂ O exchanged), 9.35 (s, 1H), 9.02 (s, 1H), 8.17 – 8.13 (m, 1H), 8.03 (d, <i>J</i> = 8.5 Hz, 1H), 7.09 (br s, 1H, D ₂ O exchanged), 6.42 (s, 1H), 2.26 – 2.02 (m, 10H), 1.80 – 1.64 (m, 5H). MS (ESI ⁺) : [M+H] ⁺ 379.2.
17		C ₂₁ H ₂₂ N ₄ OS	378.49	93%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 343K) of major tautomer δ _H 10.06 (br s, 1H, D ₂ O exchanged), 9.31 (s, 1H), 8.87 (s, 1H), 8.20 (d, <i>J</i> = 8.7 Hz, 1H), 8.01 (d, <i>J</i> = 8.5 Hz, 1H), 7.35 (br s, 1H, D ₂ O exchanged), 6.44 (s, 1H), 4.15 – 3.95 (m, 1H), 2.13 – 1.56 (m, 14H). MS (ESI ⁺) : [M+H] ⁺ 379.2.
18		C ₂₃ H ₂₆ N ₄ OS	406.55	97%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 300K) of major tautomer δ _H 10.04 (br s, 1H, NH, D ₂ O exchanged), 9.35 (s, 1H), 9.17 (s, 1H), 8.02 (s, 2H), 7.16 (br s, 1H, NH, D ₂ O exchanged), 6.41 (s, 1H), 2.23 – 2.13 (m, 1H), 2.02 – 1.70 (m, 6H), 1.49 – 1.28 (m, 4H), 1.25 – 1.14 (m, 2H), 0.98 – 0.85 (m, 6H). MS (ESI ⁺) : [M+H] ⁺ 407.2.

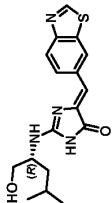
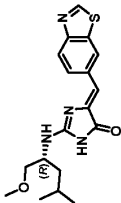
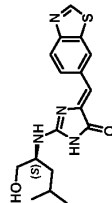
Cpd N°	Structure	Formula	MW	HPLC	Description
19		C ₂₁ H ₂₂ N ₄ O ₂ S	394.49	>98%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 300K) of major tautomer δ _H 9.93 (br s, 1H, NH, D ₂ O exchanged), 9.36 (s, 1H), 8.98 – 8.76 (m, 1H), 8.37 – 8.11 (m, 1H), 8.11 – 7.97 (m, 1H), 7.48 (br s, 1H, NH, D ₂ O exchanged), 6.42 (s, 1H), 4.57 – 4.36 (br s, 1H, OH, D ₂ O exchanged), 4.20 – 3.78 (m, 1H), 2.25 – 2.00 (m, 3H), 1.97 – 1.74 (m, 4H), 1.72 – 1.60 (m, 4H), 1.49 – 1.32 (m, 2H). MS (ESI ⁺) : [M+H] ⁺ 395.2.
20		C ₂₁ H ₂₂ N ₄ O ₂ S	394.49	97%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 300K) of major tautomer δ _H 10.01 (br s, 1H, NH, D ₂ O exchanged), 9.35 (s, 1H), 9.00 (s, 1H), 8.15 (dd, <i>J</i> = 8.6, 1.6 Hz, 1H), 8.02 (d, <i>J</i> = 8.5 Hz, 1H), 7.17 (br s, 1H, NH, D ₂ O exchanged), 6.42 (s, 1H), 4.62 (br s, 1H, OH, D ₂ O exchanged), 2.28 – 2.17 (m, 2H), 2.12 – 2.01 (m, 5H), 1.99 – 1.91 (m, 1H), 1.69 – 1.45 (m, 6H). MS (ESI ⁺) : [M+H] ⁺ 395.2.
21		C ₂₂ H ₂₄ N ₄ O ₂ S	408.52	96%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 300K) of major tautomer δ _H 10.08 (br s, 1H, NH, D ₂ O exchanged), 9.35 (s, 1H), 9.04 (s, 1H), 8.12 (d, <i>J</i> = 8.6 Hz, 1H), 8.02 (d, <i>J</i> = 8.6 Hz, 1H), 7.27 (br s, 1H, NH, D ₂ O exchanged), 6.43 (s, 1H), 3.18 (s, 3H), 2.38 – 1.91 (m, 8H), 1.83 – 1.47 (m, 6H). MS (ESI ⁺) : [M+H] ⁺ 409.3.

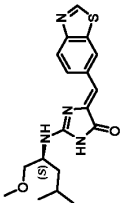
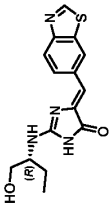
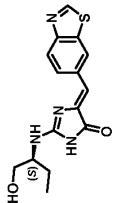
Cpd N°	Structure	Formula	MW	HPLC	Description
22		C ₂₁ H ₂₄ N ₄ OS	380.51	95%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 300K) of major tautomer δ _H 10.64 (br s, 1H, NH, D ₂ O exchanged), 9.34 (s, 1H), 9.12 – 8.81 (m, 1H), 8.17 (d, <i>J</i> = 8.6 Hz, 1H), 8.01 (d, <i>J</i> = 8.5 Hz, 1H), 7.71 (br s, 1H, NH, D ₂ O exchanged), 6.39 (s, 1H), 4.57 – 4.23 (m, 1H), 3.98 – 3.66 (m, 1H), 2.64 – 2.52 (m, 1H), 2.40 – 2.28 (m, 1H), 2.21 – 2.04 (m, 1H), 2.04 – 1.87 (m, 1H), 1.87 – 1.61 (m, 2H), 1.38 – 0.89 (m, 9H). MS (ESI ⁺) : [M+H] ⁺ 381.2.
23		C ₂₁ H ₂₄ N ₄ OS	380.51	95%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 300K) of major tautomer δ _H 10.64 (br s, 1H, NH, D ₂ O exchanged), 9.34 (s, 1H), 9.12 – 8.81 (m, 1H), 8.17 (d, <i>J</i> = 8.6 Hz, 1H), 8.01 (d, <i>J</i> = 8.5 Hz, 1H), 7.71 (br s, 1H, NH, D ₂ O exchanged), 6.39 (s, 1H), 4.57 – 4.23 (m, 1H), 3.98 – 3.66 (m, 1H), 2.64 – 2.52 (m, 1H), 2.40 – 2.28 (m, 1H), 2.21 – 2.04 (m, 1H), 2.04 – 1.87 (m, 1H), 1.87 – 1.61 (m, 2H), 1.38 – 0.89 (m, 9H). MS (ESI ⁺) : [M+H] ⁺ 381.2.
24		C ₂₁ H ₂₄ N ₄ OS	380.51	94%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 343K) of major tautomer δ _H 10.51 (br s, 1H, NH, D ₂ O exchanged), 9.30 (s, 1H), 8.95 (s, 1H), 8.14 (d, <i>J</i> = 8.7 Hz, 1H), 7.99 (d, <i>J</i> = 8.5 Hz, 1H), 7.36 (br s, 1H, NH, D ₂ O exchanged), 6.40 (s, 1H), 3.54 – 3.35 (m, 2H), 2.42 – 2.29 (m, 2H), 2.09 – 1.80 (m, 5H), 1.72 – 1.58 (m, 1H), 1.20 (s, 6H), 0.92 (d, <i>J</i> = 9.5 Hz, 1H). MS (ESI ⁺) : [M+H] ⁺ 381.2.

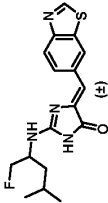
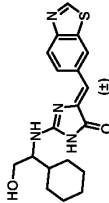
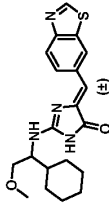
Cpd N°	Structure	Formula	MW	HPLC	Description
25		$C_{19}H_{20}N_4OS$	352.46	>98%	Yellow solid. 1H NMR (400 MHz, DMSO- d_6 , 300K) of major tautomer δ_H 10.68 (br s, 1H, NH, D ₂ O exchanged), 9.35 (s, 1H), 9.14 – 8.80 (m, 1H), 8.16 (d, J = 8.6 Hz, 1H), 8.01 (d, J = 8.5 Hz, 1H), 7.67 (br s, 1H, NH, D ₂ O exchanged), 6.43 (s, 1H), 2.72 – 2.58 (m, 1H), 1.92 – 1.20 (m, 10H), 0.71 (dd, J = 7.9, 5.1 Hz, 1H), 0.55 (t, J = 4.7 Hz, 1H). MS (ESI ⁺) : [M+H] ⁺ 353.2.
26		$C_{18}H_{18}N_4OS$	338.43	>98%	Yellow solid. 1H NMR (400 MHz, DMSO- d_6 , 300K) of major tautomer δ_H 10.71 (br s, 1H, NH, D ₂ O exchanged), 9.35 (s, 1H), 8.80 (s, 1H), 8.32 – 8.17 (m, 1H), 8.03 (d, J = 8.6 Hz, 1H), 7.75 (br s, 1H, NH, D ₂ O exchanged), 6.39 (s, 1H), 4.61 – 3.67 (m, 2H), 2.45 – 2.32 (m, 2H), 2.16 – 1.99 (m, 3H), 1.99 – 1.88 (m, 2H), 1.87 – 1.74 (m, 2H). MS (ESI ⁺) : [M+H] ⁺ 339.2.
27		$C_{21}H_{24}N_4OS$	380.51	96%	Yellow solid. 1H NMR (400 MHz, DMSO- d_6 , 300K) of major tautomer δ_H 10.19 (br s, 1H, NH, D ₂ O exchanged), 9.34 (s, 1H), 8.92 (s, 1H), 8.19 (dd, J = 8.7, 1.6 Hz, 1H), 8.01 (d, J = 8.6 Hz, 1H), 7.58 (br s, 1H, NH, D ₂ O exchanged), 6.38 (s, 1H), 4.50 – 3.70 (m, 1H), 2.39 – 2.17 (m, 1H), 1.67 (s, 3H), 1.42 – 1.20 (m, 2H), 1.14 – 0.61 (m, 10H). MS (ESI ⁺) : [M+H] ⁺ 381.2.

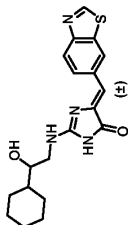
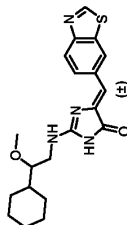
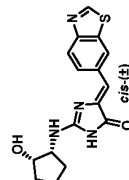
Cpd N°	Structure	Formula	MW	HPLC	Description
28		C ₁₈ H ₁₈ N ₄ OS	338.43	>98%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 300K) of major tautomer δ _H 10.30 (br s, 1H, NH, D ₂ O exchanged), 9.35 (s, 1H), 8.97 – 8.71 (m, 1H), 8.40 – 8.20 (m, 1H), 8.04 (d, <i>J</i> = 8.6 Hz, 1H), 7.65 (br s, 1H, NH, D ₂ O exchanged), 6.40 (s, 1H), 4.30 – 3.71 (m, 1H), 2.47 – 2.34 (m, 1H), 2.27 – 2.12 (m, 1H), 2.08 – 1.86 (m, 1H), 1.74 – 1.25 (m, 6H), 1.18 – 1.02 (m, 1H). MS (ESI ⁺) : [M+H] ⁺ 339.2
29		C ₂₁ H ₂₆ N ₄ OS	382.53	91%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 300K) of major tautomer δ _H 10.52 (br s, 1H, NH, D ₂ O exchanged), 9.34 (s, 1H), 8.84 (s, 1H), 8.27 – 8.15 (m, 1H), 8.01 (d, <i>J</i> = 8.6 Hz, 1H), 7.37 (br s, 1H, NH, D ₂ O exchanged), 6.36 (s, 1H), 3.97 – 3.66 (m, 1H), 2.11 – 1.20 (m, 7H), 1.19 – 0.58 (m, 11H) MS (ESI ⁺) : [M+H] ⁺ 383.3.
30		C ₂₀ H ₂₄ N ₄ O ₂ S	384.50	96%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 373K) of major tautomer δ _H 10.07 (br s, 1H, NH, D ₂ O exchanged), 9.28 (s, 1H), 9.03 – 8.63 (m, 1H), 8.35 – 8.04 (m, 1H), 8.04 – 7.90 (m, 1H), 6.90 (br s, 1H, NH, D ₂ O exchanged), 6.42 (s, 1H), 4.54 (br s, 1H, OH, D ₂ O exchanged), 4.14 – 3.93 (m, 1H), 3.66 – 3.44 (m, 2H), 1.95 – 0.90 (m, 13H). MS (ESI ⁺) : [M+H] ⁺ 385.2.

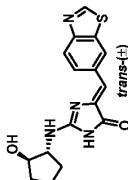
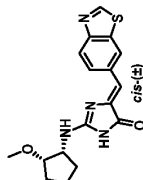
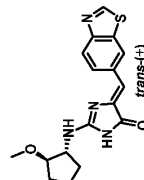
Cpd N°	Structure	Formula	MW	HPLC	Description
31		C ₁₉ H ₂₂ N ₄ O ₂ S	370.47	>98%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 373K) of major tautomer δ _H 10.11 (br s, 1H, NH, D ₂ O exchanged), 9.28 (s, 1H), 9.03 – 8.85 (m, 1H), 8.28 – 8.09 (m, 1H), 8.07 – 7.95 (m, 1H), 6.91 (br s, 1H, NH, D ₂ O exchanged), 6.43 (s, 1H), 4.55 (br s, 1H, OH, D ₂ O exchanged), 4.08 – 3.86 (m, 1H), 3.66 – 3.44 (m, 2H), 1.99 – 1.08 (m, 11H). MS (ESI ⁺) : [M+H] ⁺ 371.2.
32		C ₁₈ H ₂₀ N ₄ O ₂ S	356.44	>98%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 300K) of major tautomer δ _H 10.38 (br s, 1H, NH, D ₂ O exchanged), 9.35 (s, 1H), 9.03 – 8.72 (m, 1H), 8.19 (d, <i>J</i> = 8.7 Hz, 1H), 8.01 (d, <i>J</i> = 8.5 Hz, 1H), 7.22 (br s, 1H, NH, D ₂ O exchanged), 6.40 (s, 1H), 4.86 (br s, 1H, OH, D ₂ O exchanged), 4.14 – 3.75 (m, 1H), 3.71 – 3.39 (m, 2H), 2.44 – 2.30 (m, 1H), 2.18 – 1.92 (m, 2H), 1.88 – 1.45 (m, 6H). MS (ESI ⁺) : [M+H] ⁺ 357.2.
33		C ₁₇ H ₁₈ N ₄ O ₂ S	342.2	>98%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 323K) of major tautomer δ _H 10.37 (br s, 1H, NH, D ₂ O exchanged), 9.33 (s, 1H), 8.98 – 8.72 (m, 1H), 8.34 – 8.12 (m, 1H), 8.02 (d, <i>J</i> = 8.5 Hz, 1H), 7.23 (br s, 1H, NH, D ₂ O exchanged), 6.41 (s, 1H), 4.77 (br s, 1H, OH, D ₂ O exchanged), 4.11 – 3.87 (m, 1H), 3.70 – 3.44 (m, 2H), 1.69 – 1.51 (m, 1H), 1.51 – 1.40 (m, 1H), 0.87 – 0.71 (m, 1H), 0.52 – 0.37 (m, 2H), 0.25 – 0.03 (m, 2H). MS (ESI ⁺) : [M+H] ⁺ 343.1.

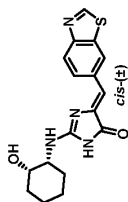
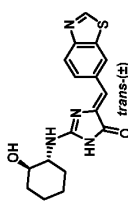
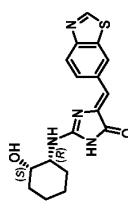
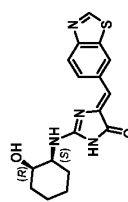
Cpd N°	Structure	Formula	MW	HPLC	Description
34		C ₁₇ H ₂₀ N ₄ O ₂ S	344.43	>98%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 300K) of major tautomer δ _H 10.42 (br s, 1H, NH, D ₂ O exchanged), 9.35 (s, 1H), 8.92 (s, 1H), 8.19 (d, <i>J</i> = 8.7 Hz, 1H), 8.01 (d, <i>J</i> = 8.6 Hz, 1H), 7.26 (br s, 1H, NH, D ₂ O exchanged), 6.40 (s, 1H), 4.87 (br s, 1H, OH, D ₂ O exchanged), 4.34 – 4.04 (m, 1H), 3.62 – 3.42 (m, 2H), 1.86 – 1.57 (m, 1H), 1.60 – 1.34 (m, 2H), 1.15 – 0.77 (m, 6H). MS (ESI ⁺) : [M+H] ⁺ 345.2.
35		C ₁₈ H ₂₂ N ₄ O ₂ S	358.46	>98%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 373K) of major tautomer δ _H 10.16 (br s, 1H, NH, D ₂ O exchanged), 9.27 (s, 1H), 8.89 (s, 1H), 8.15 (d, <i>J</i> = 8.6 Hz, 1H), 7.99 (d, <i>J</i> = 8.4 Hz, 1H), 7.01 (br s, 1H, NH, D ₂ O exchanged), 6.43 (s, 1H), 4.19 (s, 1H), 3.53 – 3.41 (m, 2H), 3.34 (s, 3H), 1.83 – 1.66 (m, 1H), 1.62 – 1.39 (m, 2H), 1.14 – 0.81 (m, 6H). MS (ESI ⁺) : [M+H] ⁺ 359.2.
36		C ₁₇ H ₂₀ N ₄ O ₂ S	344.43	>98%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 300K) of major tautomer δ _H 10.42 (br s, 1H, NH, D ₂ O exchanged), 9.35 (s, 1H), 8.92 (s, 1H), 8.19 (d, <i>J</i> = 8.7 Hz, 1H), 8.01 (d, <i>J</i> = 8.6 Hz, 1H), 7.26 (br s, 1H, NH, D ₂ O exchanged), 6.40 (s, 1H), 4.87 (br s, 1H, OH, D ₂ O exchanged), 4.34 – 4.04 (m, 1H), 3.62 – 3.42 (m, 2H), 1.86 – 1.57 (m, 1H), 1.60 – 1.34 (m, 2H), 1.15 – 0.77 (m, 6H). MS (ESI ⁺) : [M+H] ⁺ 345.2.

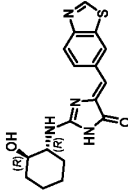
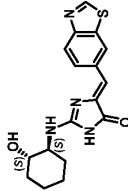
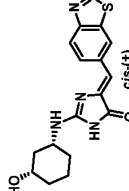
Cpd N°	Structure	Formula	MW	HPLC	Description
37		C ₁₈ H ₂₂ N ₄ O ₂ S	358.46	>98%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 373K) of major tautomer δ _H 10.16 (br s, 1H, NH, D ₂ O exchanged), 9.27 (s, 1H), 8.89 (s, 1H), 8.15 (d, <i>J</i> = 8.6 Hz, 1H), 7.99 (d, <i>J</i> = 8.4 Hz, 1H), 7.01 (br s, 1H, NH, D ₂ O exchanged), 6.43 (s, 1H), 4.19 (s, 1H), 3.53 – 3.41 (m, 2H), 3.34 (s, 3H), 1.83 – 1.66 (m, 1H), 1.62 – 1.39 (m, 2H), 1.14 – 0.81 (m, 6H). MS (ESI ⁺) : [M+H] ⁺ 359.2.
38		C ₁₅ H ₁₆ N ₄ O ₂ S	316.38	88%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 333K) of major tautomer δ _H 10.41 (br s, 1H, NH, D ₂ O exchanged), 9.32 (s, 1H), 8.81 (s, 1H), 8.23 (d, <i>J</i> = 8.7 Hz, 1H), 8.02 (d, <i>J</i> = 8.7 Hz, 1H), 7.19 (br s, 1H, NH, D ₂ O exchanged), 6.41 (s, 1H), 4.89 – 4.62 (m, 1H, OH, D ₂ O exchanged), 3.81 (s, 1H), 3.53 (s, 2H), 1.76 – 1.62 (m, 1H), 1.62 – 1.45 (m, 1H), 1.00 – 0.87 (m, 3H). MS (ESI ⁺) : [M+H] ⁺ 317.5.
39		C ₁₅ H ₁₆ N ₄ O ₂ S	316.38	>96%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 333K) of major tautomer δ _H 10.41 (br s, 1H, NH, D ₂ O exchanged), 9.32 (s, 1H), 8.81 (s, 1H), 8.23 (d, <i>J</i> = 8.7 Hz, 1H), 8.02 (d, <i>J</i> = 8.7 Hz, 1H), 7.19 (br s, 1H, NH, D ₂ O exchanged), 6.41 (s, 1H), 4.86 (br s, 1H, OH, D ₂ O exchanged), 3.81 (s, 1H), 3.53 (s, 2H), 1.76 – 1.62 (m, 1H), 1.62 – 1.45 (m, 1H), 1.00 – 0.87 (m, 3H). MS (ESI ⁺) : [M+H] ⁺ 317.5.

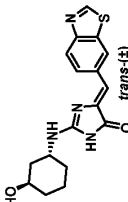
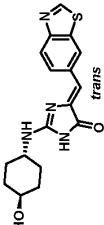
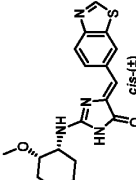
Cpd N°	Structure	Formula	MW	HPLC	Description
40		C ₁₇ H ₁₉ FN ₄ O ₂ S	346.42	91%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 373K) of major tautomer δ _H 10.28 (br s, 1H, NH, D ₂ O exchanged), 9.28 (s, 1H), 8.85 (s, 1H), 8.17 (d, <i>J</i> = 8.2 Hz, 1H), 8.00 (d, <i>J</i> = 8.5 Hz, 1H), 7.25 (br s, 1H, NH, D ₂ O exchanged), 6.46 (s, 1H), 4.64 – 4.52 (m, 1H), 4.50 – 4.40 (m, 1H), 4.37 – 4.22 (m, 1H), 1.84 – 1.71 (m, 1H), 1.65 – 1.55 (m, 1H), 1.52 – 1.41 (m, 1H), 1.04 – 0.81 (m, 6H). MS (ESI ⁺) : [M+H] ⁺ 347.2.
41		C ₁₉ H ₂₂ N ₄ O ₂ S	370.47	>98%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 343K) of major tautomer δ _H 10.26 (br s, 1H, NH, D ₂ O exchanged), 9.31 (s, 1H), 8.84 (s, 1H), 8.20 (d, <i>J</i> = 8.7 Hz, 1H), 8.02 (d, <i>J</i> = 8.6 Hz, 1H), 7.11 (br s, 1H, NH, D ₂ O exchanged), 6.41 (s, 1H), 4.81 – 4.55 (m, 1H, OH, D ₂ O exchanged), 3.91 – 3.69 (m, 1H), 3.67 – 3.50 (m, 2H), 1.90 – 1.53 (m, 6H), 1.34 – 0.98 (m, 5H). MS (ESI ⁺) : [M+H] ⁺ 371.2.
42		C ₂₀ H ₂₄ N ₄ O ₂ S	384.0	>98%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆) of major tautomer δ _H 10.27 (br s, 1H, NH, D ₂ O exchanged), 9.38 – 9.24 (m, 1H), 8.94 – 8.72 (m, 1H), 8.39 – 8.12 (m, 1H), 8.12 – 7.96 (m, 1H), 7.24 (br s, 1H, NH, D ₂ O exchanged), 6.50 – 6.25 (m, 1H), 4.03 – 3.83 (m, 1H), 3.60 – 3.44 (m, 2H), 3.31 (s, 3H), 1.86 – 1.53 (m, 6H), 1.30 – 1.03 (m, 5H). MS (ESI ⁺) : [M+H] ⁺ 385.2.

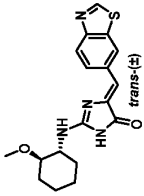
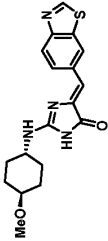
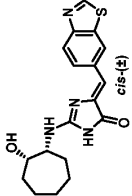
Cpd N°	Structure	Formula	MW	HPLC	Description
43		C ₁₉ H ₂₂ N ₄ O ₂ S	370.47	>98%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 298K) of major tautomer δ _H 10.54 (br s, 1H, NH, D ₂ O exchanged), 9.35 (s, 1H), 8.94 (s, 1H), 8.29 – 8.09 (m, 1H), 8.01 (d, <i>J</i> = 8.6 Hz, 1H), 7.42 (br s, 1H, NH, D ₂ O exchanged), 6.41 (s, 1H), 4.95 – 4.72 (br s, 1H, OH, D ₂ O exchanged), 3.82 – 3.36 (m, 2H), 3.25 – 3.08 (m, 1H), 2.02 – 1.50 (m, 5H), 1.45 – 0.91 (m, 6H). MS (ESI ⁺) : [M+H] ⁺ 371.3.
44		C ₂₀ H ₂₄ N ₄ O ₂ S	384.50	97%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 323K) of major tautomer δ _H 10.46 (br s, 1H, NH, D ₂ O exchanged), 9.33 (s, 1H), 8.96 (s, 1H), 8.15 (d, <i>J</i> = 8.7 Hz, 1H), 8.01 (d, <i>J</i> = 8.5 Hz, 1H), 7.42 (br s, 1H, NH, D ₂ O exchanged), 6.43 (s, 1H), 3.71 – 3.55 (m, 1H), 3.45 – 3.33 (m, 4H), 3.32 – 3.23 (m, 1H), 1.90 – 1.50 (m, 6H), 1.28 – 1.07 (m, 5H). MS (ESI ⁺) : [M+H] ⁺ 385.2.
45		C ₁₆ H ₁₆ N ₄ O ₂ S	328.39	>98%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 373K) of major tautomer δ _H 10.13 (br s, 1H, NH, D ₂ O exchanged), 9.28 (s, 1H), 8.87 – 8.67 (m, 1H), 8.41 – 8.13 (m, 1H), 8.09 – 7.94 (m, 1H), 6.73 (br s, 1H, NH, D ₂ O exchanged), 6.44 (s, 1H), 4.73 (br s, 1H, OH, D ₂ O exchanged), 4.22 – 3.96 (m, 2H), 2.11 – 1.51 (m, 6H). MS (ESI ⁺) : [M+H] ⁺ 329.2.

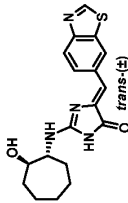
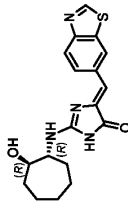
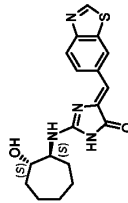
Cpd N°	Structure	Formula	MW	HPLC	Description
46		C ₁₆ H ₁₆ N ₄ O ₂ S	328.39	>98%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 323K) of major tautomer δ _H 10.53 (br s, 1H, NH, D ₂ O exchanged), 9.33 (s, 1H), 8.93 – 8.63 (m, 1H), 8.35 – 8.12 (m, 1H), 8.03 (d, <i>J</i> = 8.3 Hz, 1H), 7.61 (br s, 1H, NH, D ₂ O exchanged), 6.42 (s, 1H), 4.94 (br s, 1H, OH, D ₂ O exchanged), 4.10 – 3.75 (m, 2H), 2.18 – 2.03 (m, 1H), 1.98 – 1.82 (m, 1H), 1.79 – 1.42 (m, 4H). MS (ESI ⁺) : [M+H] ⁺ 329.2.
47		C ₁₇ H ₁₈ N ₄ O ₂ S	342.42	98%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 343K) of major tautomer δ _H 10.18 (br s, 1H, NH, D ₂ O exchanged), 9.31 (s, 1H), 8.79 (s, 1H), 8.44 – 8.15 (m, 1H), 8.15 – 7.97 (m, 1H), 6.96 (br s, 1H, NH, D ₂ O exchanged), 6.44 (s, 1H), 4.24 (s, 1H), 3.81 (s, 1H), 3.30 (s, 3H), 2.13 – 1.90 (m, 1H), 1.89 – 1.50 (m, 5H). MS (ESI ⁺) : [M+H] ⁺ 343.2.
48		C ₁₇ H ₁₈ N ₄ O ₂ S	342.42	97%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 343K) of major tautomer δ _H 10.12 (br s, 1H, NH, D ₂ O exchanged), 9.28 (s, 1H), 8.97 – 8.76 (m, 1H), 8.25 – 8.09 (m, 1H), 8.01 (d, <i>J</i> = 8.3 Hz, 1H), 7.28 (br s, 1H, NH, D ₂ O exchanged), 6.46 (s, 1H), 4.21 – 4.12 (m, 1H), 3.86 – 3.79 (m, 1H), 3.38 (s, 3H), 2.17 – 2.04 (m, 1H), 2.00 – 1.88 (m, 1H), 1.80 – 1.58 (m, 4H). MS (ESI ⁺) : [M+H] ⁺ 343.2.

Cpd N°	Structure	Formula	MW	HPLC	Description
49		C ₁₇ H ₁₈ N ₄ O ₂ S	342.42	>98%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 343K) of major tautomer δ _H 10.18 (br s, 1H, NH, D ₂ O exchanged), 9.31 (s, 1H), 8.80 (s, 1H), 8.22 (d, <i>J</i> = 8.3 Hz, 1H), 8.02 (d, <i>J</i> = 8.6 Hz, 1H), 6.86 (br s, 1H, NH, D ₂ O exchanged), 6.42 (s, 1H), 4.77 – 4.63 (m, 1H, OH, D ₂ O exchanged), 4.02 – 3.74 (m, 2H), 1.88 – 1.47 (m, 6H), 1.46 – 1.25 (m, 2H). MS (ESI ⁺) : [M+H] ⁺ 343.2.
50		C ₁₇ H ₁₈ N ₄ O ₂ S	342.42	>98%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 343K) of major tautomer δ _H 10.45 (br s, 1H, NH, D ₂ O exchanged), 9.30 (s, 1H), 8.83 (s, 1H), 8.31 – 8.09 (m, 1H), 8.09 – 7.96 (m, 1H), 7.35 (br s, 1H, NH, D ₂ O exchanged), 6.39 (s, 1H), 4.64 (br s, 1H, OH, D ₂ O exchanged), 3.59 – 3.31 (m, 2H), 2.13 – 1.84 (m, 2H), 1.78 – 1.58 (m, 2H), 1.48 – 1.11 (m, 4H). MS (ESI ⁺) : [M+H] ⁺ 343.2.
51		C ₁₇ H ₁₈ N ₄ O ₂ S	342.42	>98%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 343K) of major tautomer δ _H 10.18 (br s, 1H, NH, D ₂ O exchanged), 9.31 (s, 1H), 8.80 (s, 1H), 8.22 (d, <i>J</i> = 8.3 Hz, 1H), 8.02 (d, <i>J</i> = 8.6 Hz, 1H), 6.86 (br s, 1H, NH, D ₂ O exchanged), 6.42 (s, 1H), 4.77 – 4.63 (m, 1H, OH, D ₂ O exchanged), 4.02 – 3.74 (m, 2H), 1.88 – 1.47 (m, 6H), 1.46 – 1.25 (m, 2H). MS (ESI ⁺) : [M+H] ⁺ 343.2.
52		C ₁₇ H ₁₈ N ₄ O ₂ S	342.42	>98%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 343K) of major tautomer δ _H 10.18 (br s, 1H, NH, D ₂ O exchanged), 9.31 (s, 1H), 8.80 (s, 1H), 8.22 (d, <i>J</i> = 8.3 Hz, 1H), 8.02 (d, <i>J</i> = 8.6 Hz, 1H), 6.86 (br s, 1H, NH, D ₂ O exchanged), 6.42 (s, 1H), 4.77 – 4.63 (m, 1H, OH, D ₂ O exchanged), 4.02 – 3.74 (m, 2H), 1.88 – 1.47 (m, 6H), 1.46 – 1.25 (m, 2H). MS (ESI ⁺) : [M+H] ⁺ 343.2.

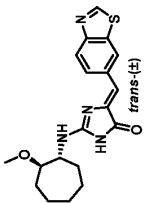
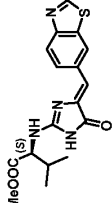
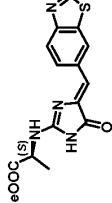
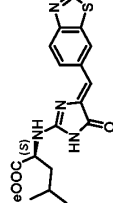
Cpd N ^o	Structure	Formula	MW	HPLC	Description
53		C ₁₇ H ₁₈ N ₄ O ₂ S	342.42	97%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 343K) of major tautomer δ _H 10.45 (br s, 1H, NH, D ₂ O exchanged), 9.30 (s, 1H), 8.83 (s, 1H), 8.31 – 8.09 (m, 1H), 8.09 – 7.96 (m, 1H), 7.35 (br s, 1H, NH, D ₂ O exchanged), 6.39 (s, 1H), 4.64 (br s, 1H, OH, D ₂ O exchanged), 3.59 – 3.31 (m, 2H), 2.13 – 1.84 (m, 2H), 1.78 – 1.58 (m, 2H), 1.48 – 1.11 (m, 4H). MS (ESI ⁺) : [M+H] ⁺ 343.2.
54		C ₁₇ H ₁₈ N ₄ O ₂ S	342.42	>98%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 343K) of major tautomer δ _H 10.45 (br s, 1H, NH, D ₂ O exchanged), 9.30 (s, 1H), 8.83 (s, 1H), 8.31 – 8.09 (m, 1H), 8.09 – 7.96 (m, 1H), 7.35 (br s, 1H, NH, D ₂ O exchanged), 6.39 (s, 1H), 4.64 (br s, 1H, OH, D ₂ O exchanged), 3.59 – 3.31 (m, 2H), 2.13 – 1.84 (m, 2H), 1.78 – 1.58 (m, 2H), 1.48 – 1.11 (m, 4H). MS (ESI ⁺) : [M+H] ⁺ 343.2.
55		C ₁₇ H ₁₈ N ₄ O ₂ S	342.42	>98%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 373K) of major tautomer δ _H 10.24 (br s, 1H, NH, D ₂ O exchanged), 9.28 (s, 1H), 8.91 – 8.53 (m, 1H), 8.31 – 8.05 (m, 1H), 8.02 (d, <i>J</i> = 8.2 Hz, 1H), 7.24 (br s, 1H, NH, D ₂ O exchanged), 6.42 (s, 1H), 4.39 (br s, 1H, OH, D ₂ O exchanged), 3.88 – 3.75 (m, 1H), 3.66 – 3.53 (m, 1H), 2.21 – 2.05 (m, 1H), 1.94 – 1.69 (m, 3H), 1.41 – 1.14 (m, 4H). MS (ESI ⁺) : [M+H] ⁺ 343.2.

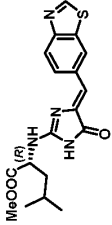
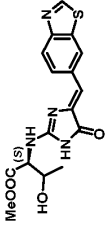
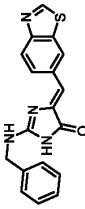
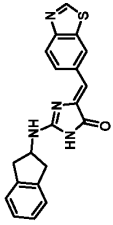
Cpd N°	Structure	Formula	MW	HPLC	Description
56		C ₁₇ H ₁₈ N ₄ O ₂ S	342.42	>98%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 323K) of major tautomer δ _H 10.34 (br s, 1H, NH, D ₂ O exchanged), 9.33 (s, 1H), 8.97 – 8.55 (m, 1H), 8.37 – 8.09 (m, 1H), 8.03 (d, <i>J</i> = 8.4 Hz, 1H), 7.40 (br s, 1H, NH, D ₂ O exchanged), 6.40 (s, 1H), 4.53 – 4.32 (br s, 1H, OH, D ₂ O exchanged), 4.24 – 4.02 (m, 1H), 4.01 – 3.91 (m, 1H), 1.90 – 1.60 (m, 4H), 1.59 – 1.34 (m, 4H). MS (ESI ⁺) : [M+H] ⁺ 343.1.
57		C ₁₇ H ₁₈ N ₄ O ₂ S	342.42	>98%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 343K) of major tautomer δ _H 10.34 (br s, 1H, NH, D ₂ O exchanged), 9.31 (s, 1H), 9.05 – 8.54 (m, 1H), 8.41 – 8.08 (m, 1H), 8.02 (d, <i>J</i> = 8.4 Hz, 1H), 7.36 (br s, 1H, NH, D ₂ O exchanged), 6.41 (s, 1H), 4.36 (d, <i>J</i> = 4.4 Hz, 1H, OH, D ₂ O exchanged), 3.79 – 3.55 (m, 1H), 3.52 – 3.34 (m, 1H), 2.12 – 1.76 (m, 4H), 1.55 – 1.20 (m, 4H). MS (ESI ⁺) : [M+H] ⁺ 343.2.
58		C ₁₈ H ₂₀ N ₄ O ₂ S	356.44	98%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 343K) of major tautomer δ _H 10.06 (br s, 1H, NH, D ₂ O exchanged), 9.31 (s, 1H), 8.81 (s, 1H), 8.23 (d, <i>J</i> = 8.1 Hz, 1H), 8.02 (d, <i>J</i> = 8.9 Hz, 1H), 6.96 (br s, 1H, NH, D ₂ O exchanged), 6.44 (s, 1H), 4.15 – 3.83 (m, 1H), 3.59 – 3.44 (m, 1H), 3.32 (s, 3H), 2.00 – 1.88 (m, 1H), 1.81 – 1.57 (m, 3H), 1.57 – 1.30 (m, 4H). MS (ESI ⁺) : [M+H] ⁺ 357.2.

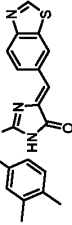
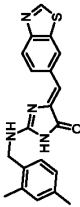
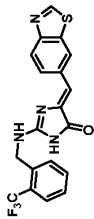
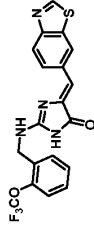
Cpd N°	Structure	Formula	MW	HPLC	Description
59		C ₁₈ H ₂₀ N ₄ O ₂ S	356.44	>98%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 323K) of major tautomer δ _H 10.62 (br s, 1H, NH, D ₂ O exchanged), 9.32 (s, 1H), 8.84 (s, 1H), 8.20 (d, <i>J</i> = 8.7 Hz, 1H), 8.01 (d, <i>J</i> = 8.6 Hz, 1H), 7.65 (br s, 1H, NH, D ₂ O exchanged), 6.39 (s, 1H), 3.82 – 3.53 (m, 1H), 3.31 (s, 3H), 3.25 – 3.12 (m, 1H), 2.15 – 1.90 (m, 2H), 1.76 – 1.59 (m, 2H), 1.47 – 1.15 (m, 4H). MS (ESI ⁺) : [M+H] ⁺ 357.2.
60		C ₁₈ H ₂₀ N ₄ O ₂ S	356.44	>98%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 343K) of major tautomer δ _H 10.51 (br s, 1H, NH, D ₂ O exchanged), 9.30 (s, 1H), 8.83 (s, 1H), 8.20 (d, <i>J</i> = 8.6 Hz, 1H), 8.02 (d, <i>J</i> = 8.6 Hz, 1H), 7.41 (br s, 1H, NH, D ₂ O exchanged), 6.41 (s, 1H), 3.82 – 3.62 (m, 1H), 3.27 (s, 3H), 3.22 – 3.12 (m, 1H), 2.10 – 1.93 (m, 4H), 1.50 – 1.36 (m, 2H), 1.36 – 1.22 (m, 2H). MS (ESI ⁺) : [M+H] ⁺ 357.2.
61		C ₁₈ H ₂₀ N ₄ O ₂ S	356.44	>98%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 300K) of major tautomer δ _H 10.15 (br s, 1H, NH, D ₂ O exchanged), 9.35 (s, 1H), 8.90 (s, 1H), 8.22 (d, <i>J</i> = 9.0 Hz, 1H), 8.02 (d, <i>J</i> = 8.5 Hz, 1H), 7.07 (br s, 1H, NH, D ₂ O exchanged), 6.42 (s, 1H), 4.96 (br s, 1H, OH, D ₂ O exchanged), 4.08 – 3.77 (m, 2H), 1.98 – 1.29 (m, 10H). MS (ESI ⁺) : [M+H] ⁺ 357.2.

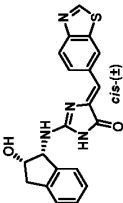
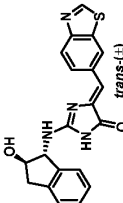
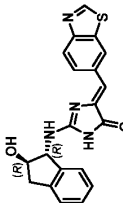
Cpd N°	Structure	Formula	MW	HPLC	Description
62		C ₁₈ H ₂₀ N ₄ O ₂ S	356.44	>98%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 323K) of major tautomer δ _H 10.46 (br s, 1H, NH, D ₂ O exchanged), 9.33 (s, 1H), 9.08 – 8.72 (m, 1H), 8.39 – 8.09 (m, 1H), 8.02 (d, <i>J</i> = 8.5 Hz, 1H), 7.45 (br s, 1H, NH, D ₂ O exchanged), 6.40 (s, 1H), 4.76 (br s, 1H, OH, D ₂ O exchanged), 3.89 – 3.53 (m, 2H), 2.03 – 1.37 (m, 10H). MS (ESI ⁺) : [M+H] ⁺ 357.2.
63		C ₁₈ H ₂₀ N ₄ O ₂ S	356.44	>98%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 323K) of major tautomer δ _H 10.46 (br s, 1H, NH, D ₂ O exchanged), 9.33 (s, 1H), 9.08 – 8.72 (m, 1H), 8.39 – 8.09 (m, 1H), 8.02 (d, <i>J</i> = 8.5 Hz, 1H), 7.45 (br s, 1H, NH, D ₂ O exchanged), 6.40 (s, 1H), 4.76 (br s, 1H, OH, D ₂ O exchanged), 3.89 – 3.53 (m, 2H), 2.03 – 1.37 (m, 10H). MS (ESI ⁺) : [M+H] ⁺ 357.2.
64		C ₁₈ H ₂₀ N ₄ O ₂ S	356.44	97%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 323K) of major tautomer δ _H 10.46 (br s, 1H, NH, D ₂ O exchanged), 9.33 (s, 1H), 9.08 – 8.72 (m, 1H), 8.39 – 8.09 (m, 1H), 8.02 (d, <i>J</i> = 8.5 Hz, 1H), 7.45 (br s, 1H, NH, D ₂ O exchanged), 6.40 (s, 1H), 4.76 (br s, 1H, OH, D ₂ O exchanged), 3.89 – 3.53 (m, 2H), 2.03 – 1.37 (m, 10H). MS (ESI ⁺) : [M+H] ⁺ 357.4.

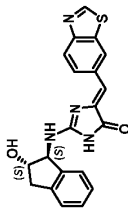
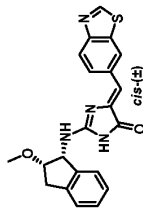
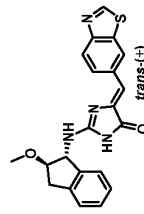
Cpd N°	Structure	Formula	MW	HPLC	Description
65		C ₁₈ H ₂₀ N ₄ O ₂ S	356.44	>98%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 373K) of major tautomer δ _H 10.15 (br s, 1H, NH, D ₂ O exchanged), 9.28 (s, 1H), 8.99 – 8.54 (m, 1H), 8.28 – 8.06 (m, 1H), 8.02 (d, <i>J</i> = 7.8 Hz, 1H), 7.17 (br s, 1H, NH, D ₂ O exchanged), 6.43 (s, 1H), 4.23 (br s, 1H, OH, D ₂ O exchanged), 4.05 – 3.91 (m, 1H), 3.90 – 3.77 (m, 1H), 2.21 – 2.05 (m, 1H), 2.05 – 1.39 (m, 9H). MS (ESI ⁺) : [M+H] ⁺ 357.2.
66		C ₁₈ H ₂₀ N ₄ O ₂ S	356.44	>98%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 323K) of major tautomer δ _H 10.33 (br s, 1H, NH, D ₂ O exchanged), 9.33 (s, 1H), 8.99 – 8.65 (m, 1H), 8.34 – 8.07 (m, 1H), 8.02 (d, <i>J</i> = 8.4 Hz, 1H), 7.51 (br s, 1H, NH, D ₂ O exchanged), 6.41 (s, 1H), 4.47 (br s, 1H, OH, D ₂ O exchanged), 4.19 – 4.01 (m, 1H), 3.96 – 3.83 (m, 1H), 2.08 – 1.89 (m, 3H), 1.86 – 1.30 (m, 7H). MS (ESI ⁺) : [M+H] ⁺ 357.2.
67		C ₁₉ H ₂₂ N ₄ O ₂ S	370.47	>98%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 300K) of major tautomer δ _H 10.04 (br s, 1H, NH, D ₂ O exchanged), 9.35 (s, 1H), 8.89 (s, 1H), 8.23 (d, <i>J</i> = 9.0 Hz, 1H), 8.02 (d, <i>J</i> = 8.5 Hz, 1H), 7.21 (br s, 1H, NH, D ₂ O exchanged), 6.43 (s, 1H), 4.25 – 3.85 (m, 1H), 3.74 – 3.49 (m, 1H), 3.31 (s, 3H), 2.03 – 1.28 (m, 10H). MS (ESI ⁺) : [M+H] ⁺ 371.2.

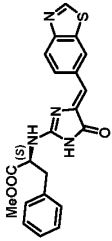
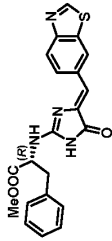
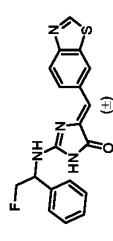
Cpd N°	Structure	Formula	MW	HPLC	Description
68		<chem>C19H22N4O2S</chem>	370.47	98%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 343K) of major tautomer δ _H 10.39 (br s, 1H, NH, D ₂ O exchanged), 9.30 (s, 1H), 8.90 (s, 1H), 8.18 (d, <i>J</i> = 8.6 Hz, 1H), 8.01 (d, <i>J</i> = 8.6 Hz, 1H), 7.47 (br s, 1H, NH, D ₂ O exchanged), 6.41 (s, 1H), 4.00 – 3.83 (m, 1H), 3.51 – 3.38 (m, 1H), 3.31 (s, 3H), 1.93 – 1.40 (m, 10H). MS (ESI ⁺) : [M+H] ⁺ 371.2.
69		<chem>C17H18N4O3S</chem>	358.42	97%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 300K) of major tautomer δ _H 10.41 (br s, 1H, NH, D ₂ O exchanged), 9.38 (s, 1H), 8.83 (s, 1H), 8.39 – 7.86 (m, 2H + NH, D ₂ O exchanged), 6.48 (s, 1H), 4.50 – 4.26 (m, 1H), 3.73 (s, 3H), 2.29 – 2.16 (m, 1H), 1.16 – 0.80 (m, 6H). MS (ESI ⁺) : [M+H] ⁺ 359.2.
70		<chem>C15H14N4O3S</chem>	330.36	97%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 300K) of major tautomer δ _H 10.85 (br s, 1H, NH, D ₂ O exchanged), 9.37 (s, 1H), 8.83 (s, 1H), 8.19 (d, <i>J</i> = 8.5 Hz, 1H), 8.14 (br s, 1H, NH, D ₂ O exchanged), 8.03 (d, <i>J</i> = 8.6 Hz, 1H), 6.47 (s, 1H), 4.68 – 4.45 (m, 1H), 3.71 (s, 3H), 1.45 (d, <i>J</i> = 7.2 Hz, 3H). MS (ESI ⁺) : [M+H] ⁺ 331.1.
71		<chem>C18H20N4O3S</chem>	372.44	91%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 300K) of major tautomer δ _H 10.75 (br s, 1H, NH, D ₂ O exchanged), 9.37 (s, 1H), 8.85 (s, 1H), 8.19 (d, <i>J</i> = 8.6 Hz, 1H), 8.09 (br s, 1H, NH, D ₂ O exchanged), 8.03 (d, <i>J</i> = 8.6 Hz, 1H), 6.47 (s, 1H), 4.70 – 4.41 (m, 1H), 3.71 (s, 3H), 1.84 – 1.57 (m, 3H), 1.07 – 0.77 (m, 6H). MS (ESI ⁺) : [M+H] ⁺ 373.2.

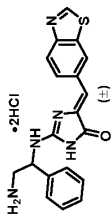
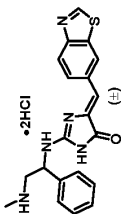
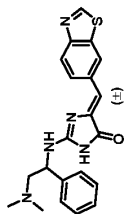
Cpd N°	Structure	Formula	MW	HPLC	Description
72		$C_{18}H_{20}N_4O_3S$	372.44	98%	Yellow solid. 1H NMR (400 MHz, DMSO- d_6 , 300K) of major tautomer δ_H 10.75 (br s, 1H, NH, D $_2$ O exchanged), 9.37 (s, 1H), 8.85 (s, 1H), 8.19 (d, J = 8.6 Hz, 1H), 8.09 (br s, 1H, NH, D $_2$ O exchanged), 8.03 (d, J = 8.6 Hz, 1H), 6.47 (s, 1H), 4.70 – 4.41 (m, 1H), 3.71 (s, 3H), 1.84 – 1.57 (m, 3H), 1.07 – 0.77 (m, 6H). MS (ESI $^+$) : [M+H] $^+$ 373.2.
73		$C_{16}H_{16}N_4O_4S$	360.4	>98%	Yellow solid. 1H NMR (400 MHz, DMSO- d_6 , 300K) of major tautomer δ_H 10.28 (br s, 1H, NH, D $_2$ O exchanged), 9.37 (s, 1H), 8.78 (s, 1H), 8.21 (d, J = 8.5 Hz, 1H), 8.03 (d, J = 8.6 Hz, 1H), 7.58 – 7.34 (br s, 1H, NH, D $_2$ O exchanged), 6.49 (s, 1H), 5.31 (br s, 1H, OH, D $_2$ O exchanged), 4.66 – 4.49 (m, 1H), 4.35 – 4.16 (m, 1H), 3.72 (s, 3H), 1.20 (d, J = 6.3 Hz, 3H). MS (ESI $^+$) : [M+H] $^+$ 361.2.
74		$C_{18}H_{14}N_4O_3S$	334.40	97%	Yellow solid. 1H NMR (400 MHz, DMSO- d_6 , 300K) of major tautomer δ_H 10.86 (br s, 1H, NH, D $_2$ O exchanged), 9.36 (s, 1H), 8.84 (s, 1H), 8.26 – 8.20 (m, 1H), 8.19 – 8.06 (br s, 1H, NH, D $_2$ O exchanged), 8.03 (d, J = 8.6 Hz, 1H), 7.55 – 7.20 (m, 5H), 6.43 (s, 1H), 4.67 – 4.48 (m, 2H). MS (ESI $^+$) : [M+H] $^+$ 335.2.
75		$C_{20}H_{16}N_4O_3S$	360.44	>98%	Yellow solid. 1H NMR (500 MHz, DMSO- d_6 , 300K) of major tautomer δ_H 10.55 (br s, 1H, NH, D $_2$ O exchanged), 9.35 (s, 1H), 8.81 (s, 1H), 8.44 – 8.17 (m, 1H), 8.03 (d, J = 8.5 Hz, 1H), 7.92 (br s, 1H, NH, D $_2$ O exchanged), 7.32 – 7.22 (m, 2H), 7.20 – 7.17 (m, 2H), 6.44 (s, 1H), 4.96 – 4.44 (m, 1H), 3.38 – 3.31 (m, 2H), 3.09 – 2.88 (m, 2H). MS (ESI $^+$) : [M+H] $^+$ 361.1.

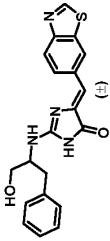
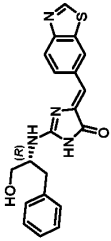
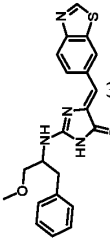
Cpd N°	Structure	Formula	MW	HPLC	Description
76		C ₂₀ H ₁₈ N ₄ O ₂ S	362.45	>98%	Yellow solid. ¹ H NMR (500 MHz, DMSO- <i>d</i> ₆ , 300K) of major tautomer δ _H 10.79 (br s, 1H, NH, D ₂ O exchanged), 9.36 (s, 1H), 8.86 (s, 1H), 8.24 (d, <i>J</i> = 8.6 Hz, 1H), 8.03 (d, <i>J</i> = 8.5 Hz, 1H), 7.99 (br s, 1H, NH, D ₂ O exchanged), 7.28 – 7.06 (m, 3H), 6.42 (s, 1H), 4.50 (s, 2H), 2.21 (s, 3H), 2.18 (s, 3H) MS (ESI ⁺) : [M+H] ⁺ 363.2.
77		C ₂₀ H ₁₈ N ₄ O ₂ S	362.45	>98%	Yellow solid. ¹ H NMR (500 MHz, DMSO- <i>d</i> ₆ , 300K) of major tautomer δ _H 10.69 (br s, 1H, NH, D ₂ O exchanged), 9.36 (s, 1H), 8.88 (s, 1H), 8.22 (d, <i>J</i> = 7.9 Hz, 1H), 8.15 (br s, 1H, NH, D ₂ O exchanged), 8.03 (d, <i>J</i> = 8.0 Hz, 1H), 7.29 – 7.17 (m, 1H), 7.14 – 7.03 (m, 1H), 7.03 – 6.89 (m, 1H), 6.43 (s, 1H), 4.54 (s, 2H), 2.36 (s, 3H), 2.25 (s, 3H). MS (ESI ⁺) : [M+H] ⁺ 363.2.
78		C ₁₉ H ₁₃ F ₃ N ₄ O ₂ S	402.40	>98%	Yellow solid. ¹ H NMR (500 MHz, DMSO- <i>d</i> ₆ , 300K) of major tautomer δ _H 10.96 (br s, 1H, NH, D ₂ O exchanged), 9.34 (s, 1H), 8.87 (s, 1H), 8.23 (br s, 1H, NH, D ₂ O exchanged), 8.10 – 7.93 (m, 2H), 7.77 (d, <i>J</i> = 7.8 Hz, 1H), 7.74 – 7.62 (m, 2H), 7.55 – 7.43 (m, 1H), 6.44 (s, 1H), 4.80 (s, 2H) MS (ESI ⁺) : [M+H] ⁺ 403.1.
79		C ₁₉ H ₁₃ F ₃ N ₄ O ₂ S	418.39	98%	Yellow solid. ¹ H NMR (500 MHz, DMSO- <i>d</i> ₆ , 300K) of major tautomer δ _H 10.93 (br s, 1H, NH, D ₂ O exchanged), 9.36 (s, 1H), 8.83 (s, 1H), 8.23 (d, <i>J</i> = 8.5 Hz, 1H), 8.14 (br s, 1H, NH, D ₂ O exchanged), 8.02 (d, <i>J</i> = 8.5 Hz, 1H), 7.57 – 7.36 (m, 3H), 7.27 (d, <i>J</i> = 7.6 Hz, 1H), 6.45 (s, 1H), 4.63 (s, 2H). MS (ESI ⁺) : [M+H] ⁺ 419.2.

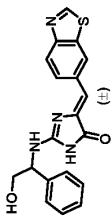
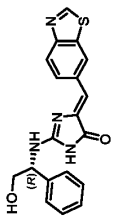
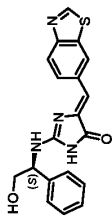
Cpd N°	Structure	Formula	MW	HPLC	Description
80		C ₂₀ H ₁₆ N ₄ O ₂ S	376.43	>98%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 323K) of major tautomer δ _H 10.25 (br s, 1H, NH, D ₂ O exchanged), 9.31 (s, 1H), 8.80 (s, 1H), 8.30 (d, <i>J</i> = 8.7 Hz, 1H), 8.01 (d, <i>J</i> = 8.6 Hz, 1H), 7.55 – 7.07 (m, 4H + NH, D ₂ O exchanged), 6.51 (s, 1H), 5.54 – 5.40 (m, 1H), 5.34 (br s, 1H, OH, D ₂ O exchanged), 4.68 – 4.57 (m, 1H), 3.19 – 3.13 (m, 1H), 2.96 – 2.84 (m, 1H). MS (ESI ⁺) : [M+H] ⁺ 377.2.
81		C ₂₀ H ₁₆ N ₄ O ₂ S	376.43	>98%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 373K) of major tautomer δ _H 10.18 (br s, 1H, NH, D ₂ O exchanged), 9.27 (s, 1H), 8.87 – 8.56 (m, 1H), 8.27 – 8.06 (m, 1H), 8.01 (d, <i>J</i> = 8.4 Hz, 1H), 7.67 (br s, 1H, NH, D ₂ O exchanged), 7.39 – 7.11 (m, 4H), 6.49 (s, 1H), 5.55 – 4.90 (m, 1H + OH, D ₂ O exchanged), 4.49 (q, <i>J</i> = 6.7 Hz, 1H), 3.26 (dd, <i>J</i> = 15.7, 7.1 Hz, 1H), 2.82 (dd, <i>J</i> = 15.7, 6.9 Hz, 1H). MS (ESI ⁺) : [M+H] ⁺ 377.2.
82		C ₂₀ H ₁₆ N ₄ O ₂ S	376.43	>98%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 373K) of major tautomer δ _H 10.18 (br s, 1H, NH, D ₂ O exchanged), 9.27 (s, 1H), 8.87 – 8.56 (m, 1H), 8.27 – 8.06 (m, 1H), 8.01 (d, <i>J</i> = 8.4 Hz, 1H), 7.67 (br s, 1H, NH, D ₂ O exchanged), 7.39 – 7.11 (m, 4H), 6.49 (s, 1H), 5.55 – 4.90 (m, 1H + OH, D ₂ O exchanged), 4.49 (q, <i>J</i> = 6.7 Hz, 1H), 3.26 (dd, <i>J</i> = 15.7, 7.1 Hz, 1H), 2.82 (dd, <i>J</i> = 15.7, 6.9 Hz, 1H). MS (ESI ⁺) : [M+H] ⁺ 377.1.

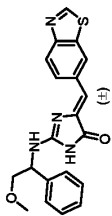
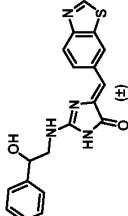
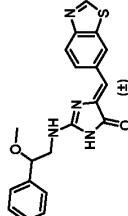
Cpd N°	Structure	Formula	MW	HPLC	Description
83		C ₂₀ H ₁₆ N ₄ O ₂ S	376.43	>98%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 373K) of major tautomer δ _H 10.18 (br s, 1H, NH, D ₂ O exchanged), 9.27 (s, 1H), 8.87 – 8.56 (m, 1H), 8.27 – 8.06 (m, 1H), 8.01 (d, <i>J</i> = 8.4 Hz, 1H), 7.67 (br s, 1H, NH, D ₂ O exchanged), 7.39 – 7.11 (m, 4H), 6.49 (s, 1H), 5.55 – 4.90 (m, 1H + OH, D ₂ O exchanged), 4.49 (q, <i>J</i> = 6.7 Hz, 1H), 3.26 (dd, <i>J</i> = 15.7, 7.1 Hz, 1H), 2.82 (dd, <i>J</i> = 15.7, 6.9 Hz, 1H). MS (ESI ⁺) : [M+H] ⁺ 377.1.
84		C ₂₁ H ₁₈ N ₄ O ₂ S	390.46	>98%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 300K) of major tautomer δ _H 10.22 (br s, 1H, NH, D ₂ O exchanged), 9.34 (s, 1H), 8.82 (s, 1H), 8.44 – 8.23 (m, 1H), 8.02 (d, <i>J</i> = 8.6 Hz, 1H), 7.51 (br s, 1H, NH, D ₂ O exchanged), 7.44 – 7.15 (m, 4H), 6.51 (s, 1H), 5.77 – 5.54 (m, 1H), 4.39 – 4.19 (m, 1H), 3.35 (s, 3H), 3.19 – 3.01 (m, 2H). MS (ESI ⁺) : [M+H] ⁺ 391.2.
85		C ₂₁ H ₁₈ N ₄ O ₂ S	390.46	>98%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 300K) of major tautomer δ _H 10.73 (br s, 1H, NH, D ₂ O exchanged), 9.35 (s, 1H), 8.82 (s, 1H), 8.23 (dd, <i>J</i> = 8.6, 1.6 Hz, 1H), 8.12 (br s, 1H, NH, D ₂ O exchanged), 8.01 (d, <i>J</i> = 8.6 Hz, 1H), 7.44 – 7.10 (m, 4H), 6.48 (s, 1H), 5.60 – 5.22 (m, 1H), 4.30 – 4.13 (m, 1H), 3.46 (s, 3H), 3.41 – 3.33 (m, 1H), 2.93 – 2.74 (m, 1H). MS (ESI ⁺) : [M+H] ⁺ 391.2.

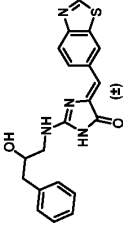
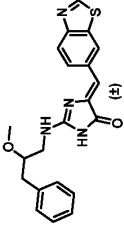
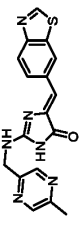
Cpd N°	Structure	Formula	MW	HPLC	Description
86		C ₂₁ H ₁₈ N ₄ O ₃ S	406.46	>98%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 300K) of major tautomer δ _H 10.68 (br s, 1H, D ₂ O exchanged), 9.38 (s, 1H), 8.82 (s, 1H), 8.19 (d, <i>J</i> = 8.6 Hz, 1H), 8.03 (d, <i>J</i> = 8.5 Hz, 1H), 8.00 (br s, 1H, NH, D ₂ O exchanged), 7.39 – 7.18 (m, 5H), 6.47 (s, 1H), 4.82 – 4.66 (m, 1H), 3.68 (s, 3H), 3.26 – 3.09 (m, 2H). MS (ESI ⁺) : [M+H] ⁺ 407.2.
87		C ₂₁ H ₁₈ N ₄ O ₃ S	406.46	>98%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 300K) of major tautomer δ _H 10.68 (br s, 1H, D ₂ O exchanged), 9.38 (s, 1H), 8.82 (s, 1H), 8.19 (d, <i>J</i> = 8.6 Hz, 1H), 8.03 (d, <i>J</i> = 8.5 Hz, 1H), 8.00 (br s, 1H, NH, D ₂ O exchanged), 7.39 – 7.18 (m, 5H), 6.47 (s, 1H), 4.82 – 4.66 (m, 1H), 3.68 (s, 3H), 3.26 – 3.09 (m, 2H). MS (ESI ⁺) : [M+H] ⁺ 407.1.
88		C ₁₉ H ₁₅ FN ₄ O ₃ S	366.41	94%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 300K) of major tautomer δ _H 10.76 (br s, 1H, NH, D ₂ O exchanged), 9.37 (s, 1H), 8.83 (s, 1H), 8.45 (br s, 1H, NH, D ₂ O exchanged), 8.19 (d, <i>J</i> = 8.6 Hz, 1H), 8.03 (d, <i>J</i> = 8.6 Hz, 1H), 7.58 – 7.16 (m, 5H), 6.44 (s, 1H), 5.58 – 5.22 (m, 1H), 4.96 – 4.52 (m, 2H). MS (ESI ⁺) : [M+H] ⁺ 367.1.

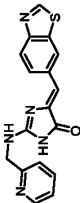
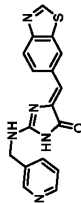
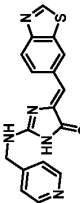
Cpd N°	Structure	Formula	MW	HPLC	Description
89		$C_{19}H_{19}Cl_2N_5OS$	436.36	>98%	Yellow solid. 1H NMR (400 MHz, DMSO- d_6 , 323K) of major tautomer δ_H 9.38 (s, 1H), 8.88 – 8.73 (m, 1H), 8.28 (br s, 3H, NH, D $_2$ O exchanged), 8.14 – 8.02 (m, 2H), 7.53 (d, J = 7.3 Hz, 2H), 7.44 (t, J = 7.6 Hz, 2H), 7.35 (t, J = 7.3 Hz, 1H), 6.55 (s, 1H), 5.53 – 5.35 (m, 1H), 4.45 (br s, 3H, NH, D $_2$ O exchanged), 3.50 – 3.37 (m, 1H), 3.34 – 3.22 (m, 1H). MS (ESI $^+$) : [M+H] $^+$ 364.1 (+2HCl).
90		$C_{20}H_{21}Cl_2N_5OS$	450.38	84%	Yellow solid. 1H NMR (400 MHz, DMSO- d_6 + D $_2$ O, 300K) of major tautomer δ_H 9.39 (s, 1H), 8.82 (s, 1H), 8.18 (s, 1H), 8.06 (d, J = 8.3 Hz, 1H), 7.73 – 7.28 (m, 5H), 6.52 (s, 1H), 5.61 – 5.43 (m, 1H), 3.43 – 3.33 (m, 1H), 3.14 – 3.04 (m, 1H), 2.66 (s, 3H). MS (ESI $^+$) : [M+H] $^+$ 378.2 (+2HCl).
91		$C_{21}H_{21}N_5OS$	391.49	>98%	Yellow solid. 1H NMR (400 MHz, DMSO- d_6 , 323K) of major tautomer δ_H 10.56 (br s, 1H, NH, D $_2$ O exchanged), 9.34 (s, 1H), 8.86 – 8.66 (m, 1H), 8.15 – 7.96 (m, 2H), 7.83 (br s, 1H, NH, D $_2$ O exchanged), 7.51 – 7.21 (m, 5H), 6.40 (s, 1H), 5.17 – 4.80 (m, 1H), 2.81 (dd, J = 12.5, 9.4 Hz, 1H), 2.49 – 2.42 (m, 1H), 2.26 (s, 6H). MS (ESI $^+$) : [M+H] $^+$ 392.1.

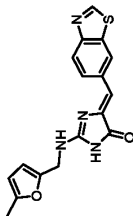
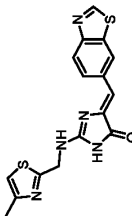
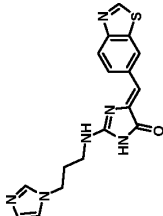
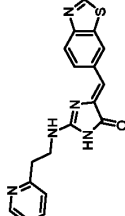
Cpd N°	Structure	Formula	MW	HPLC	Description
92		C ₂₀ H ₁₈ N ₄ O ₂ S	378.45	>98%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 300K) of major tautomer δ _H 10.45 (br s, 1H, NH, D ₂ O exchanged), 9.38 (s, 1H), 9.04 – 8.83 (m, 1H), 8.31 – 8.10 (m, 1H), 8.05 (d, <i>J</i> = 8.4 Hz, 1H), 7.46 (br s, 1H, NH, D ₂ O exchanged), 7.42 – 7.26 (m, 4H), 7.26 – 7.10 (m, 1H), 6.41 (s, 1H), 5.33 – 4.75 (m, 1H, OH, D ₂ O exchanged), 4.30 – 3.84 (m, 1H), 3.68 – 3.39 (m, 2H), 3.11 – 2.70 (m, 2H). MS (ESI ⁺) : [M+H] ⁺ 379.2.
93		C ₂₀ H ₁₈ N ₄ O ₂ S	378.45	>98%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 300K) of major tautomer δ _H 10.45 (br s, 1H, NH, D ₂ O exchanged), 9.38 (s, 1H), 9.04 – 8.83 (m, 1H), 8.31 – 8.10 (m, 1H), 8.05 (d, <i>J</i> = 8.4 Hz, 1H), 7.46 (br s, 1H, NH, D ₂ O exchanged), 7.42 – 7.26 (m, 4H), 7.26 – 7.10 (m, 1H), 6.41 (s, 1H), 5.33 – 4.75 (m, 1H, OH, D ₂ O exchanged), 4.30 – 3.84 (m, 1H), 3.68 – 3.39 (m, 2H), 3.11 – 2.70 (m, 2H). MS (ESI ⁺) : [M+H] ⁺ 379.2.
94		C ₂₁ H ₂₀ N ₄ O ₂ S	392.48	96%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 373K) of major tautomer δ _H 10.09 (br s, 1H, NH, D ₂ O exchanged), 9.29 (s, 1H), 8.96 – 8.72 (m, 1H), 8.33 – 8.07 (m, 1H), 8.03 (d, <i>J</i> = 8.0 Hz, 1H), 7.39 – 7.26 (m, 4H), 7.25 – 7.18 (m, 1H), 7.12 (br s, 1H, NH, D ₂ O exchanged), 6.44 (s, 1H), 4.38 – 4.26 (m, 1H), 3.57 – 3.44 (m, 2H), 3.35 (s, 3H), 3.05 – 2.90 (m, 2H). MS (ESI ⁺) : [M+H] ⁺ 393.2.

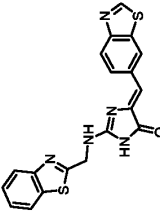
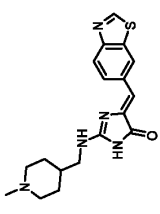
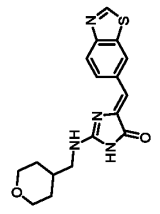
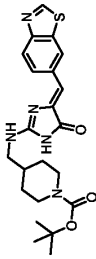
Cpd N ^o	Structure	Formula	MW	HPLC	Description
95		C ₁₉ H ₁₆ N ₄ O ₂ S	364.42	>98%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 323K) of major tautomer δ _H 10.50 (br s, 1H, NH, D ₂ O exchanged), 9.34 (s, 1H), 9.00 – 8.63 (m, 1H), 8.25 – 8.07 (m, 1H), 8.07 – 7.97 (m, 1H), 7.92 (br s, 1H, NH, D ₂ O exchanged), 7.51 – 7.43 (m, 2H), 7.37 (t, <i>J</i> = 7.6 Hz, 2H), 7.26 (t, <i>J</i> = 7.3 Hz, 1H), 6.40 (s, 1H), 5.25 – 4.77 (m, 1H + OH, D ₂ O exchanged), 3.75 (d, <i>J</i> = 6.1 Hz, 2H). MS (ESI ⁺) : [M+H] ⁺ 365.2.
96		C ₁₉ H ₁₆ N ₄ O ₂ S	364.42	>98%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 323K) of major tautomer δ _H 10.50 (br s, 1H, NH, D ₂ O exchanged), 9.34 (s, 1H), 9.00 – 8.63 (m, 1H), 8.25 – 8.07 (m, 1H), 8.07 – 7.97 (m, 1H), 7.92 (br s, 1H, NH, D ₂ O exchanged), 7.51 – 7.43 (m, 2H), 7.37 (t, <i>J</i> = 7.6 Hz, 2H), 7.26 (t, <i>J</i> = 7.3 Hz, 1H), 6.40 (s, 1H), 5.25 – 4.77 (m, 1H + OH, D ₂ O exchanged), 3.75 (d, <i>J</i> = 6.1 Hz, 2H). MS (ESI ⁺) : [M+H] ⁺ 365.2.
97		C ₁₉ H ₁₆ N ₄ O ₂ S	364.42	>98%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 323K) of major tautomer δ _H 10.50 (br s, 1H, NH, D ₂ O exchanged), 9.34 (s, 1H), 9.00 – 8.63 (m, 1H), 8.25 – 8.07 (m, 1H), 8.07 – 7.97 (m, 1H), 7.92 (br s, 1H, NH, D ₂ O exchanged), 7.51 – 7.43 (m, 2H), 7.37 (t, <i>J</i> = 7.6 Hz, 2H), 7.26 (t, <i>J</i> = 7.3 Hz, 1H), 6.40 (s, 1H), 5.25 – 4.77 (m, 1H + OH, D ₂ O exchanged), 3.75 (d, <i>J</i> = 6.1 Hz, 2H). MS (ESI ⁺) : [M+H] ⁺ 365.2.

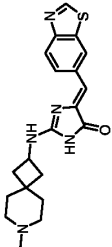
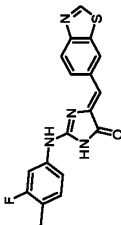
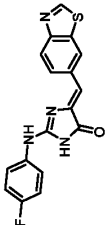
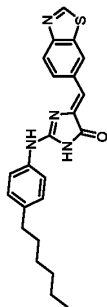
Cpd N°	Structure	Formula	MW	HPLC	Description
98		C ₂₀ H ₁₈ N ₄ O ₂ S	378.45	>98%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 323K) of major tautomer δ _H 10.55 (br s, 1H, NH, D ₂ O exchanged), 9.34 (s, 1H), 8.82 (s, 1H), 8.29 – 7.92 (m, 2H + NH, D ₂ O exchanged), 7.48 (d, <i>J</i> = 7.6 Hz, 2H), 7.38 (t, <i>J</i> = 7.5 Hz, 2H), 7.28 (t, <i>J</i> = 7.3 Hz, 1H), 6.42 (s, 1H), 5.35 – 5.11 (m, 1H), 3.88 – 3.58 (m, 2H), 3.34 (s, 3H). MS (ESI ⁺) : [M+H] ⁺ 379.2.
99		C ₁₉ H ₁₆ N ₄ O ₂ S	364.42	>98%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 300K) of major tautomer δ _H 10.57 (br s, 1H, NH, D ₂ O exchanged), 9.37 (s, 1H), 9.05 – 8.80 (m, 1H), 8.30 – 8.13 (m, 1H), 8.05 (d, <i>J</i> = 8.5 Hz, 1H), 7.57 (br s, 1H, NH, D ₂ O exchanged), 7.53 – 7.23 (m, 5H), 6.44 (s, 1H), 5.69 (br s, 1H, OH, D ₂ O exchanged), 5.19 – 4.67 (m, 1H), 3.85 – 3.50 (m, 1H), 3.48 – 3.33 (m, 1H). MS (ESI ⁺) : [M+H] ⁺ 365.2.
100		C ₂₀ H ₁₈ N ₄ O ₂ S	378.45	98%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 300K) of major tautomer δ _H 10.57 (br s, 1H, NH, D ₂ O exchanged), 9.37 (s, 1H), 8.94 (s, 1H), 8.20 (dd, <i>J</i> = 8.6, 1.6 Hz, 1H), 8.04 (d, <i>J</i> = 8.5 Hz, 1H), 7.67 (br s, 1H, NH, D ₂ O exchanged), 7.53 – 7.26 (m, 5H), 6.45 (s, 1H), 4.73 – 4.41 (m, 1H), 3.80 – 3.42 (m, 2H), 3.21 (s, 3H). MS (ESI ⁺) : [M+H] ⁺ 379.2.

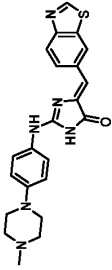
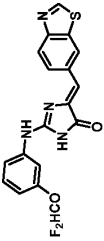
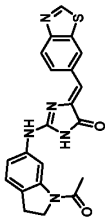
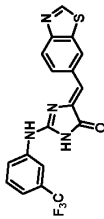
Cpd N°	Structure	Formula	MW	HPLC	Description
101		C ₂₀ H ₁₈ N ₄ O ₂ S	378.45	98%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 373K) of major tautomer δ _H 10.13 (br s, 1H, NH, D ₂ O exchanged), 9.29 (s, 1H), 8.75 – 8.59 (m, 1H), 8.21 – 8.05 (m, 1H), 8.01 (d, <i>J</i> = 8.1 Hz, 1H), 7.35 – 7.15 (m, 5H), 7.14 – 6.92 (br s, 1H, NH, D ₂ O exchanged), 6.44 (s, 1H), 5.12 – 4.60 (m, 1H, OH, D ₂ O exchanged), 4.12 – 3.86 (m, 1H), 3.54 (dd, <i>J</i> = 13.4, 3.8 Hz, 1H), 3.34 (dd, <i>J</i> = 13.3, 7.0 Hz, 1H), 2.89 – 2.72 (m, 2H). MS (ESI ⁺) : [M+H] ⁺ 379.2.
102		C ₂₁ H ₂₀ N ₄ O ₂ S	392.48	96%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 323K) of major tautomer δ _H 10.44 (br s, 1H, NH, D ₂ O exchanged), 9.34 (s, 1H), 8.94 – 8.73 (m, 1H), 8.36 – 8.10 (m, 1H), 8.00 (d, <i>J</i> = 8.6 Hz, 1H), 7.41 (br s, 1H, NH, D ₂ O exchanged), 7.36 – 7.17 (m, 5H), 6.43 (s, 1H), 3.77 – 3.66 (m, 1H), 3.60 – 3.41 (m, 2H), 3.35 (s, 3H), 2.91 – 2.78 (m, 2H). MS (ESI ⁺) : [M+H] ⁺ 393.2.
103		C ₁₇ H ₁₄ N ₆ OS	350.41	97%	Yellow solid. ¹ H NMR (500 MHz, Methanol- <i>d</i> ₄ , 300K) of major tautomer δ _H 9.24 (s, 1H), 8.89 – 8.56 (m, 2H), 8.52 (s, 1H), 8.22 – 7.78 (m, 2H), 6.65 (s, 1H), 4.81 (s, 2H), 2.54 (s, 3H). MS (ESI ⁺) : [M+H] ⁺ 351.2.

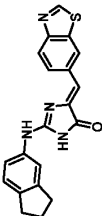
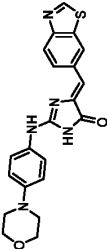
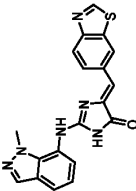
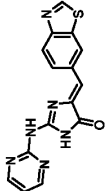
Cpd N°	Structure	Formula	MW	HPLC	Description
104		C ₁₇ H ₁₃ N ₅ OS	335.39	>98%	Yellow solid. ¹ H NMR (500 MHz, DMSO- <i>d</i> ₆ , 300K) of major tautomer δ _H 10.84 (br s, 1H, NH, D ₂ O exchanged), 9.35 (s, 1H), 8.79 (s, 1H), 8.57 (d, <i>J</i> = 4.9 Hz, 1H), 8.21 (d, <i>J</i> = 8.6 Hz, 1H), 8.12 (br s, 1H, NH, D ₂ O exchanged), 8.01 (d, <i>J</i> = 8.5 Hz, 1H), 7.81 (td, <i>J</i> = 7.7, 1.9 Hz, 1H), 7.51 – 7.43 (m, 1H), 7.34 – 7.26 (m, 1H), 6.44 (s, 1H), 4.72 – 4.48 (m, 2H). MS (ESI ⁺) : [M+H] ⁺ 336.2.
105		C ₁₇ H ₁₃ N ₅ OS	335.39	>98%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 300K) of major tautomer δ _H 10.95 (br s, 1H, NH, D ₂ O exchanged), 9.35 (s, 1H), 8.91 – 8.75 (m, 1H), 8.73 – 8.57 (m, 1H), 8.47 (dd, <i>J</i> = 4.8, 1.7 Hz, 1H), 8.30 – 8.20 (m, 1H), 8.15 (br s, 1H, NH, D ₂ O exchanged), 8.03 (d, <i>J</i> = 8.5 Hz, 1H), 7.89 – 7.78 (m, 1H), 7.39 (dd, <i>J</i> = 7.8, 4.8 Hz, 1H), 6.45 (s, 1H), 4.72 – 4.48 (m, 2H). MS (ESI ⁺) : [M+H] ⁺ : 336.2.
106		C ₁₇ H ₁₃ N ₅ OS	335.39	>98%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 300K) of major tautomer δ _H 11.04 (br s, 1H, NH, D ₂ O exchanged), 9.36 (s, 1H), 8.79 (s, 1H), 8.55 (d, <i>J</i> = 5.9 Hz, 2H), 8.20 (d, <i>J</i> = 8.4 Hz, 1H), 8.15 (br s, 1H, NH, D ₂ O exchanged), 8.02 (d, <i>J</i> = 8.6 Hz, 1H), 7.41 (d, <i>J</i> = 4.6 Hz, 2H), 6.45 (s, 1H), 4.72 – 4.54 (m, 2H). MS (ESI ⁺) : [M+H] ⁺ : 336.2.

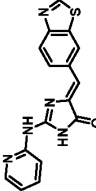
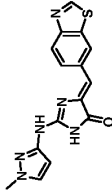
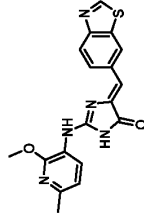
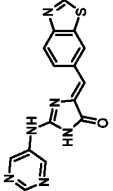
Cpd N°	Structure	Formula	MW	HPLC	Description
107		<chem>C17H14N4O2S</chem>	338.39	>98%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 300K) of major tautomer δ _H 10.77 (br s, 1H, NH, D ₂ O exchanged), 9.36 (s, 1H), 8.86 (s, 1H), 8.27 (d, <i>J</i> = 8.6 Hz, 1H), 8.04 (d, <i>J</i> = 8.6 Hz, 1H), 7.99 (br s, 1H, NH, D ₂ O exchanged), 6.45 (s, 1H), 6.26 (d, <i>J</i> = 3.1 Hz, 1H), 6.02 (dd, <i>J</i> = 3.0, 1.3 Hz, 1H), 4.53 (s, 2H), 2.25 (s, 3H). MS (ESI ⁺) : [M+H] ⁺ 339.2.
108		<chem>C16H13N5OS2</chem>	355.43	>98%	Yellow solid. ¹ H NMR (500 MHz, DMSO- <i>d</i> ₆ , 300K) of major tautomer δ _H 11.01 (br s, 1H, NH, D ₂ O exchanged), 9.36 (s, 1H), 8.88 (s, 1H), 8.33 (br s, 1H, NH, D ₂ O exchanged), 8.22 (d, <i>J</i> = 8.5 Hz, 1H), 8.02 (d, <i>J</i> = 8.6 Hz, 1H), 7.18 (s, 1H), 6.49 (s, 1H), 4.84 (s, 2H), 2.36 (s, 3H). MS (ESI ⁺) : [M+H] ⁺ 356.2.
109		<chem>C17H16N6OS</chem>	352.42	>98%	Yellow solid. ¹ H NMR (500 MHz, DMSO- <i>d</i> ₆ , 300K) of major tautomer δ _H 10.86 (br s, 1H, NH, D ₂ O exchanged), 9.36 (s, 1H), 8.86 – 8.71 (m, 1H), 8.39 – 8.20 (m, 1H), 8.05 (d, <i>J</i> = 8.6 Hz, 1H), 7.74 (s, 1H), 7.65 (br s, 1H, NH, D ₂ O exchanged), 7.26 (s, 1H), 6.95 (s, 1H), 6.42 (s, 1H), 4.08 (t, <i>J</i> = 7.0 Hz, 2H), 3.45 – 3.28 (m, 2H), 2.12 – 1.97 (m, 2H). MS (ESI ⁺) : [M+H] ⁺ 353.2.
110		<chem>C18H15N5OS</chem>	349.41	95%	Yellow solid. ¹ H NMR (500 MHz, DMSO- <i>d</i> ₆ , 300K) of major tautomer δ _H 10.67 (br s, 1H, NH, D ₂ O exchanged), 9.36 (s, 1H), 8.87 (s, 1H), 8.54 (d, <i>J</i> = 4.9 Hz, 1H), 8.30 – 8.18 (m, 1H), 8.04 (d, <i>J</i> = 8.6 Hz, 1H), 7.75 (td, <i>J</i> = 7.6, 1.9 Hz, 1H), 7.53 (br s, 1H, NH, D ₂ O exchanged verifier), 7.35 (d, <i>J</i> = 7.8 Hz, 1H), 7.27 – 7.22 (m, 1H), 6.41 (s, 1H), 3.85 – 3.68 (m, 2H), 3.16 – 3.03 (m, 2H). MS (ESI ⁺) : [M+H] ⁺ 350.1.

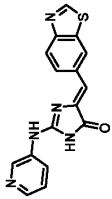
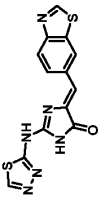
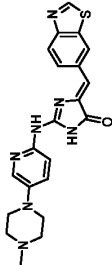
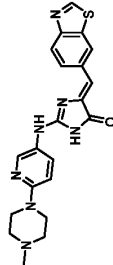
Cpd N°	Structure	Formula	MW	HPLC	Description
111		<chem>C19H13N5OS2</chem>	391.47	98%	Yellow solid. ¹ H NMR (500 MHz, DMSO- <i>d</i> ₆ , 300K) of major tautomer δ _H 11.13 (br s, 1H, NH, D ₂ O exchanged), 9.35 (s, 1H), 8.86 (s, 1H), 8.47 (br s, 1H, NH, D ₂ O exchanged), 8.19 (d, <i>J</i> = 8.5 Hz, 1H), 8.06 (d, <i>J</i> = 8.1 Hz, 1H), 8.00 (t, <i>J</i> = 9.0 Hz, 2H), 7.51 (t, <i>J</i> = 7.6 Hz, 1H), 7.41 (t, <i>J</i> = 7.6 Hz, 1H), 6.50 (s, 1H), 5.12 – 4.91 (m, 2H). MS (ESI ⁺) : [M+H] ⁺ 392.2.
112		<chem>C18H21N5OS</chem>	355.46	92%	Yellow solid. ¹ H NMR (500 MHz, Methanol- <i>d</i> ₄ , 300K) of major tautomer δ _H 9.24 (s, 1H), 8.81 – 7.74 (m, 3H), 6.65 (s, 1H), 3.59 – 3.36 (m, 2H), 3.28 – 3.14 (m, 2H), 2.73 – 2.42 (m, 5H), 2.09 – 1.76 (m, 3H), 1.63 – 1.38 (m, 2H). MS (ESI ⁺) : [M+H] ⁺ 356.2.
113		<chem>C17H18N4O2S</chem>	342.42	97%	Yellow solid. ¹ H NMR (500 MHz, DMSO- <i>d</i> ₆ , 300K) of major tautomer δ _H 10.64 (br s, 1H, NH, D ₂ O exchanged), 9.35 (s, 1H), 8.83 (s, 1H), 8.36 – 8.18 (m, 1H), 8.03 (d, <i>J</i> = 8.5 Hz, 1H), 7.56 (br s, 1H, NH, D ₂ O exchanged), 6.40 (s, 1H), 3.97 – 3.78 (m, 2H), 3.31 – 3.11 (m, 3H), 2.03 – 1.74 (m, 1H), 1.63 (d, <i>J</i> = 13.1 Hz, 2H), 1.43 – 1.10 (m, 3H). MS (ESI ⁺) : [M+H] ⁺ 343.3.
114		<chem>C22H27N5O3S</chem>	441.55	>98%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 300K) of major tautomer δ _H 10.64 (br s, 1H, NH, D ₂ O exchanged), 9.35 (s, 1H), 8.83 (s, 1H), 8.38 – 8.17 (m, 1H), 8.02 (d, <i>J</i> = 8.5 Hz, 1H), 7.56 (br s, 1H, NH, D ₂ O exchanged), 6.40 (s, 1H), 4.15 – 3.81 (m, 2H), 3.31 – 3.01 (m, 2H), 2.90 – 2.57 (m, 2H), 1.96 – 1.60 (m, 3H), 1.39 (s, 9H), 1.19 – 0.94 (m, 2H). MS (ESI ⁺) : [M+H] ⁺ 442.3.

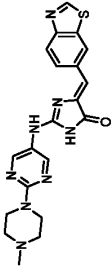
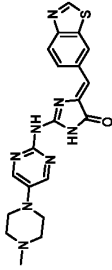
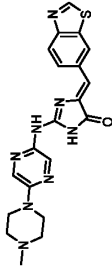
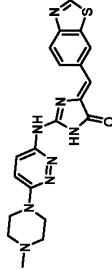
Cpd N°	Structure	Formula	MW	HPLC	Description
115		C ₂₀ H ₂₃ N ₅ OS	381.5	90%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 300K) of major tautomer δ _H 10.22 (br s, 1H, NH, D ₂ O exchanged), 9.33 (s, 1H), 8.93 – 8.64 (m, 1H), 8.33 – 8.09 (m, 1H + NH, D ₂ O exchanged), 8.02 (d, <i>J</i> = 8.1 Hz, 1H), 6.39 (s, 1H), 4.45 – 4.14 (m, 1H), 2.33 – 2.16 (m, 4H), 2.11 (s, 3H), 1.95 – 1.74 (m, 3H), 1.65 – 1.45 (m, 5H). MS (ESI ⁺): [M+H] ⁺ 382.3.
116		C ₁₈ H ₁₃ FN ₄ OS	352.39	>98%	Yellow solid. ¹ H NMR (500 MHz, DMSO- <i>d</i> ₆ , 300K) of major tautomer δ _H 10.89 (s, 1H, NH, D ₂ O exchanged), 10.08 (br s, 1H, NH, D ₂ O exchanged), 9.42 (s, 1H), 8.95 (s, 1H), 8.25 (d, <i>J</i> = 7.0 Hz, 1H), 8.09 (d, <i>J</i> = 8.5 Hz, 1H), 7.92 (d, <i>J</i> = 12.9 Hz, 1H), 7.38 (d, <i>J</i> = 8.2 Hz, 1H), 7.29 (t, <i>J</i> = 8.5 Hz, 1H), 6.68 (s, 1H), 2.23 (s, 3H). MS (ESI ⁺): [M+H] ⁺ 353.1.
117		C ₁₇ H ₁₁ FN ₄ OS	338.37	>98%	Yellow solid. ¹ H NMR (500 MHz, DMSO- <i>d</i> ₆ , 300K) of major tautomer δ _H 10.87 (br s, 1H, NH, D ₂ O exchanged), 9.97 (br s, 1H, NH, D ₂ O exchanged), 9.41 (s, 1H), 8.81 (s, 1H), 8.36 (d, <i>J</i> = 8.9 Hz, 1H), 8.10 (d, <i>J</i> = 8.6 Hz, 1H), 7.91 – 7.76 (m, 2H), 7.26 (t, <i>J</i> = 8.8 Hz, 2H), 6.65 (s, 1H). MS (ESI ⁺): [M+H] ⁺ 339.1.
118		C ₂₃ H ₂₄ N ₄ OS	404.53	>98%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 300K) of major tautomer δ _H 10.76 (br s, 1H, NH, D ₂ O exchanged), 9.85 (br s, 1H, NH, D ₂ O exchanged), 9.41 (s, 1H), 8.85 (s, 1H), 8.49 – 8.24 (m, 1H), 8.22 – 8.02 (m, 1H), 7.90 – 7.54 (m, 2H), 7.37 – 7.11 (m, 2H), 6.63 (s, 1H), 2.67 – 2.53 (m, 2H), 1.72 – 1.47 (m, 2H), 1.29 (s, 6H), 0.87 (s, 3H). MS (ESI ⁺): [M+H] ⁺ 405.3.

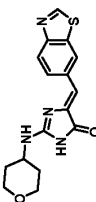
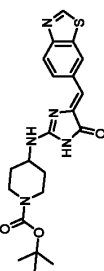
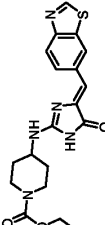
Cpd N°	Structure	Formula	MW	HPLC	Description
119		C ₂₂ H ₂₂ N ₆ O ₂ S	418.52	97%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 300K) of major tautomer δ _H 10.73 (br s, 1H, NH, D ₂ O exchanged), 9.73 (br s, 1H, NH, D ₂ O exchanged), 9.39 (s, 1H), 8.88 – 8.77 (m, 1H), 8.43 – 8.30 (m, 1H), 8.09 (d, <i>J</i> = 8.5 Hz, 1H), 7.73 – 7.53 (m, 2H), 6.99 (d, <i>J</i> = 8.5 Hz, 2H), 6.57 (s, 1H), 3.18 – 3.10 (m, 4H), 2.48 – 2.44 (m, 4H), 2.23 (s, 3H). MS (ESI ⁺) : [M+H] ⁺ 419.2.
120		C ₁₈ H ₁₂ F ₂ N ₄ O ₂ S	386.37	96%	Yellow solid. ¹ H NMR (500 MHz, DMSO- <i>d</i> ₆ , 300K) of major tautomer δ _H 10.87 (br s, 1H, NH, D ₂ O exchanged), 10.19 (br s, 1H, NH, D ₂ O exchanged), 9.42 (s, 1H), 8.88 (s, 1H), 8.37 – 8.27 (m, 1H), 8.17 (s, 1H), 8.06 (d, <i>J</i> = 8.5 Hz, 1H), 7.49 – 7.30 (m, 3H), 6.98 – 6.86 (m, 1H), 6.71 (s, 1H). MS (ESI ⁺) : [M+H] ⁺ 387.1.
121		C ₂₁ H ₁₇ N ₅ O ₂ S	403.47	98%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 300K) of major tautomer δ _H 10.57 (br s, 1H, NH, D ₂ O exchanged), 9.89 (br s, 1H, NH, D ₂ O exchanged), 9.39 (s, 1H), 9.27 – 9.00 (m, 2H), 8.32 – 8.00 (m, 2H), 7.36 – 7.06 (m, 2H), 6.64 (s, 1H), 4.31 – 4.04 (m, 2H), 3.20 – 3.06 (m, 2H), 2.31 (s, 3H). MS (ESI ⁺) : [M+H] ⁺ 404.2.
122		C ₁₈ H ₁₁ F ₃ N ₄ O ₂ S	388.37	95%	Yellow solid. ¹ H NMR (500 MHz, DMSO- <i>d</i> ₆ , 300K) of major tautomer δ _H 11.02 (br s, 1H, NH, D ₂ O exchanged), 10.34 (br s, 1H, NH, D ₂ O exchanged), 9.42 (s, 1H), 8.96 (s, 1H), 8.85 (s, 1H), 8.24 (d, <i>J</i> = 8.5 Hz, 1H), 8.05 (d, <i>J</i> = 8.5 Hz, 1H), 7.75 (d, <i>J</i> = 8.3 Hz, 1H), 7.62 (t, <i>J</i> = 7.8 Hz, 1H), 7.46 (d, <i>J</i> = 7.6 Hz, 1H), 6.74 (s, 1H). MS (ESI ⁺) : [M+H] ⁺ 389.1.

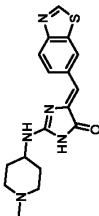
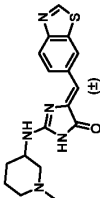
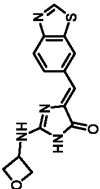
Cpd N°	Structure	Formula	MW	HPLC	Description
123		C ₂₀ H ₁₆ N ₄ O ₂ S	360.44	>98%	Yellow solid. ¹ H NMR (500 MHz, DMSO- <i>d</i> ₆ , 300K) of major tautomer δ _H 10.72 (br s, 1H, NH, D ₂ O exchanged), 9.83 (br s, 1H, NH, D ₂ O exchanged), 9.40 (s, 1H), 9.03 (s, 1H), 8.21 (d, <i>J</i> = 8.5 Hz, 1H), 8.08 (d, <i>J</i> = 8.5 Hz, 1H), 7.93 (s, 1H), 7.38 (d, <i>J</i> = 8.1 Hz, 1H), 7.23 (d, <i>J</i> = 8.1 Hz, 1H), 6.62 (s, 1H), 2.96 (t, <i>J</i> = 7.3 Hz, 2H), 2.86 (t, <i>J</i> = 7.3 Hz, 2H), 2.08 (p, <i>J</i> = 7.4 Hz, 2H). MS (ESI ⁺) : [M+H] ⁺ 361.1.
124		C ₂₁ H ₁₉ N ₅ O ₂ S	405.48	>98%	Yellow solid. ¹ H NMR (500 MHz, DMSO- <i>d</i> ₆ , 300K) of major tautomer δ _H 10.72 (br s, 1H, NH, D ₂ O exchanged), 9.73 (br s, 1H, NH, D ₂ O exchanged), 9.39 (s, 1H), 8.83 (s, 1H), 8.35 (d, <i>J</i> = 8.7 Hz, 1H), 8.09 (d, <i>J</i> = 8.5 Hz, 1H), 7.66 (d, <i>J</i> = 8.2 Hz, 2H), 7.01 (d, <i>J</i> = 8.6 Hz, 2H), 6.58 (s, 1H), 3.81 – 3.72 (m, 4H), 3.15 – 3.06 (m, 4H). MS (ESI ⁺) : [M+H] ⁺ 406.2.
125		C ₁₉ H ₁₄ N ₆ O ₂ S	374.42	97%	Yellow solid. ¹ H NMR (500 MHz, DMSO- <i>d</i> ₆ , 300K) of major tautomer δ _H 11.21 (br s, 1H, NH, D ₂ O exchanged), 10.40 (br s, 1H, NH, D ₂ O exchanged), 9.39 (s, 1H), 8.74 – 8.59 (m, 1H), 8.16 – 7.91 (m, 3H), 7.72 – 7.41 (m, 1H), 7.27 – 6.88 (m, 2H), 6.50 (s, 1H), 4.19 (s, 3H). MS (ESI ⁺) : [M+H] ⁺ 375.1.
126		C ₁₅ H ₁₀ N ₆ O ₂ S	322.35	98%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 300K) of major tautomer δ _H 11.56 (br s, 1H, NH, D ₂ O exchanged), 11.37 (br s, 1H, NH, D ₂ O exchanged), 9.44 (s, 1H), 9.12 – 8.84 (m, 1H), 8.65 (d, <i>J</i> = 4.9 Hz, 2H), 8.42 – 8.25 (m, 1H), 8.12 (d, <i>J</i> = 8.5 Hz, 1H), 7.38 – 7.06 (m, 1H), 6.81 (s, 1H). MS (ESI ⁺) : [M+H] ⁺ 323.2.

Cpd N°	Structure	Formula	MW	HPLC	Description
127		C ₁₆ H ₁₁ N ₅ O ₂ S	321.36	96%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 300K) of major tautomer δ _H 11.20 (br s, 1H, NH, D ₂ O exchanged), 10.97 (br s, 1H, NH, D ₂ O exchanged), 9.43 (s, 1H), 8.88 (s, 1H), 8.49 – 8.26 (m, 2H), 8.12 (d, <i>J</i> = 8.6 Hz, 1H), 7.84 (t, <i>J</i> = 8.0 Hz, 1H), 7.66 – 7.33 (m, 1H), 7.23 – 6.98 (m, 1H), 6.76 (s, 1H). MS (ESI ⁺) : [M+H] ⁺ 322.2.
128		C ₁₅ H ₁₂ N ₆ O ₂ S	324.37	>98%	Pale yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 300K) of major tautomer δ _H 10.58 (br s, 2H, NH, D ₂ O exchanged), 9.40 (s, 1H), 8.81 (s, 1H), 8.48 – 8.03 (m, 2H), 7.80 – 7.63 (m, 1H), 6.61 (s, 1H), 6.49 – 6.23 (m, 1H), 3.80 (s, 3H). MS (ESI ⁺) : [M+H] ⁺ 325.1.
129		C ₁₈ H ₁₅ N ₅ O ₂ S	365.41	98%	Yellow solid. ¹ H NMR (500 MHz, DMSO- <i>d</i> ₆ , 300K) of major tautomer δ _H 10.30 (br s, 1H, NH, D ₂ O exchanged), 9.42 (s, 1H), 9.06 (br s, 1H, NH, D ₂ O exchanged), 8.90 – 8.72 (m, 1H), 8.72 – 8.54 (m, 1H), 8.44 – 8.23 (m, 1H), 8.11 (d, <i>J</i> = 8.5 Hz, 1H), 6.99 (d, <i>J</i> = 7.7 Hz, 1H), 6.69 (s, 1H), 3.99 (s, 3H), 2.41 (s, 3H). MS (ESI ⁺) : [M+H] ⁺ 366.2.
130		C ₁₅ H ₁₀ N ₆ O ₂ S	322.35	>98%	Yellow solid. ¹ H NMR (500 MHz, DMSO- <i>d</i> ₆ , 300K) of major tautomer δ _H 11.30 (br s, 1H, NH, D ₂ O exchanged), 10.37 (br s, 1H, NH, D ₂ O exchanged), 9.42 (s, 1H), 9.41 – 9.02 (m, 2H), 8.92 (s, 1H), 8.88 – 8.69 (m, 1H), 8.45 – 8.17 (m, 1H), 8.10 (d, <i>J</i> = 8.5 Hz, 1H), 6.93 – 6.49 (m, 1H). MS (ESI ⁺) : [M+H] ⁺ 323.1.

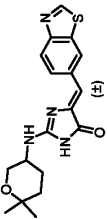
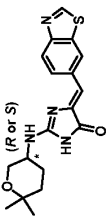
Cpd N°	Structure	Formula	MW	HPLC	Description
131		$C_{16}H_{11}N_5OS$	321.36	>98%	Yellow solid. 1H NMR (400 MHz, DMSO- d_6 , 300K) of major tautomer δ_H 11.03 (br s, 1H, NH, D $_2$ O exchanged), 10.16 (br s, 1H, NH, D $_2$ O exchanged), 9.42 (s, 1H), 9.06 – 8.90 (m, 1H), 8.87 – 8.78 (m, 1H), 8.44 – 8.21 (m, 3H), 8.11 (d, J = 8.5 Hz, 1H), 7.49 – 7.41 (m, 1H), 6.70 (s, 1H). MS (ESI $^+$) : [M+H] $^+$ 322.2.
132		$C_{13}H_8N_6OS_2$	328.37	95%	Yellow solid. 1H NMR (400 MHz, DMSO- d_6 , 300K) of major tautomer δ_H 12.52 (br s, 1H, NH, D $_2$ O exchanged), 11.38 (br s, 1H, NH, D $_2$ O exchanged), 9.44 (s, 1H), 9.18 – 9.03 (m, 1H), 8.87 – 8.71 (m, 1H), 8.53 – 8.24 (m, 1H), 8.15 (d, J = 8.4 Hz, 1H), 6.76 (s, 1H). MS (ESI $^+$) : [M+H] $^+$ 329.2.
133		$C_{21}H_{21}N_7OS$	419.51	95%	Yellow solid. 1H NMR (400 MHz, DMSO- d_6 , 300K) of major tautomer δ_H 11.02 (br s, 1H, NH, D $_2$ O exchanged), 10.78 (br s, 1H, NH, D $_2$ O exchanged), 9.42 (s, 1H), 8.99 – 8.65 (m, 1H), 8.47 – 8.22 (m, 1H), 8.20 – 8.06 (m, 1H), 8.01 (s, 1H), 7.60 – 7.49 (m, 1H), 7.48 – 7.22 (m, 1H), 6.67 (s, 1H), 3.23 – 3.06 (m, 4H), 2.62 – 2.52 (m, 4H), 2.28 (s, 3H). MS (ESI $^+$) : [M+H] $^+$ 420.3.
134		$C_{21}H_{21}N_7OS$	419.51	>98%	Yellow solid. 1H NMR (400 MHz, DMSO- d_6 , 300K) of major tautomer δ_H 10.92 (br s, 1H, NH, D $_2$ O exchanged), 9.79 (br s, 1H, NH, D $_2$ O exchanged), 9.39 (s, 1H), 8.87 – 8.72 (m, 1H), 8.50 – 8.37 (m, 1H), 8.36 – 8.23 (m, 1H), 8.08 (d, J = 8.5 Hz, 1H), 8.04 – 7.90 (m, 1H), 6.92 (d, J = 9.1 Hz, 1H), 6.57 (s, 1H), 3.53 – 3.43 (m, 4H), 2.45 – 2.39 (m, 4H), 2.23 (s, 3H). MS (ESI $^+$) : [M+H] $^+$ 420.3.

Cpd N°	Structure	Formula	MW	HPLC	Description
135		C ₂₀ H ₂₀ N ₈ OS	420.50	>98%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 300K) of major tautomer δ _H 11.12 (br s, 1H, NH, D ₂ O exchanged), 9.79 (br s, 1H, NH, D ₂ O exchanged), 9.39 (s, 1H), 8.93 – 8.52 (m, 3H), 8.32 – 8.16 (m, 1H), 8.06 (d, <i>J</i> = 8.6 Hz, 1H), 6.58 (s, 1H), 3.86 – 3.65 (m, 4H), 2.48 – 2.36 (m, 4H), 2.26 (s, 3H). MS (ESI ⁺) : [M+H] ⁺ 421.2.
136		C ₂₀ H ₂₀ N ₈ OS	420.50	>98%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 373K) of major tautomer δ _H 11.00 (br s, 2H, NH, D ₂ O exchanged), 9.35 (s, 1H), 8.79 (s, 1H), 8.38 (s, 2H), 8.25 – 7.98 (m, 2H), 6.72 (s, 1H), 3.26 – 3.17 (m, 4H), 2.54 – 2.51 (m, 4H), 2.27 (s, 3H). MS (ESI ⁺) : [M+H] ⁺ 421.2.
137		C ₂₀ H ₂₀ N ₈ OS	420.50	>98%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 300K) of major tautomer δ _H 11.35 (br s, 1H, NH, D ₂ O exchanged), 10.82 (br s, 1H, NH, D ₂ O exchanged), 9.42 (s, 1H), 9.01 – 7.83 (m, 5H), 6.64 (s, 1H), 3.60 – 3.44 (m, 4H), 2.48 – 2.41 (m, 4H), 2.24 (s, 3H). MS (ESI ⁺) : [M+H] ⁺ 421.2.
138		C ₂₀ H ₂₀ N ₈ OS	420.50	>98%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 323K) of major tautomer δ _H 10.99 (br s, 2H, NH, D ₂ O exchanged), 9.40 (s, 1H), 8.76 – 8.59 (m, 1H), 8.25 – 8.00 (m, 2H), 7.71 – 7.53 (m, 1H), 7.47 (d, <i>J</i> = 9.7 Hz, 1H), 6.68 (s, 1H), 3.60 – 3.48 (m, 4H), 2.48 – 2.42 (m, 4H), 2.25 (s, 3H). MS (ESI ⁺) : [M+H] ⁺ 421.2.

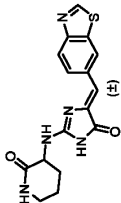
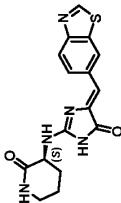
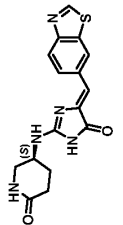
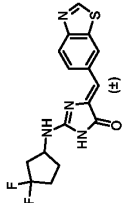
Cpd N°	Structure	Formula	MW	HPLC	Description
139		C ₁₆ H ₁₆ N ₄ O ₂ S	328.40	95%	Yellow solid. ¹ H NMR (500 MHz, DMSO- <i>d</i> ₆ , 300K) of major tautomer δ _H 10.68 (br s, 1H, NH, D ₂ O exchanged), 9.35 (s, 1H), 8.81 (s, 1H), 8.37 – 8.21 (m, 1H), 8.03 (d, <i>J</i> = 8.7 Hz, 1H), 7.66 (br s, 1H, NH, D ₂ O exchanged), 6.41 (s, 1H), 4.21 – 3.70 (m, 3H), 3.55 – 3.33 (m, 2H), 2.00 – 1.79 (m, 2H), 1.67 – 1.50 (m, 2H). MS (ESI ⁺) : [M+H] ⁺ 329.2.
140		C ₂₁ H ₂₅ N ₅ O ₃ S	427.52	>98%	Yellow solid. ¹ H NMR (500 MHz, DMSO- <i>d</i> ₆ , 300K) of major tautomer δ _H 10.66 (br s, 1H, NH, D ₂ O exchanged), 9.35 (s, 1H), 8.81 (s, 1H), 8.32 – 8.13 (m, 1H), 8.02 (d, <i>J</i> = 8.6 Hz, 1H), 7.62 (br s, 1H, NH, D ₂ O exchanged), 6.42 (s, 1H), 4.22 – 3.66 (m, 3H), 3.08 – 2.73 (m, 2H), 2.00 – 1.79 (m, 2H), 1.54 – 1.30 (m, 11H). MS (ESI ⁺) : [M+H] ⁺ 428.3.
141		C ₁₉ H ₂₁ N ₅ O ₃ S	399.47	>98%	Yellow solid. ¹ H NMR (500 MHz, DMSO- <i>d</i> ₆ , 300K) of major tautomer δ _H 10.79 (br s, 1H, NH, D ₂ O exchanged), 9.36 (s, 1H), 8.81 (s, 1H), 8.45 – 8.16 (m, 1H), 8.13 – 7.95 (m, 1H), 7.68 (br s, 1H, NH, D ₂ O exchanged), 6.42 (s, 1H), 4.19 – 3.77 (m, 5H), 3.17 – 2.82 (m, 2H), 2.12 – 1.79 (m, 2H), 1.60 – 1.33 (m, 2H), 1.20 (t, <i>J</i> = 6.8 Hz, 3H). MS (ESI ⁺) : [M+H] ⁺ 400.2.

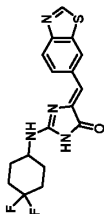
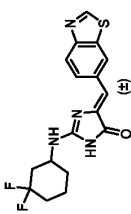
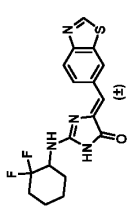
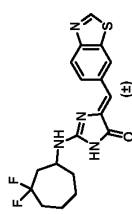
Cpd N°	Structure	Formula	MW	HPLC	Description
142		C ₁₇ H ₁₉ N ₅ OS	341.43	96%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 300K) of major tautomer δ _H 9.74 (br s, 1H, NH, D ₂ O exchanged), 9.34 (s, 1H), 8.82 – 8.66 (m, 1H), 8.36 – 8.09 (m, 1H), 8.03 (d, <i>J</i> = 8.4 Hz, 1H), 7.78 (br s, 1H, NH, D ₂ O exchanged), 6.40 (s, 1H), 3.89 – 3.56 (m, 1H), 2.81 – 2.62 (m, 2H), 2.16 (s, 3H), 2.01 (s, 2H), 1.94 – 1.82 (m, 2H), 1.64 – 1.50 (m, 2H). MS (ESI ⁺) : [M+H] ⁺ 342.2.
143		C ₁₇ H ₁₉ N ₅ OS	341.43	>98%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 300K) of major tautomer δ _H 10.59 (br s, 1H, NH, D ₂ O exchanged), 9.36 (s, 1H), 8.80 (s, 1H), 8.43 – 8.18 (m, 1H), 8.04 (d, <i>J</i> = 8.5 Hz, 1H), 7.68 (br s, 1H, NH, D ₂ O exchanged), 6.44 (s, 1H), 4.40 – 3.95 (m, 1H), 3.15 – 2.96 (m, 2H), 2.47 – 2.28 (m, 3H), 1.94 – 1.43 (m, 4H), 1.18 (t, <i>J</i> = 7.3 Hz, 2H). MS (ESI ⁺) : [M+H] ⁺ 342.2.
144		C ₁₄ H ₁₂ N ₄ O ₂ S	300.34	>98%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 302K) of major tautomer δ _H 10.92 (br s, 1H, NH, D ₂ O exchanged), 9.37 (s, 1H), 8.92 – 8.73 (m, 1H), 8.44 (br s, 1H, NH, D ₂ O exchanged), 8.31 – 8.16 (m, 1H), 8.04 (d, <i>J</i> = 8.5 Hz, 1H), 6.46 (s, 1H), 5.19 – 4.93 (m, 1H), 4.90 – 4.73 (m, 2H), 4.72 – 4.54 (m, 2H). MS (ESI ⁺) : [M+H] ⁺ 301.1.

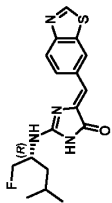
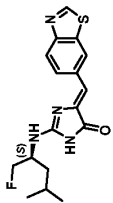
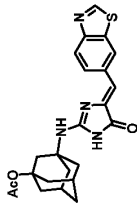
Cpd N°	Structure	Formula	MW	HPLC	Description
145		$C_{15}H_{14}N_4O_2S$	314.36	>98%	Yellow solid. 1H NMR (400 MHz, DMSO- d_6 , 300K) of major tautomer δ_H 10.71 (br s, 1H, NH, D $_2$ O exchanged), 9.36 (s, 1H), 8.81 (s, 1H), 8.28 (d, J = 8.7 Hz, 1H), 8.04 (d, J = 8.6 Hz, 1H), 7.97 (br s, 1H, NH, D $_2$ O exchanged), 6.44 (s, 1H), 4.48 (s, 1H), 4.00 – 3.80 (m, 2H), 3.80 – 3.69 (m, 1H), 3.69 – 3.59 (m, 1H), 2.30 – 2.17 (m, 1H), 2.01 – 1.85 (m, 1H). MS (ESI $^+$) : [M+H] $^+$ 315.2.
146		$C_{15}H_{14}N_4O_2S$	314.36	>98%	Yellow solid. 1H NMR (400 MHz, DMSO- d_6 , 300K) of major tautomer δ_H 10.71 (br s, 1H, NH, D $_2$ O exchanged), 9.36 (s, 1H), 8.81 (s, 1H), 8.28 (d, J = 8.7 Hz, 1H), 8.04 (d, J = 8.6 Hz, 1H), 7.97 (br s, 1H, NH, D $_2$ O exchanged), 6.44 (s, 1H), 4.48 (s, 1H), 4.00 – 3.80 (m, 2H), 3.80 – 3.69 (m, 1H), 3.69 – 3.59 (m, 1H), 2.30 – 2.17 (m, 1H), 2.01 – 1.85 (m, 1H). MS (ESI $^+$) : [M+H] $^+$ 315.2.
147		$C_{16}H_{16}N_4O_2S$	328.39	>98%	Yellow solid. 1H NMR (400 MHz, DMSO- d_6 , 300K) of major tautomer δ_H 10.45 (br s, 1H, NH, D $_2$ O exchanged), 9.36 (s, 1H), 8.77 (s, 1H), 8.28 (s, 1H), 8.04 (d, J = 8.6 Hz, 1H), 7.62 (br s, 1H, NH, D $_2$ O exchanged), 6.43 (s, 1H), 4.18 – 3.36 (m, 5H), 2.09 – 1.88 (m, 1H), 1.81 – 1.46 (m, 3H). MS (ESI $^+$) : [M+H] $^+$ 329.2.
148		$C_{16}H_{16}N_4O_2S$	328.39	>98%	Yellow solid. 1H NMR (400 MHz, DMSO- d_6 , 300K) of major tautomer δ_H 10.45 (br s, 1H, NH, D $_2$ O exchanged), 9.36 (s, 1H), 8.77 (s, 1H), 8.28 (s, 1H), 8.04 (d, J = 8.6 Hz, 1H), 7.62 (br s, 1H, NH, D $_2$ O exchanged), 6.43 (s, 1H), 4.18 – 3.36 (m, 5H), 2.09 – 1.88 (m, 1H), 1.81 – 1.46 (m, 3H). MS (ESI $^+$) : [M+H] $^+$ 329.2.

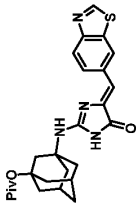
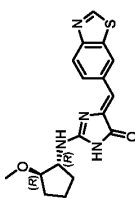
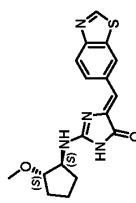
Cpd N°	Structure	Formula	MW	HPLC	Description
149		$C_{18}H_{20}N_4O_2S$	356.44	>98%	Yellow solid. 1H NMR (400 MHz, DMSO- d_6 , 373K) of major tautomer δ_H 10.20 (br s, 1H, NH, D ₂ O exchanged), 9.28 (s, 1H), 8.89 – 8.64 (m, 1H), 8.33 – 8.11 (m, 1H), 8.02 (d, J = 8.4 Hz, 1H), 7.14 (br s, 1H, NH, D ₂ O exchanged), 6.45 (s, 1H), 3.95 – 3.72 (m, 2H), 3.62 – 3.49 (m, 1H), 2.01 – 1.76 (m, 2H), 1.73 – 1.60 (m, 1H), 1.58 – 1.46 (m, 1H), 1.29 – 1.15 (m, 6H). MS (ESI ⁺) : [M+H] ⁺ 357.2. Anal. chiral SFC: Amy-C (4.6 mm x 250 mm, 5 μ m), (40 °C, 4 mL/min, 210-400 nm, inj. vol.: 1 μ L; isocratic conditions: 1/1 (MeOH/CO ₂ (0.2% v/v NH ₃)), t_R (149A): 1.21 min, t_R (149B): 1.52 min.
149A		$C_{18}H_{20}N_4O_2S$	356.44	>98%	Yellow solid. 1H NMR (400 MHz, DMSO- d_6 , 373K) of major tautomer δ_H 10.20 (br s, 1H, NH, D ₂ O exchanged), 9.28 (s, 1H), 8.89 – 8.64 (m, 1H), 8.33 – 8.11 (m, 1H), 8.02 (d, J = 8.4 Hz, 1H), 7.14 (br s, 1H, NH, D ₂ O exchanged), 6.45 (s, 1H), 3.95 – 3.72 (m, 2H), 3.62 – 3.49 (m, 1H), 2.01 – 1.76 (m, 2H), 1.73 – 1.60 (m, 1H), 1.58 – 1.46 (m, 1H), 1.29 – 1.15 (m, 6H). MS (ESI ⁺) : [M+H] ⁺ 357.2. Prep. chiral SFC from 149 : Lux A1 (21.2 mm x 250 mm, 5 μ m), (40 °C, 50 mL/min, 210 nm, inj. vol.: 1300 μ L (19.5 mg); isocratic conditions: 1/1 (MeOH/CO ₂). Anal. chiral SFC: same conditions as 149 . t_R (149A): 1.21 min, ee = >99%.

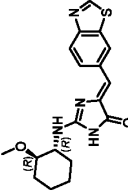
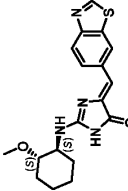
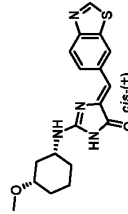
Cpd N°	Structure	Formula	MW	HPLC	Description
149B		$C_{18}H_{20}N_4O_2S$	356.44	>98%	Yellow solid. 1H NMR (400 MHz, DMSO- d_6 , 373K) of major tautomer δ_H 10.20 (br s, 1H, NH, D ₂ O exchanged), 9.28 (s, 1H), 8.89 – 8.64 (m, 1H), 8.33 – 8.11 (m, 1H), 8.02 (d, J = 8.4 Hz, 1H), 7.14 (br s, 1H, NH, D ₂ O exchanged), 6.45 (s, 1H), 3.95 – 3.72 (m, 2H), 3.62 – 3.49 (m, 1H), 2.01 – 1.76 (m, 2H), 1.73 – 1.60 (m, 1H), 1.58 – 1.46 (m, 1H), 1.29 – 1.15 (m, 6H). MS (ESI ⁺) : [M+H] ⁺ 357.2. Prep. chiral SFC from 149 : Lux A1 (21.2 mm x 250 mm, 5 μ m), (40 °C, 50 mL/min, 210 nm, inj. vol.: 1300 μ L (19.5 mg); isocratic conditions: 1/1 (MeOH/CO ₂). Anal. chiral SFC: same conditions as 149 . t_R (149B): 1.51 min, ee = >99%.
150		$C_{16}H_{16}N_4O_3S$	344.39	97%	Yellow solid. 1H NMR (400 MHz, DMSO- d_6 , 343K) of major tautomer δ_H 10.12 (br s, 1H, NH, D ₂ O exchanged), 9.32 (s, 1H), 8.89 – 8.54 (m, 1H), 8.34 – 8.08 (m, 1H), 8.04 (d, J = 8.4 Hz, 1H), 7.36 (br s, 1H, NH, D ₂ O exchanged), 6.45 (s, 1H), 4.96 (br s, 1H, OH, D ₂ O exchanged), 4.01 (d, J = 11.2 Hz, 1H), 3.93 – 3.79 (m, 1H), 3.78 – 3.58 (m, 2H), 3.41 (t, J = 10.7 Hz, 1H), 3.33 – 3.20 (m, 1H), 1.94 (d, J = 13.3 Hz, 1H), 1.63 – 1.47 (m, 1H). MS (ESI ⁺) : [M+H] ⁺ 345.2.
151		$C_{17}H_{18}N_4O_2S$	342.42	>98%	Yellow solid. 1H NMR (400 MHz, DMSO- d_6 , 300K) of major tautomer δ_H 10.31 (br s, 1H, NH, D ₂ O exchanged), 9.35 (s, 1H), 8.79 (s, 1H), 8.35 – 8.17 (m, 1H), 8.03 (d, J = 8.6 Hz, 1H), 7.51 (br s, 1H, NH, D ₂ O exchanged), 6.42 (s, 1H), 4.32 – 3.99 (m, 1H), 3.89 – 3.53 (m, 4H), 1.96 – 1.50 (m, 6H). MS (ESI ⁺) : [M+H] ⁺ 343.2.

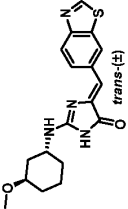
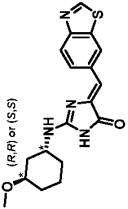
Cpd N°	Structure	Formula	MW	HPLC	Description
152		$C_{16}H_{15}N_5O_2S$	341.39	>98%	Yellow solid. 1H NMR (400 MHz, DMSO- d_6 , 300K) of major tautomer δ_H 10.75 (br s, 1H, NH, D $_2$ O exchanged), 9.36 (s, 1H), 8.84 (s, 1H), 8.23 (d, J = 8.6 Hz, 1H), 8.03 (d, J = 8.5 Hz, 1H), 7.78 (br s, 2H, NH, D $_2$ O exchanged), 6.43 (s, 1H), 4.49 – 4.16 (m, 1H), 3.28 – 3.12 (m, 2H), 2.30 – 2.09 (m, 1H), 1.88 (s, 3H). MS (ESI $^+$) : [M+H] $^+$ 342.2.
153		$C_{16}H_{15}N_5O_2S$	341.39	>98%	Yellow solid. 1H NMR (400 MHz, DMSO- d_6 , 300K) of major tautomer δ_H 10.75 (br s, 1H, NH, D $_2$ O exchanged), 9.36 (s, 1H), 8.84 (s, 1H), 8.23 (d, J = 8.6 Hz, 1H), 8.03 (d, J = 8.5 Hz, 1H), 7.78 (br s, 2H, NH, D $_2$ O exchanged), 6.43 (s, 1H), 4.49 – 4.16 (m, 1H), 3.28 – 3.12 (m, 2H), 2.30 – 2.09 (m, 1H), 1.88 (s, 3H). MS (ESI $^+$) : [M+H] $^+$ 342.2.
154		$C_{16}H_{15}N_5O_2S$	341.39	>98%	Yellow solid. 1H NMR (400 MHz, DMSO- d_6 , 300K) of major tautomer δ_H 10.76 (br s, 1H, NH, D $_2$ O exchanged), 9.36 (s, 1H), 8.82 (s, 1H), 8.40 – 8.20 (m, 1H), 8.09 – 8.00 (m, 1H), 7.79 (br s, 1H, NH, D $_2$ O exchanged), 7.52 (br s, 1H, NH, D $_2$ O exchanged), 6.44 (s, 1H), 4.38 – 3.73 (m, 1H), 3.58 – 3.39 (m, 2H), 2.36 – 1.78 (m, 4H). MS (ESI $^+$) : [M+H] $^+$ 342.2.
155		$C_{16}H_{14}F_2N_4OS$	348.37	>98%	Yellow solid. 1H NMR (400 MHz, DMSO- d_6 , 323K) of major tautomer δ_H 10.69 (br s, 1H, NH, D $_2$ O exchanged), 9.34 (s, 1H), 8.91 – 8.66 (m, 1H), 8.35 – 8.11 (m, 1H), 8.03 (d, J = 8.5 Hz, 1H), 7.81 (br s, 1H, NH, D $_2$ O exchanged), 6.46 (s, 1H), 4.54 – 4.31 (m, 1H), 2.70 – 2.53 (m, 1H), 2.38 – 2.03 (m, 4H), 1.97 – 1.83 (m, 1H). MS (ESI $^+$) : [M+H] $^+$ 349.2.

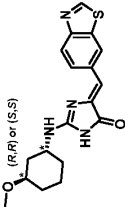
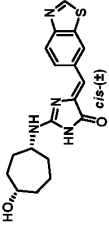
Cpd N°	Structure	Formula	MW	HPLC	Description
156		$C_{17}H_{16}F_2N_4OS$	362.40	>98%	Yellow solid. 1H NMR (400 MHz, DMSO- d_6 , 323K) of major tautomer δ_H 10.67 (br s, 1H, NH, D ₂ O exchanged), 9.34 (s, 1H), 8.97 – 8.65 (m, 1H), 8.42 – 8.16 (m, 1H), 8.03 (d, J = 8.5 Hz, 1H), 7.67 (br s, 1H, NH, D ₂ O exchanged), 6.44 (s, 1H), 4.02 – 3.80 (m, 1H), 2.19 – 1.85 (m, 6H), 1.82 – 1.63 (m, 2H). MS (ESI ⁺) : [M+H] ⁺ 363.1.
157		$C_{17}H_{16}F_2N_4OS$	362.40	>98%	Yellow solid. 1H NMR (400 MHz, DMSO- d_6 , 300K) of major tautomer δ_H 10.76 (br s, 1H, NH, D ₂ O exchanged), 9.36 (s, 1H), 8.98 – 8.75 (m, 1H), 8.37 – 8.12 (m, 1H), 8.03 (d, J = 8.5 Hz, 1H), 7.70 (br s, 1H, NH, D ₂ O exchanged), 6.45 (s, 1H), 4.21 – 3.82 (m, 1H), 2.48 – 2.28 (m, 1H), 2.09 – 1.68 (m, 5H), 1.61 – 1.36 (m, 2H). MS (ESI ⁺) : [M+H] ⁺ 363.1.
158		$C_{17}H_{16}F_2N_4OS$	362.40	>98%	Yellow solid. 1H NMR (400 MHz, DMSO- d_6 , 323K) of major tautomer δ_H 10.46 (br s, 1H, NH, D ₂ O exchanged), 9.35 (s, 1H), 8.93 – 8.67 (m, 1H), 8.43 – 8.14 (m, 1H), 8.04 (d, J = 8.4 Hz, 1H), 7.80 (br s, 1H, NH, D ₂ O exchanged), 6.48 (s, 1H), 4.43 – 4.12 (m, 1H), 2.21 – 2.08 (m, 1H), 2.05 – 1.38 (m, 7H). MS (ESI ⁺) : [M+H] ⁺ 363.2.
159		$C_{18}H_{18}F_2N_4OS$	376.43	>98%	Yellow solid. 1H NMR (400 MHz, DMSO- d_6 , 323K) of major tautomer δ_H 10.52 (br s, 1H, NH, D ₂ O exchanged), 9.33 (s, 1H), 9.11 – 8.85 (m, 1H), 8.30 – 8.09 (m, 1H), 8.01 (d, J = 8.5 Hz, 1H), 7.54 (br s, 1H, NH, D ₂ O exchanged), 6.46 (s, 1H), 4.19 – 3.99 (m, 1H), 2.70 – 2.52 (m, 1H), 2.45 – 2.26 (m, 1H), 2.25 – 1.96 (m, 3H), 1.85 – 1.50 (m, 5H). MS (ESI ⁺) : [M+H] ⁺ 377.2.

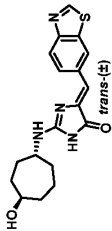
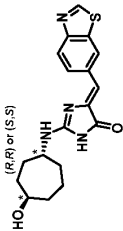
Cpd N°	Structure	Formula	MW	HPLC	Description
160		C ₁₇ H ₁₉ FN ₄ O ₃ S	346.42	95%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 373K) of major tautomer δ _H 10.28 (br s, 1H, NH, D ₂ O exchanged), 9.28 (s, 1H), 8.85 (s, 1H), 8.17 (d, <i>J</i> = 8.2 Hz, 1H), 8.00 (d, <i>J</i> = 8.5 Hz, 1H), 7.25 (br s, 1H, NH, D ₂ O exchanged), 6.46 (s, 1H), 4.64 – 4.52 (m, 1H), 4.50 – 4.40 (m, 1H), 4.37 – 4.22 (m, 1H), 1.84 – 1.71 (m, 1H), 1.65 – 1.55 (m, 1H), 1.52 – 1.41 (m, 1H), 1.04 – 0.81 (m, 6H). MS (ESI ⁺) : [M+H] ⁺ 347.2.
161		C ₁₇ H ₁₉ FN ₄ O ₃ S	346.42	>98%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 373K) of major tautomer δ _H 10.28 (br s, 1H, NH, D ₂ O exchanged), 9.28 (s, 1H), 8.85 (s, 1H), 8.17 (d, <i>J</i> = 8.2 Hz, 1H), 8.00 (d, <i>J</i> = 8.5 Hz, 1H), 7.25 (br s, 1H, NH, D ₂ O exchanged), 6.46 (s, 1H), 4.64 – 4.52 (m, 1H), 4.50 – 4.40 (m, 1H), 4.37 – 4.22 (m, 1H), 1.84 – 1.71 (m, 1H), 1.65 – 1.55 (m, 1H), 1.52 – 1.41 (m, 1H), 1.04 – 0.81 (m, 6H). MS (ESI ⁺) : [M+H] ⁺ 347.2.
162		C ₂₃ H ₂₄ N ₄ O ₃ S	436.53	97%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 300K) of major tautomer δ _H 10.09 (br s, 1H, NH, D ₂ O exchanged), 9.34 (s, 1H), 9.03 (s, 1H), 8.13 (d, <i>J</i> = 8.5 Hz, 1H), 8.03 (d, <i>J</i> = 8.5 Hz, 1H), 7.29 (br s, 1H, NH, D ₂ O exchanged), 6.43 (s, 1H), 2.67 (s, 2H), 2.35 – 2.00 (m, 8H), 1.99 – 1.88 (m, 5H), 1.66 – 1.54 (m, 2H). MS (ESI ⁺) : [M+H] ⁺ 437.3.

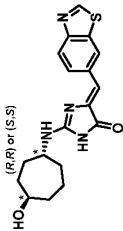
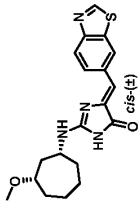
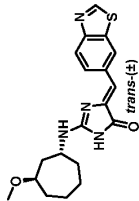
Cpd N°	Structure	Formula	MW	HPLC	Description
163		<chem>C26H30N4O3S</chem>	478.61	98%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 373K) of major tautomer δ _H 9.84 (br s, 1H, NH, D ₂ O exchanged), 9.31 (s, 1H), 9.01 (s, 1H), 8.12 (dd, <i>J</i> = 8.7, 1.7 Hz, 1H), 8.01 (d, <i>J</i> = 8.5 Hz, 1H), 7.00 (br s, 1H, NH, D ₂ O exchanged), 6.45 (s, 1H), 2.68 (s, 2H), 2.39 – 1.90 (m, 10H), 1.69 – 1.58 (m, 2H), 1.12 (s, 9H). MS (ESI ⁺) : [M+H] ⁺ 479.4.
164		<chem>C17H18N4O2S</chem>	342.42	>98%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 343K) of major tautomer δ _H 10.12 (br s, 1H, NH, D ₂ O exchanged), 9.28 (s, 1H), 8.97 – 8.76 (m, 1H), 8.25 – 8.09 (m, 1H), 8.01 (d, <i>J</i> = 8.3 Hz, 1H), 7.28 (br s, 1H, NH, D ₂ O exchanged), 6.46 (s, 1H), 4.21 – 4.12 (m, 1H), 3.86 – 3.79 (m, 1H), 3.38 (s, 3H), 2.17 – 2.04 (m, 1H), 2.00 – 1.88 (m, 1H), 1.80 – 1.58 (m, 4H). MS (ESI ⁺) : [M+H] ⁺ 343.2.
165		<chem>C17H18N4O2S</chem>	342.42	>98%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 343K) of major tautomer δ _H 10.12 (br s, 1H, NH, D ₂ O exchanged), 9.28 (s, 1H), 8.97 – 8.76 (m, 1H), 8.25 – 8.09 (m, 1H), 8.01 (d, <i>J</i> = 8.3 Hz, 1H), 7.28 (br s, 1H, NH, D ₂ O exchanged), 6.46 (s, 1H), 4.21 – 4.12 (m, 1H), 3.86 – 3.79 (m, 1H), 3.38 (s, 3H), 2.17 – 2.04 (m, 1H), 2.00 – 1.88 (m, 1H), 1.80 – 1.58 (m, 4H). MS (ESI ⁺) : [M+H] ⁺ 343.2.

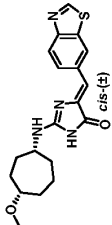
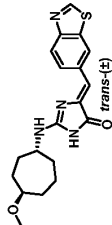
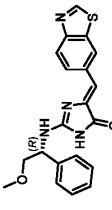
Cpd N°	Structure	Formula	MW	HPLC	Description
166		C ₁₈ H ₂₀ N ₄ O ₂ S	356.44	>98%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 323K) of major tautomer δ _H 10.62 (br s, 1H, NH, D ₂ O exchanged), 9.32 (s, 1H), 8.84 (s, 1H), 8.20 (d, <i>J</i> = 8.7 Hz, 1H), 8.01 (d, <i>J</i> = 8.6 Hz, 1H), 7.65 (br s, 1H, NH, D ₂ O exchanged), 6.39 (s, 1H), 3.82 – 3.53 (m, 1H), 3.31 (s, 3H), 3.25 – 3.12 (m, 1H), 2.15 – 1.90 (m, 2H), 1.76 – 1.59 (m, 2H), 1.47 – 1.15 (m, 4H). MS (ESI ⁺) : [M+H] ⁺ 357.2.
167		C ₁₈ H ₂₀ N ₄ O ₂ S	356.44	>98%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 323K) of major tautomer δ _H 10.62 (br s, 1H, NH, D ₂ O exchanged), 9.32 (s, 1H), 8.84 (s, 1H), 8.20 (d, <i>J</i> = 8.7 Hz, 1H), 8.01 (d, <i>J</i> = 8.6 Hz, 1H), 7.65 (br s, 1H, NH, D ₂ O exchanged), 6.39 (s, 1H), 3.82 – 3.53 (m, 1H), 3.31 (s, 3H), 3.25 – 3.12 (m, 1H), 2.15 – 1.90 (m, 2H), 1.76 – 1.59 (m, 2H), 1.47 – 1.15 (m, 4H). MS (ESI ⁺) : [M+H] ⁺ 357.2.
168		C ₁₈ H ₂₀ N ₄ O ₂ S	356.44	>98%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 373K) of major tautomer δ _H 10.29 (br s, 1H, NH, D ₂ O exchanged), 9.28 (s, 1H), 9.00 – 8.58 (m, 1H), 8.34 – 8.07 (m, 1H), 8.02 (d, <i>J</i> = 8.2 Hz, 1H), 7.19 (br s, 1H, NH, D ₂ O exchanged), 6.43 (s, 1H), 3.87 – 3.74 (m, 1H), 3.36 – 3.22 (m, 4H), 2.39 – 2.24 (m, 1H), 1.99 – 1.72 (m, 3H), 1.41 – 1.15 (m, 4H). MS (ESI ⁺) : [M+H] ⁺ 357.2.

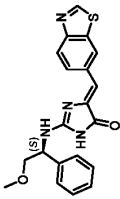
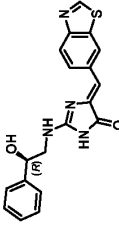
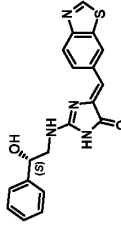
Cpd N°	Structure	Formula	MW	HPLC	Description
169		$C_{18}H_{20}N_4O_2S$	356.44	>98%	Yellow solid. 1H NMR (400 MHz, DMSO- d_6 , 323K) of major tautomer δ_H 10.40 (br s, 1H, NH, D ₂ O exchanged), 9.33 (s, 1H), 8.99 – 8.76 (m, 1H), 8.31 – 8.11 (m, 1H), 8.02 (d, J = 8.5 Hz, 1H), 7.39 (br s, 1H, NH, D ₂ O exchanged), 6.41 (s, 1H), 4.14 – 3.91 (m, 1H), 3.65 – 3.53 (m, 1H), 3.35 (s, 3H), 2.34 – 2.04 (m, 1H), 1.93 – 1.81 (m, 1H), 1.76 – 1.35 (m, 6H). MS (ESI ⁺): [M+H] ⁺ 357.2. Anal. chiral SFC: Lux A2 (4.6 mm x 250 mm, 5 μ m), (40 °C, 4 mL/min, 210–400 nm, inj. vol.: 1 μ L; isocratic conditions: 25/75 (MeOH/CO ₂ 0.2% v/v NH ₃)), t_R (169A): 5.06 min, t_R (169B): 6.27 min.
169A		$C_{18}H_{20}N_4O_2S$	356.44	>98%	Yellow solid. 1H NMR (400 MHz, DMSO- d_6 , 323K) of major tautomer δ_H 10.40 (br s, 1H, NH, D ₂ O exchanged), 9.33 (s, 1H), 8.99 – 8.76 (m, 1H), 8.31 – 8.11 (m, 1H), 8.02 (d, J = 8.5 Hz, 1H), 7.39 (br s, 1H, NH, D ₂ O exchanged), 6.41 (s, 1H), 4.14 – 3.91 (m, 1H), 3.65 – 3.53 (m, 1H), 3.35 (s, 3H), 2.34 – 2.04 (m, 1H), 1.93 – 1.81 (m, 1H), 1.76 – 1.35 (m, 6H). MS (ESI ⁺): [M+H] ⁺ 357.2. Prep. chiral SFC from 169 : Lux A2 (21.2 mm x 250 mm, 5 μ m), (40 °C, 50 mL/min, 218 nm, inj. vol.: 500 μ L (10 mg); isocratic conditions: 25/75 (MeOH/CO ₂). Anal. chiral SFC: same conditions as 169 . t_R (169A): 5.04 min, ee = >99%.

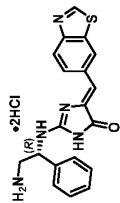
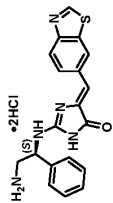
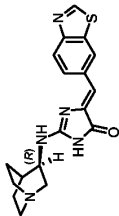
Cpd N°	Structure	Formula	MW	HPLC	Description
169B		$C_{18}H_{20}N_4O_2S$	356.44	>98%	Yellow solid. 1H NMR (400 MHz, DMSO- d_6 , 323K) of major tautomer δ_H 10.40 (br s, 1H, NH, D ₂ O exchanged), 9.33 (s, 1H), 8.99 – 8.76 (m, 1H), 8.31 – 8.11 (m, 1H), 8.02 (d, J = 8.5 Hz, 1H), 7.39 (br s, 1H, NH, D ₂ O exchanged), 6.41 (s, 1H), 4.14 – 3.91 (m, 1H), 3.65 – 3.53 (m, 1H), 3.35 (s, 3H), 2.34 – 2.04 (m, 1H), 1.93 – 1.81 (m, 1H), 1.76 – 1.35 (m, 6H). MS (ESI ⁺) : [M+H] ⁺ 357.2. Prep. chiral SFC from 169 : Lux A2 (21.2 mm x 250 mm, 5 μ m), (40 °C, 50 mL/min, 218 nm, inj. vol.: 500 μ L (10 mg); isocratic conditions: 25/75 (MeOH/CO ₂). Anal. chiral SFC: same conditions as 169 . t_R (169B): 6.25 min, ee = >98%.
170		$C_{18}H_{20}N_4O_2S$	356.44	>98%	Yellow solid. 1H NMR (400 MHz, DMSO- d_6 , 323K) of major tautomer δ_H 10.37 (br s, 1H, NH, D ₂ O exchanged), 9.33 (s, 1H), 8.97 – 8.59 (m, 1H), 8.36 – 8.08 (m, 1H), 8.02 (d, J = 8.4 Hz, 1H), 7.56 (br s, 1H, NH, D ₂ O exchanged), 6.40 (s, 1H), 4.46 – 4.23 (m, 1H, OH, D ₂ O exchanged), 4.09 – 3.83 (m, 1H), 3.83 – 3.69 (m, 1H), 2.01 – 1.53 (m, 8H), 1.53 – 1.39 (m, 1H), 1.38 – 1.21 (m, 1H). MS (ESI ⁺) : [M+H] ⁺ 357.2.

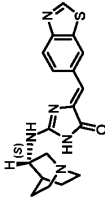
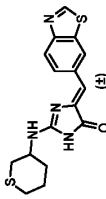
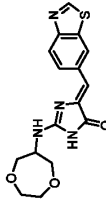
Cpd N°	Structure	Formula	MW	HPLC	Description
171		$C_{18}H_{20}N_4O_2S$	356.44	>98%	Yellow solid. 1H NMR (400 MHz, DMSO- d_6 , 373K) of major tautomer δ_H 10.36 (br s, 1H, NH, D ₂ O exchanged), 9.31 (s, 1H), 8.85 (s, 1H), 8.20 (d, J = 8.6 Hz, 1H), 8.01 (d, J = 8.6 Hz, 1H), 7.35 (br s, 1H, NH, D ₂ O exchanged), 6.40 (s, 1H), 4.23 (d, J = 4.2 Hz, 1H, OH, D ₂ O exchanged), 4.04 – 3.82 (m, 1H), 3.79 – 3.64 (m, 1H), 2.05 – 1.72 (m, 4H), 1.69 – 1.39 (m, 6H). MS (ESI ⁺) : [M+H] ⁺ 357.2. Anal. chiral SFC: Chiralpak IG (4.6 mm x 250 mm, 5 μ m), (40 °C, 4 mL/min, 210–400 nm, inj. vol.: 1 μ L; isocratic conditions: 1/1 (MeOH/CO ₂ (0.2% v/v NH ₃)), t_R (171A): 1.79 min, t_R (171B): 2.34 min.
171A		$C_{18}H_{20}N_4O_2S$	356.44	>98%	Yellow solid. 1H NMR (400 MHz, DMSO- d_6 , 373K) of major tautomer δ_H 10.36 (br s, 1H, NH, D ₂ O exchanged), 9.31 (s, 1H), 8.85 (s, 1H), 8.20 (d, J = 8.6 Hz, 1H), 8.01 (d, J = 8.6 Hz, 1H), 7.35 (br s, 1H, NH, D ₂ O exchanged), 6.40 (s, 1H), 4.23 (d, J = 4.2 Hz, 1H, OH, D ₂ O exchanged), 4.04 – 3.82 (m, 1H), 3.79 – 3.64 (m, 1H), 2.05 – 1.72 (m, 4H), 1.69 – 1.39 (m, 6H). MS (ESI ⁺) : [M+H] ⁺ 357.2. MS (ESI ⁺) : [M+H] ⁺ 357.2. Prep. chiral SFC from 171 : Chiralpak IG (20 mm x 250 mm, 5 μ m), (40 °C, 50 mL/min, 218 nm, inj. vol.: 500 μ L (8 mg); isocratic conditions: 4/6 (MeOH/CO ₂). Anal. chiral SFC: same conditions as 171 . t_R (171A): 1.80 min, ee = >99%.

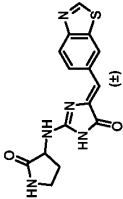
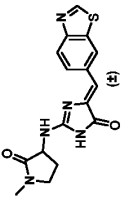
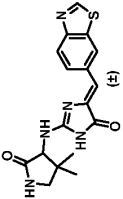
Cpd N°	Structure	Formula	MW	HPLC	Description
171B		$C_{18}H_{20}N_4O_2S$	356.44	>98%	Yellow solid. 1H NMR (400 MHz, DMSO- d_6 , 373K) of major tautomer δ_H 10.36 (br s, 1H, NH, D ₂ O exchanged), 9.31 (s, 1H), 8.85 (s, 1H), 8.20 (d, J = 8.6 Hz, 1H), 8.01 (d, J = 8.6 Hz, 1H), 7.35 (br s, 1H, NH, D ₂ O exchanged), 6.40 (s, 1H), 4.23 (d, J = 4.2 Hz, 1H, OH, D ₂ O exchanged), 4.04 – 3.82 (m, 1H), 3.79 – 3.64 (m, 1H), 2.05 – 1.72 (m, 4H), 1.69 – 1.39 (m, 6H). MS (ESI ⁺) : [M+H] ⁺ 357.2. MS (ESI ⁺) : [M+H] ⁺ 357.2. Prep. chiral SFC from 171 : Chiralpak IG (20 mm x 250 mm, 5 μ m), (40 °C, 50 mL/min, 218 nm, inj. vol.: 500 μ L (8 mg); isocratic conditions: 4/6 (MeOH/CO ₂). Anal. chiral SFC: same conditions as 171 . t_R (171B): 2.36 min, ee = >97.8%.
172		$C_{19}H_{22}N_4O_2S$	370.47	>98%	Yellow solid. 1H NMR (400 MHz, DMSO- d_6 , 323K) of major tautomer δ_H 10.50 (br s, 1H, NH, D ₂ O exchanged), 9.33 (s, 1H), 8.90 (s, 1H), 8.27 – 8.13 (m, 1H), 8.02 (d, J = 8.5 Hz, 1H), 7.45 (br s, 1H, NH, D ₂ O exchanged), 6.42 (s, 1H), 4.14 – 3.78 (m, 1H), 3.55 – 3.36 (m, 1H), 3.26 (s, 3H), 2.39 – 2.14 (m, 1H), 2.04 – 1.80 (m, 2H), 1.81 – 1.38 (m, 7H). MS (ESI ⁺) : [M+H] ⁺ 371.1.
173		$C_{19}H_{22}N_4O_2S$	370.47	98%	Yellow solid. 1H NMR (400 MHz, DMSO- d_6 , 323K) of major tautomer δ_H 10.44 (br s, 1H, NH, D ₂ O exchanged), 9.32 (s, 1H), 8.90 (s, 1H), 8.19 (d, J = 8.7 Hz, 1H), 8.01 (d, J = 8.5 Hz, 1H), 7.48 (br s, 1H, NH, D ₂ O exchanged), 6.41 (s, 1H), 4.21 – 3.96 (m, 1H), 3.57 – 3.45 (m, 1H), 3.28 (s, 3H), 2.23 – 2.06 (m, 1H), 2.05 – 1.78 (m, 3H), 1.78 – 1.33 (m, 6H). MS (ESI ⁺) : [M+H] ⁺ 371.2.

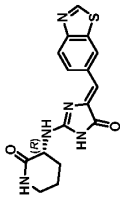
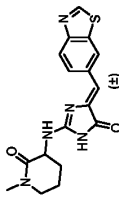
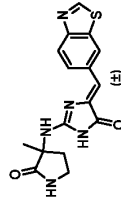
Cpd N°	Structure	Formula	MW	HPLC	Description
174		C ₁₉ H ₂₂ N ₄ O ₂ S	370.47	>98%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 323K) of major tautomer δ _H 10.46 (br s, 1H, NH, D ₂ O exchanged), 9.33 (s, 1H), 8.92 – 8.75 (m, 1H), 8.28 – 8.16 (m, 1H), 8.02 (d, <i>J</i> = 8.4 Hz, 1H), 7.51 (br s, 1H, NH, D ₂ O exchanged), 6.40 (s, 1H), 4.08 – 3.79 (m, 1H), 3.45 – 3.34 (m, 1H), 3.23 (s, 3H), 2.01 – 1.48 (m, 9H), 1.42 – 1.29 (m, 1H). MS (ESI ⁺) : [M+H] ⁺ 371.2.
175		C ₁₉ H ₂₂ N ₄ O ₂ S	370.47	>98%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 323K) of major tautomer δ _H 10.46 (br s, 1H, NH, D ₂ O exchanged), 9.33 (s, 1H), 9.03 – 8.63 (m, 1H), 8.31 – 8.09 (m, 1H), 8.02 (d, <i>J</i> = 8.4 Hz, 1H), 7.51 (br s, 1H, NH, D ₂ O exchanged), 6.40 (s, 1H), 4.09 – 3.81 (m, 1H), 3.43 – 3.31 (m, 1H), 3.24 (s, 3H), 2.08 – 1.88 (m, 3H), 1.86 – 1.74 (m, 1H), 1.73 – 1.44 (m, 6H). MS (ESI ⁺) : [M+H] ⁺ 371.2.
176		C ₂₀ H ₁₈ N ₄ O ₂ S	378.45	>98%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 323K) of major tautomer δ _H 10.55 (br s, 1H, NH, D ₂ O exchanged), 9.34 (s, 1H), 8.82 (s, 1H), 8.29 – 7.92 (m, 2H + NH, D ₂ O exchanged), 7.48 (d, <i>J</i> = 7.6 Hz, 2H), 7.38 (t, <i>J</i> = 7.5 Hz, 2H), 7.28 (t, <i>J</i> = 7.3 Hz, 1H), 6.42 (s, 1H), 5.35 – 5.11 (m, 1H), 3.88 – 3.58 (m, 2H), 3.34 (s, 3H). MS (ESI ⁺) : [M+H] ⁺ 379.2.

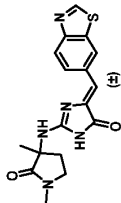
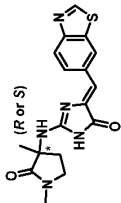
Cpd N°	Structure	Formula	MW	HPLC	Description
177		C ₂₀ H ₁₈ N ₄ O ₂ S	378.45	>98%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 323K) of major tautomer δ _H 10.55 (br s, 1H, NH, D ₂ O exchanged), 9.34 (s, 1H), 8.82 (s, 1H), 8.29 – 7.92 (m, 2H + NH, D ₂ O exchanged), 7.48 (d, <i>J</i> = 7.6 Hz, 2H), 7.38 (t, <i>J</i> = 7.5 Hz, 2H), 7.28 (t, <i>J</i> = 7.3 Hz, 1H), 6.42 (s, 1H), 5.35 – 5.11 (m, 1H), 3.88 – 3.58 (m, 2H), 3.34 (s, 3H). MS (ESI ⁺): [M+H] ⁺ 379.2.
178		C ₁₉ H ₁₆ N ₄ O ₂ S	364.42	>98%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 300K) of major tautomer δ _H 10.57 (br s, 1H, NH, D ₂ O exchanged), 9.37 (s, 1H), 9.05 – 8.80 (m, 1H), 8.30 – 8.13 (m, 1H), 8.05 (d, <i>J</i> = 8.5 Hz, 1H), 7.57 (br s, 1H, NH, D ₂ O exchanged), 7.53 – 7.23 (m, 5H), 6.44 (s, 1H), 5.69 (br s, 1H, OH, D ₂ O exchanged), 5.19 – 4.67 (m, 1H), 3.85 – 3.50 (m, 1H), 3.48 – 3.33 (m, 1H). MS (ESI ⁺): [M+H] ⁺ 365.1.
179		C ₁₉ H ₁₆ N ₄ O ₂ S	364.42	>98%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 300K) of major tautomer δ _H 10.57 (br s, 1H, NH, D ₂ O exchanged), 9.37 (s, 1H), 9.05 – 8.80 (m, 1H), 8.30 – 8.13 (m, 1H), 8.05 (d, <i>J</i> = 8.5 Hz, 1H), 7.57 (br s, 1H, NH, D ₂ O exchanged), 7.53 – 7.23 (m, 5H), 6.44 (s, 1H), 5.69 (br s, 1H, OH, D ₂ O exchanged), 5.19 – 4.67 (m, 1H), 3.85 – 3.50 (m, 1H), 3.48 – 3.33 (m, 1H). MS (ESI ⁺): [M+H] ⁺ 365.1.

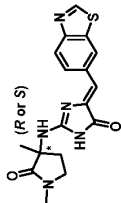
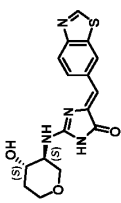
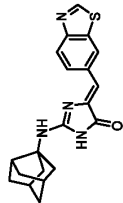
Cpd N°	Structure	Formula	MW	HPLC	Description
180		C ₁₉ H ₁₉ Cl ₂ N ₅ OS	436.36	98%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 323K) of major tautomer δ _H 9.38 (s, 1H), 8.88 – 8.73 (m, 1H), 8.28 (br s, 3H, NH, D ₂ O exchanged), 8.14 – 8.02 (m, 2H), 7.53 (d, <i>J</i> = 7.3 Hz, 2H), 7.44 (t, <i>J</i> = 7.6 Hz, 2H), 7.35 (t, <i>J</i> = 7.3 Hz, 1H), 6.55 (s, 1H), 5.53 – 5.35 (m, 1H), 4.45 (br s, 3H, NH, D ₂ O exchanged), 3.50 – 3.37 (m, 1H), 3.34 – 3.22 (m, 1H). MS (ESI ⁺) : [M+H] ⁺ 364.1 (+2HCl).
181		C ₁₉ H ₁₉ Cl ₂ N ₅ OS	436.36	97%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 323K) of major tautomer δ _H 9.38 (s, 1H), 8.88 – 8.73 (m, 1H), 8.28 (br s, 3H, NH, D ₂ O exchanged), 8.14 – 8.02 (m, 2H), 7.53 (d, <i>J</i> = 7.3 Hz, 2H), 7.44 (t, <i>J</i> = 7.6 Hz, 2H), 7.35 (t, <i>J</i> = 7.3 Hz, 1H), 6.55 (s, 1H), 5.53 – 5.35 (m, 1H), 4.45 (br s, 3H, NH, D ₂ O exchanged), 3.50 – 3.37 (m, 1H), 3.34 – 3.22 (m, 1H). MS (ESI ⁺) : [M+H] ⁺ 364.1 (+2HCl).
182		C ₁₈ H ₁₉ N ₅ OS	353.44	97%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 373K) of major tautomer δ _H 10.52 (br s, 1H, NH, D ₂ O exchanged), 9.31 (s, 1H), 8.88 – 8.66 (m, 1H), 8.33 – 8.09 (m, 1H), 8.03 (d, <i>J</i> = 8.4 Hz, 1H), 7.89 (br s, 1H, NH, D ₂ O exchanged), 6.47 (s, 1H), 4.21 – 4.05 (m, 1H), 3.61 – 3.43 (m, 1H), 3.18 – 2.81 (m, 5H), 2.23 – 2.08 (m, 1H), 2.01 – 1.72 (m, 3H), 1.67 – 1.53 (s, 1H). MS (ESI ⁺) : [M+H] ⁺ 354.2.

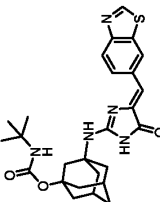
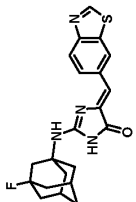
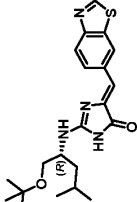
Cpd N°	Structure	Formula	MW	HPLC	Description
183		C ₁₈ H ₁₉ N ₅ O ₃ S	353.44	>98%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 373K) of major tautomer δ _H 10.52 (br s, 1H, NH, D ₂ O exchanged), 9.31 (s, 1H), 8.88 – 8.66 (m, 1H), 8.33 – 8.09 (m, 1H), 8.03 (d, <i>J</i> = 8.4 Hz, 1H), 7.89 (br s, 1H, NH, D ₂ O exchanged), 6.47 (s, 1H), 4.21 – 4.05 (m, 1H), 3.61 – 3.43 (m, 1H), 3.18 – 2.81 (m, 5H), 2.23 – 2.08 (m, 1H), 2.01 – 1.72 (m, 3H), 1.67 – 1.53 (s, 1H). MS (ESI ⁺) : [M+H] ⁺ 354.2.
184		C ₁₆ H ₁₆ N ₄ O ₃ S ₂	344.45	>98%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 373K) of major tautomer δ _H 10.20 (br s, 1H, NH, D ₂ O exchanged), 9.29 (s, 1H), 8.95 – 8.61 (m, 1H), 8.36 – 8.08 (m, 1H), 8.03 (d, <i>J</i> = 8.2 Hz, 1H), 7.24 (br s, 1H, NH, D ₂ O exchanged), 6.46 (s, 1H), 4.16 – 3.99 (m, 1H), 2.95 – 2.88 (m, 1H), 2.66 (dd, <i>J</i> = 13.0, 8.9 Hz, 1H), 2.60 – 2.52 (m, 2H), 2.16 – 1.89 (m, 2H), 1.88 – 1.75 (m, 1H), 1.69 – 1.57 (m, 1H). MS (ESI ⁺) : [M+H] ⁺ 345.1.
185		C ₁₆ H ₁₆ N ₄ O ₃ S	344.39	>98%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 343K) of major tautomer δ _H 10.41 (br s, 1H, NH, D ₂ O exchanged), 9.32 (s, 1H), 8.97 – 8.65 (m, 1H), 8.39 – 8.11 (m, 1H), 8.04 (d, <i>J</i> = 8.4 Hz, 1H), 7.36 (br s, 1H, NH, D ₂ O exchanged), 6.45 (s, 1H), 3.92 – 3.71 (m, 3H), 3.71 – 3.57 (m, 2H), 3.56 – 3.29 (m, 4H). MS (ESI ⁺) : [M+H] ⁺ 345.2.

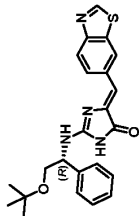
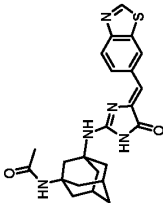
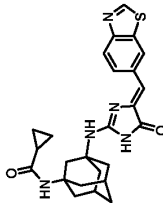
Cpd N°	Structure	Formula	MW	HPLC	Description
186		<chem>C15H13N5O2S</chem>	327.36	>98%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 323K) of major tautomer δ _H 10.65 (br s, 1H, NH, D ₂ O exchanged), 9.34 (s, 1H), 8.90 – 8.70 (m, 1H), 8.34 – 8.16 (m, 1H), 8.03 (d, <i>J</i> = 8.5 Hz, 1H), 7.90 (br s, 1H, NH, D ₂ O exchanged), 7.71 (br s, 1H, NH, D ₂ O exchanged), 6.46 (s, 1H), 4.58 – 4.40 (m, 1H), 3.39 – 3.23 (m, 2H), 2.59 – 2.51 (m, 1H), 2.20 – 2.04 (m, 1H). MS (ESI ⁺) : [M+H] ⁺ 328.1.
187		<chem>C16H15N5O2S</chem>	341.39	>98%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 323K) of major tautomer δ _H 10.72 (br s, 1H, NH, D ₂ O exchanged), 9.34 (s, 1H), 8.79 (s, 1H), 8.22 (d, <i>J</i> = 8.6 Hz, 1H), 8.03 (d, <i>J</i> = 8.6 Hz, 1H), 7.77 (br s, 1H, NH, D ₂ O exchanged), 6.46 (s, 1H), 4.66 – 4.43 (m, 1H), 3.48 – 3.32 (m, 2H), 3.20 (s, 3H), 2.49 – 2.42 (m, 1H), 2.19 – 2.01 (m, 1H). MS (ESI ⁺) : [M+H] ⁺ 342.2.
188		<chem>C17H17N5O2S</chem>	355.42	>98%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 323K) of major tautomer δ _H 10.51 (br s, 1H, NH, D ₂ O exchanged), 9.34 (s, 1H), 9.00 – 8.66 (m, 1H), 8.32 – 8.10 (m, 1H), 8.02 (d, <i>J</i> = 8.4 Hz, 1H), 7.87 (br s, 1H, NH, D ₂ O exchanged), 7.65 (br s, 1H, NH, D ₂ O exchanged), 6.47 (s, 1H), 4.62 – 4.37 (m, 1H), 3.19 – 3.13 (m, 1H), 3.00 (d, <i>J</i> = 9.7 Hz, 1H), 1.30 (s, 3H), 0.99 (s, 3H). MS (ESI ⁺) : [M+H] ⁺ 356.1.

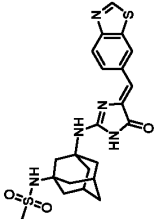
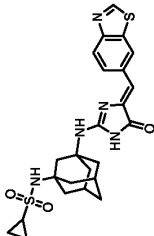
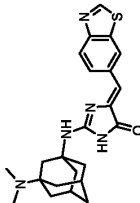
Cpd N°	Structure	Formula	MW	HPLC	Description
189		$C_{16}H_{15}N_5O_2S$	341.39	>98%	Yellow solid. 1H NMR (400 MHz, DMSO- d_6 , 300K) of major tautomer δ_H 10.75 (br s, 1H, NH, D ₂ O exchanged), 9.36 (s, 1H), 8.84 (s, 1H), 8.23 (d, J = 8.6 Hz, 1H), 8.03 (d, J = 8.5 Hz, 1H), 7.78 (br s, 2H, NH, D ₂ O exchanged), 6.43 (s, 1H), 4.49 – 4.16 (m, 1H), 3.28 – 3.12 (m, 2H), 2.30 – 2.09 (m, 1H), 1.88 (s, 3H). MS (ESI ⁺) : [M+H] ⁺ 342.1.
190		$C_{17}H_{17}N_5O_2S$	355.42	>98%	Yellow solid. 1H NMR (400 MHz, DMSO- d_6 , 323K) of major tautomer δ_H 10.65 (br s, 1H, NH, D ₂ O exchanged), 9.34 (s, 1H), 8.91 – 8.70 (m, 1H), 8.34 – 8.12 (m, 1H), 8.03 (d, J = 8.5 Hz, 1H), 7.67 (br s, 1H, NH, D ₂ O exchanged), 6.45 (s, 1H), 4.41 – 4.22 (m, 1H), 3.46 – 3.27 (m, 2H), 2.89 (s, 3H), 2.35 – 2.17 (m, 1H), 2.10 – 1.86 (m, 3H). MS (ESI ⁺) : [M+H] ⁺ 356.1.
191		$C_{16}H_{15}N_5O_2S$	341.39	>98%	Yellow solid. 1H NMR (400 MHz, DMSO- d_6 , 323K) of major tautomer δ_H 10.10 (br s, 1H, NH, D ₂ O exchanged), 9.35 (s, 1H), 8.80 (s, 1H), 8.26 (d, J = 8.7 Hz, 1H), 8.05 (d, J = 8.6 Hz, 1H), 7.94 (br s, 1H, NH, D ₂ O exchanged), 7.33 (br s, 1H, NH, D ₂ O exchanged), 6.48 (s, 1H), 3.46 – 3.25 (m, 2H), 2.85 – 2.70 (m, 1H), 2.30 (dd, J = 12.8 and 7.2 Hz, 1H), 1.46 (s, 3H). MS (ESI ⁺) : [M+H] ⁺ 342.1.

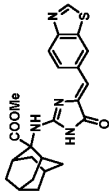
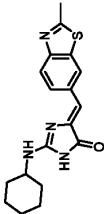
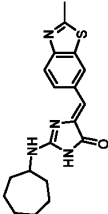
Cpd N°	Structure	Formula	MW	HPLC	Description
192		$C_{17}H_{17}N_5O_2S$	355.42	>98%	Yellow solid. 1H NMR (400 MHz, DMSO- d_6 , 300K) of major tautomer δ_H 10.33 (br s, 1H, NH, D $_2$ O exchanged), 9.37 (s, 1H), 8.75 (s, 1H), 8.18 (dd, J = 8.6, 1.6 Hz, 1H), 8.04 (d, J = 8.6 Hz, 1H), 7.70 (br s, 1H, NH, D $_2$ O exchanged), 6.46 (s, 1H), 3.56 – 3.41 (m, 2H), 2.89 (s, 3H), 2.83 – 2.71 (m, 1H), 2.18 – 2.06 (m, 1H), 1.40 (s, 3H). MS (ESI $^+$): [M+H] $^+$ 356.2. Anal. chiral SFC: Amy-C (4.6 mm x 250 mm, 5 μ m), (40 $^\circ$ C, 4 mL/min, 210-400 nm, inj. vol.: 1 μ L; isocratic conditions: 4/6 (MeOH/CO $_2$ 0.2% v/v NH $_3$)), t_R (192A): 1.95 min, t_R (192B): 2.53 min.
192A		$C_{17}H_{17}N_5O_2S$	355.42	>98%	Yellow solid. 1H NMR (400 MHz, DMSO- d_6 , 300K) of major tautomer δ_H 10.33 (br s, 1H, NH, D $_2$ O exchanged), 9.37 (s, 1H), 8.75 (s, 1H), 8.18 (dd, J = 8.6, 1.6 Hz, 1H), 8.04 (d, J = 8.6 Hz, 1H), 7.70 (br s, 1H, NH, D $_2$ O exchanged), 6.46 (s, 1H), 3.56 – 3.41 (m, 2H), 2.89 (s, 3H), 2.83 – 2.71 (m, 1H), 2.18 – 2.06 (m, 1H), 1.40 (s, 3H). MS (ESI $^+$): [M+H] $^+$ 356.1. ee = >99%. Prep. chiral SFC from 192 : Lux A1 (21.2 mm x 250 mm, 5 μ m), (40 $^\circ$ C, 50 mL/min, 210 nm, inj. vol.: 1000 μ L (19 mg); isocratic conditions: 4/6 (MeOH/CO $_2$). Anal. chiral SFC: same conditions as 192 . t_R (192A): 1.96 min, ee = >99%.

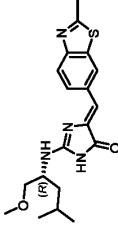
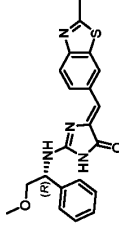
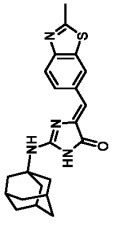
Cpd N°	Structure	Formula	MW	HPLC	Description
192B		$C_{17}H_{17}N_5O_2S$	355.42	>98%	Yellow solid. 1H NMR (400 MHz, DMSO- d_6 , 300K) of major tautomer δ_H 10.33 (br s, 1H, NH, D ₂ O exchanged), 9.37 (s, 1H), 8.75 (s, 1H), 8.18 (dd, J = 8.6, 1.6 Hz, 1H), 8.04 (d, J = 8.6 Hz, 1H), 7.70 (br s, 1H, NH, D ₂ O exchanged), 6.46 (s, 1H), 3.56 – 3.41 (m, 2H), 2.89 (s, 3H), 2.83 – 2.71 (m, 1H), 2.18 – 2.06 (m, 1H), 1.40 (s, 3H). MS (ESI ⁺) : [M+H] ⁺ 356.1. ee = >99%. Prep. chiral SFC from 192 : Lux A1 (21.2 mm x 250 mm, 5 μ m), (40 °C, 50 mL/min, 210 nm, inj. vol.: 1000 μ L (19 mg); isocratic conditions: 4/6 (MeOH/CO ₂). Anal. chiral SFC: same conditions as 192 . t_R (192B): 2.51 min, ee = >99%.
193		$C_{16}H_{16}N_4O_3S$	344.39	>98%	Yellow solid. 1H NMR (400 MHz, DMSO- d_6 , 343K) of major tautomer δ_H 10.12 (br s, 1H, NH, D ₂ O exchanged), 9.32 (s, 1H), 8.89 – 8.54 (m, 1H), 8.34 – 8.08 (m, 1H), 8.04 (d, J = 8.4 Hz, 1H), 7.36 (br s, 1H, NH, D ₂ O exchanged), 6.45 (s, 1H), 4.96 (br s, 1H, OH, D ₂ O exchanged), 4.01 (d, J = 11.2 Hz, 1H), 3.93 – 3.79 (m, 1H), 3.78 – 3.58 (m, 2H), 3.41 (t, J = 10.7 Hz, 1H), 3.33 – 3.20 (m, 1H), 1.94 (d, J = 13.3 Hz, 1H), 1.63 – 1.47 (m, 1H). MS (ESI ⁺) : [M+H] ⁺ 345.2.
194		$C_{20}H_{20}N_4O_3S$	364.47	>98%	Yellow solid. 1H NMR (400 MHz, DMSO- d_6 , 343K) of major tautomer δ_H 9.95 (br s, 1H, NH, D ₂ O exchanged), 9.30 (s, 1H), 8.99 (s, 1H), 8.12 (dd, J = 8.6, 1.6 Hz, 1H), 7.99 (d, J = 8.5 Hz, 1H), 7.29 (br s, 1H, NH, D ₂ O exchanged), 6.43 (s, 1H), 2.72 (t, J = 6.7 Hz, 1H), 2.37 – 2.26 (m, 4H), 2.22 – 2.12 (m, 2H), 2.03 – 1.94 (m, 2H), 1.74 – 1.53 (m, 4H). MS (ESI ⁺) : [M+H] ⁺ 365.2.

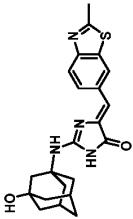
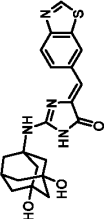
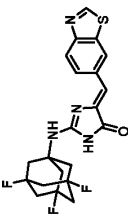
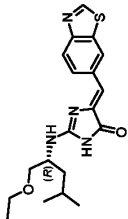
Cpd N°	Structure	Formula	MW	HPLC	Description
195		<chem>C26H31N5O3S</chem>	493.63	92% (NMR)	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 343K) of major tautomer δ _H 9.81 (br s, 1H, NH, D ₂ O exchanged), 9.31 (s, 1H), 8.95 (s, 1H), 8.17 (d, <i>J</i> = 8.6 Hz, 1H), 8.03 (d, <i>J</i> = 8.5 Hz, 1H), 6.98 (br s, 1H, NH, D ₂ O exchanged), 6.44 (s, 1H), 6.20 (br s, 1H, NH, D ₂ O exchanged), 2.60 (s, 1H), 2.40 – 1.93 (m, 9H), 1.68 – 1.39 (m, 4H), 1.31 – 1.09 (m, 9H). MS (ESI ⁺) : [M+H] ⁺ 494.3.
196		<chem>C21H21FN4OS</chem>	396.48	98%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 343K) of major tautomer δ _H 9.89 (br s, 1H, NH, D ₂ O exchanged), 9.31 (s, 1H), 8.97 (s, 1H), 8.13 (d, <i>J</i> = 8.6 Hz, 1H), 8.02 (d, <i>J</i> = 8.5 Hz, 1H), 7.04 (br s, 1H, NH, D ₂ O exchanged), 6.46 (s, 1H), 2.44 – 2.25 (m, 4H), 2.23 – 1.98 (m, 4H), 1.96 – 1.83 (m, 4H), 1.67 – 1.53 (m, 2H). MS (ESI ⁺) : [M+H] ⁺ 397.2.
197		<chem>C21H28N4O2S</chem>	400.54	95%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 343K) of major tautomer δ _H 10.31 (br s, 1H, NH, D ₂ O exchanged), 9.30 (s, 1H), 8.92 (s, 1H), 8.16 (d, <i>J</i> = 8.5 Hz, 1H), 7.99 (d, <i>J</i> = 8.5 Hz, 1H), 7.02 (br s, 1H, NH, D ₂ O exchanged), 6.42 (s, 1H), 4.21 – 3.92 (m, 1H), 3.60 – 3.32 (m, 2H), 1.81 – 1.62 (m, 1H), 1.61 – 1.40 (m, 2H), 1.18 (s, 9H), 0.97 (t, <i>J</i> = 7.4 Hz, 6H). MS (ESI ⁺) : [M+H] ⁺ 401.3.

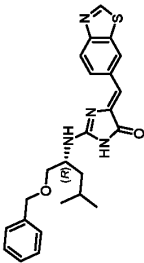
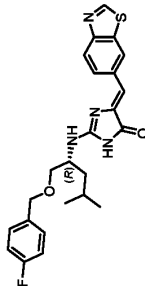
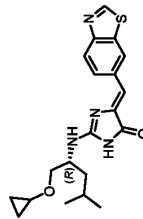
Cpd N ^o	Structure	Formula	MW	HPLC	Description
198		C ₂₃ H ₂₄ N ₄ O ₂ S	420.53	>98%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 343K) of major tautomer δ _H 10.39 (br s, 1H, NH, D ₂ O exchanged), 9.32 (s, 1H), 8.82 (s, 1H), 8.13 (d, <i>J</i> = 8.6 Hz, 1H), 8.00 (d, <i>J</i> = 8.5 Hz, 1H), 7.66 (br s, 1H, NH, D ₂ O exchanged), 7.55 – 7.19 (m, 5H), 6.42 (s, 1H), 5.16 – 4.96 (m, 1H), 3.81 – 3.58 (m, 2H), 1.16 (s, 9H). MS (ESI ⁺) : [M+H] ⁺ 421.3.
199		C ₂₃ H ₂₅ N ₅ O ₂ S	435.55	>98%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 323K) of major tautomer δ _H 9.87 (br s, 1H, NH, D ₂ O exchanged), 9.32 (s, 1H), 9.00 (s, 1H), 8.15 (d, <i>J</i> = 8.7 Hz, 1H), 8.03 (d, <i>J</i> = 8.5 Hz, 1H), 7.36 (br s, 1H, NH, D ₂ O exchanged), 6.99 (br s, 1H, NH, D ₂ O exchanged), 6.43 (s, 1H), 2.49 – 2.43 (m, 2H), 2.35 – 2.11 (m, 4H), 2.10 – 1.85 (m, 6H), 1.76 (s, 3H), 1.68 – 1.55 (m, 2H). MS (ESI ⁺) : [M+H] ⁺ 436.2.
200		C ₂₅ H ₂₇ N ₅ O ₂ S	461.58	>98%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 323K) of major tautomer δ _H 9.87 (br s, 1H, NH, D ₂ O exchanged), 9.32 (s, 1H), 8.99 (s, 1H), 8.15 (d, <i>J</i> = 8.6 Hz, 1H), 8.03 (d, <i>J</i> = 8.6 Hz, 1H), 7.58 (br s, 1H, NH, D ₂ O exchanged), 7.01 (br s, 1H, NH, D ₂ O exchanged), 6.43 (s, 1H), 2.49 – 2.44 (m, 2H), 2.38 – 2.11 (m, 4H), 2.11 – 1.84 (m, 6H), 1.70 – 1.51 (m, 3H), 0.75 – 0.44 (m, 4H). MS (ESI ⁺) : [M+H] ⁺ 462.2.

Cpd N°	Structure	Formula	MW	HPLC	Description
201		$C_{22}H_{25}N_5O_3S_2$	471.59	>98%	Yellow solid. 1H NMR (400 MHz, DMSO- d_6 , 323K) of major tautomer δ_H 9.90 (br s, 1H, NH, D $_2$ O exchanged), 9.32 (s, 1H), 8.94 (s, 1H), 8.17 (d, J = 8.6 Hz, 1H), 8.02 (d, J = 8.5 Hz, 1H), 7.04 (br s, 1H, NH, D $_2$ O exchanged), 6.93 (br s, 1H, NH, D $_2$ O exchanged), 6.43 (s, 1H), 2.97 (s, 3H), 2.43 (s, 2H), 2.29 – 1.84 (m, 10H), 1.68 – 1.54 (m, 2H). MS (ESI $^+$) : [M+H] $^+$ 472.1.
202		$C_{24}H_{27}N_5O_3S_2$	497.63	>98%	Yellow solid. 1H NMR (400 MHz, DMSO- d_6 , 323K) of major tautomer δ_H 9.89 (br s, 1H, NH, D $_2$ O exchanged), 9.32 (s, 1H), 8.93 (s, 1H), 8.18 (d, J = 8.6 Hz, 1H), 8.02 (d, J = 8.6 Hz, 1H), 7.03 (br s, 1H, NH, D $_2$ O exchanged), 6.91 (br s, 1H, NH, D $_2$ O exchanged), 6.44 (s, 1H), 2.58 – 2.51 (m, 1H), 2.43 (s, 2H), 2.30 – 1.87 (m, 10H), 1.69 – 1.48 (m, 2H), 0.99 – 0.85 (m, 4H). MS (ESI $^+$) : [M+H] $^+$ 498.1.
203		$C_{23}H_{27}N_5OS$	421.56	97%	Yellow solid. 1H NMR (400 MHz, DMSO- d_6 , 373K) of major tautomer δ_H 9.61 (br s, 1H, NH, D $_2$ O exchanged), 9.28 (s, 1H), 9.10 – 8.85 (m, 1H), 8.26 – 8.06 (m, 1H), 8.00 (d, J = 7.9 Hz, 1H), 6.71 (br s, 1H, NH, D $_2$ O exchanged), 6.44 (s, 1H), 2.27 (s, 6H), 2.26 – 1.93 (m, 8H), 1.79 – 1.53 (m, 6H). MS (ESI $^+$) : [M+H] $^+$ 422.1.

Cpd N°	Structure	Formula	MW	HPLC	Description
204		<chem>C23H24N4O3S</chem>	436.53	85% (NMR)	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 323K) of major tautomer δ _H 9.91 (br s, 1H, NH, D ₂ O exchanged), 9.34 (s, 1H), 8.95 (s, 1H), 8.05 (d, <i>J</i> = 8.8 Hz, 1H), 8.00 (d, <i>J</i> = 8.5 Hz, 1H), 7.46 (br s, 1H, NH, D ₂ O exchanged), 6.46 (s, 1H), 3.63 (s, 3H), 2.70 – 2.58 (m, 2H), 2.19 – 2.00 (m, 4H), 1.91 – 1.58 (m, 8H). MS (ESI ⁺) : [M+H] ⁺ 437.0.
205		<chem>C18H20N4OS</chem>	340.45	>98%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 343K) of major tautomer δ _H 10.14 (br s, 1H, NH, D ₂ O exchanged), 8.78 – 8.51 (m, 1H), 8.20 – 7.95 (m, 1H), 7.84 (d, <i>J</i> = 8.5 Hz, 1H), 7.33 (br s, 1H, NH, D ₂ O exchanged), 6.37 (s, 1H), 3.79 – 3.66 (m, 1H), 2.79 (s, 3H), 2.01 – 1.87 (m, 2H), 1.80 – 1.69 (m, 2H), 1.65 – 1.56 (m, 1H), 1.43 – 1.15 (m, 5H). MS (ESI ⁺) : [M+H] ⁺ 341.2.
206		<chem>C19H22N4OS</chem>	354.47	>98%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 343K) of major tautomer δ _H 10.29 (br s, 1H, NH, D ₂ O exchanged), 8.93 – 8.59 (m, 1H), 8.26 – 7.98 (m, 1H), 7.84 (d, <i>J</i> = 8.4 Hz, 1H), 7.31 (br s, 1H, NH, D ₂ O exchanged), 6.38 (s, 1H), 4.03 – 3.83 (m, 1H), 2.79 (s, 3H), 2.06 – 1.88 (m, 2H), 1.81 – 1.40 (m, 10H). MS (ESI ⁺) : [M+H] ⁺ 355.2.

Cpd N°	Structure	Formula	MW	HPLC	Description
207		C ₁₉ H ₂₄ N ₄ O ₂ S	372.49	>98%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 343K) of major tautomer δ _H 10.29 (br s, 1H, NH, D ₂ O exchanged), 8.92 – 8.59 (m, 1H), 8.18 – 7.95 (m, 1H), 7.83 (d, <i>J</i> = 8.4 Hz, 1H), 7.18 (br s, 1H, NH, D ₂ O exchanged), 6.39 (s, 1H), 4.27 – 4.05 (m, 1H), 3.52 – 3.37 (m, 2H), 3.32 (s, 3H), 2.79 (s, 3H), 1.80 – 1.64 (m, 1H), 1.59 – 1.47 (m, 1H), 1.47 – 1.36 (m, 1H), 1.02 – 0.90 (m, 6H). MS (ESI ⁺) : [M+H] ⁺ 373.3.
208		C ₂₁ H ₂₀ N ₄ O ₂ S	392.48	>98%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 343K) of major tautomer δ _H 10.37 (br s, 1H, NH, D ₂ O exchanged), 8.79 – 8.57 (m, 1H), 8.06 – 7.99 (m, 1H), 7.95 – 7.83 (br s, 1H, NH, D ₂ O exchanged), 7.83 (d, <i>J</i> = 8.4 Hz, 1H), 7.47 (d, <i>J</i> = 7.6 Hz, 2H), 7.38 (t, <i>J</i> = 7.5 Hz, 2H), 7.28 (t, <i>J</i> = 7.3 Hz, 1H), 6.39 (s, 1H), 5.26 – 5.12 (m, 1H), 3.79 – 3.72 (m, 1H), 3.66 (dd, <i>J</i> = 10.1, 5.1 Hz, 1H), 3.34 (s, 3H), 2.80 (s, 3H). MS (ESI ⁺) : [M+H] ⁺ 393.2.
209		C ₂₂ H ₂₄ N ₄ O ₂ S	392.52	>98%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 300K) of major tautomer δ _H 9.95 (br s, 1H, NH, D ₂ O exchanged), 8.94 (s, 1H), 8.03 (d, <i>J</i> = 8.5 Hz, 1H), 7.84 (d, <i>J</i> = 8.6 Hz, 1H), 7.05 (br s, 1H, NH, D ₂ O exchanged), 6.39 (s, 1H), 2.80 (s, 3H), 2.36 – 1.98 (m, 9H), 1.90 – 1.56 (m, 6H). MS (ESI ⁺) : [M+H] ⁺ 393.3.

Cpd N°	Structure	Formula	MW	HPLC	Description
210		C ₂₂ H ₂₄ N ₄ O ₂ S	408.52	>98%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 343K) of major tautomer δ _H 9.73 (br s, 1H, NH, D ₂ O exchanged), 8.88 (s, 1H), 8.02 (d, <i>J</i> = 8.5 Hz, 1H), 7.83 (d, <i>J</i> = 8.5 Hz, 1H), 6.81 (br s, 1H, NH, D ₂ O exchanged), 6.40 (s, 1H), 4.39 (br s, 1H, OH, D ₂ O exchanged), 2.80 (s, 3H), 2.28 – 2.19 (m, 2H), 2.15 – 1.90 (m, 6H), 1.74 – 1.47 (m, 6H). MS (ESI ⁺) : [M+H] ⁺ 409.3.
211		C ₂₁ H ₂₂ N ₄ O ₃ S	410.49	>80%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 343K) of major tautomer δ _H 10.04 (br s, 1H, NH, D ₂ O exchanged), 9.35 (s, 1H), 8.98 (s, 1H), 8.15 (d, <i>J</i> = 8.7 Hz, 1H), 8.02 (d, <i>J</i> = 8.6 Hz, 1H), 7.24 (br s, 1H, NH, D ₂ O exchanged), 6.42 (s, 1H), 4.71 (s, 2H, OH, D ₂ O exchanged), 2.30 – 2.20 (m, 1H), 2.03 – 1.78 (m, 6H), 1.65 – 1.37 (m, 6H). MS (ESI ⁺) : [M+H] ⁺ 411.1.
212		C ₂₁ H ₁₉ F ₃ N ₄ O ₃ S	432.47	>98%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 343K) of major tautomer δ _H 10.12 (br s, 1H, NH, D ₂ O exchanged), 9.34 (s, 1H), 9.15 – 8.77 (m, 1H), 8.31 – 7.93 (m, 2H), 7.50 (br s, 1H, NH, D ₂ O exchanged), 6.52 (s, 1H), 2.48 – 2.05 (m, 12H). MS (ESI ⁺) : [M+H] ⁺ 433.2.
213		C ₁₉ H ₂₄ N ₄ O ₂ S	372.49	>98%	Yellow solid. ¹ H NMR (400 MHz, DMSO- <i>d</i> ₆ , 343K) of major tautomer δ _H 10.35 (br s, 1H, NH, D ₂ O exchanged), 9.30 (s, 1H), 8.91 (s, 1H), 8.16 (d, <i>J</i> = 8.6 Hz, 1H), 8.00 (d, <i>J</i> = 8.6 Hz, 1H), 7.18 (br s, 1H, NH, D ₂ O exchanged), 6.42 (s, 1H), 4.24 – 4.06 (m, 1H), 3.62 – 3.39 (m, 4H), 1.80 – 1.63 (m, 1H), 1.59 – 1.38 (m, 2H), 1.14 (t, <i>J</i> = 7.0 Hz, 3H), 1.05 – 0.82 (m, 6H). MS (ESI ⁺) : [M+H] ⁺ 373.1.

Cpd N°	Structure	Formula	MW	HPLC	Description
214		$C_{24}H_{26}N_4O_2S$	434.56	97%	Yellow solid. 1H NMR (400 MHz, DMSO- d_6 , 343K) of major tautomer δ_H 10.40 (br s, 1H, NH, D $_2$ O exchanged), 9.30 (s, 1H), 8.91 (s, 1H), 8.18 (d, J = 8.6 Hz, 1H), 8.00 (d, J = 8.6 Hz, 1H), 7.55 – 7.06 (m, 5H + NH, D $_2$ O exchanged), 6.43 (s, 1H), 4.66 – 4.49 (m, 2H), 4.36 – 4.14 (m, 1H), 3.66 – 3.49 (m, 2H), 1.81 – 1.63 (m, 1H), 1.62 – 1.42 (m, 2H), 1.08 – 0.87 (m, 6H). MS (ESI $^+$) : [M+H] $^+$ 435.2.
215		$C_{24}H_{25}FN_4O_2S$	452.55	>98%	Yellow solid. 1H NMR (400 MHz, DMSO- d_6 , 343K) of major tautomer δ_H 10.39 (br s, 1H, NH, D $_2$ O exchanged), 9.30 (s, 1H), 8.89 (s, 1H), 8.17 (dd, J = 8.6, 1.6 Hz, 1H), 8.00 (d, J = 8.6 Hz, 1H), 7.37 (dd, J = 8.5, 5.7 Hz, 2H), 7.24 (br s, 1H, NH, D $_2$ O exchanged), 7.10 (t, J = 8.9 Hz, 2H), 6.42 (s, 1H), 4.61 – 4.47 (m, 2H), 4.31 – 4.12 (m, 1H), 3.56 (d, J = 5.4 Hz, 2H), 1.78 – 1.64 (m, 1H), 1.61 – 1.40 (m, 2H), 1.05 – 0.84 (m, 6H). MS (ESI $^+$) : [M+H] $^+$ 453.1.
216		$C_{20}H_{24}N_4O_2S$	384.50	>98%	Yellow solid. 1H NMR (400 MHz, DMSO- d_6 , 343K) of major tautomer δ_H 10.34 (br s, 1H, NH, D $_2$ O exchanged), 9.30 (s, 1H), 8.91 (s, 1H), 8.16 (d, J = 8.5 Hz, 1H), 8.00 (d, J = 8.5 Hz, 1H), 7.18 (br s, 1H, NH, D $_2$ O exchanged), 6.42 (s, 1H), 4.28 – 4.05 (m, 1H), 3.63 – 3.47 (m, 2H), 3.42 – 3.31 (m, 1H), 1.79 – 1.60 (m, 1H), 1.57 – 1.34 (m, 2H), 1.04 – 0.83 (m, 6H), 0.57 – 0.37 (m, 4H). MS (ESI $^+$) : [M+H] $^+$ 385.1.

PATHOLOGIES

The compounds of formula (I) may be useful in the treatment and/or in the prevention of a disease selected from cognitive deficits associated with Down syndrome (Trisomy 21); Alzheimer's disease and related diseases; dementia; tauopathies; and other neurodegenerative diseases (Parkinson's disease; Pick disease, including Niemann-Pick Type C Disease); CDKL5 Deficiency Disorder; McDermid syndrome; autism; type 1 and type 2 diabetes; abnormal folate and methionine metabolism; osteoarthritis, in particular knee osteoarthritis; Duchenne muscular dystrophy; several cancers, such as brain cancer, including glioblastoma, leukemia, including megakaryoblastic leukemia, acute lymphoblastic leukemia, head and neck squamous cell carcinoma, pancreatic cancer, including pancreatic ductal adenocarcinoma, prostate cancer, gastrointestinal cancer, breast cancer, such as Triple-negative breast cancer (TNBC), tissue cancer, including liposarcoma, Hedgehog/GLI-dependent cancer, liver cancer, including Hepatocellular carcinoma and viral infections, such as caused by Human immunodeficiency virus type 1 (HIV-1), Human cytomegalovirus (HCMV), Influenza A, Herpes virus, rhesus macaque cytomegalovirus, varicella-zoster virus, herpes simplex virus (HSV), Hepatitis C virus, Chikungunya virus, Dengue virus, Influenza virus and Severe acute respiratory syndrome (SARS) coronavirus, Cytomegalovirus and Human papillomavirus; neuroinflammation; anemia; infections caused by unicellular parasites, such as malaria, Leishmaniasis, Chagas and sleeping sickness (*Trypanosoma* sp.), and cattle diseases due to unicellular pathogens and for regulating body temperature.

According to a particular embodiment, the compounds of formula (I) of the present invention may be useful in the treatment and/or in the prevention of a disease selected from cognitive deficits associated with Down syndrome (Trisomy 21); Alzheimer's disease and related diseases; dementia; tauopathies; other neurodegenerative diseases (Parkinson's disease; Pick disease, including Niemann-Pick Type C Disease); CDKL5 Deficiency Disorder; type 1 and type 2 diabetes; abnormal folate and methionine metabolism; osteoarthritis, in particular knee osteoarthritis; Duchenne muscular dystrophy; several cancers, such as brain cancer, including glioblastoma, leukemia, including megakaryoblastic leukemia and acute lymphoblastic leukemia, head and neck squamous cell carcinoma, pancreatic cancer, including pancreatic ductal adenocarcinoma, prostate cancer, gastrointestinal cancer and breast cancer, such as Triple-negative breast cancer (TNBC)

and viral infections, such as caused by Human immunodeficiency virus type 1 (HIV-1), Human cytomegalovirus (HCMV), Influenza A, Herpes virus, rhesus macaque cytomegalovirus, varicella-zoster virus and herpes simplex virus (HSV) and for regulating body temperature. Said diseases are more particularly associated with the abnormalities in
5 DYRK1A and/or CLK1 dosage.

Still according to this particular embodiment, the compounds of formula (I) of the present invention may be useful in the treatment and/or prevention of a disease selected from Down syndrome, Alzheimer's disease, dementia, tauopathies, Parkinson's disease, Niemann-Pick Type C Disease, CDKL5 Deficiency Disorder and Phelan-McDermid
10 syndrome and their associated cognitive and motor conditions, more particularly due to high expression and activity of DYRK1A.

Still according to this particular embodiment, the compounds of formula (I) of the present invention may be useful in the treatment and/or prevention of a disease selected from Down syndrome, Alzheimer's disease and related Tauopathies, Parkinson's disease, the
15 cognitive/motor disorders associated therewith, or one or more symptoms of such diseases. As a typical symptom of such diseases is a decline in learning and memory and social interactions.

Still according to this particular embodiment, the compounds of formula (I) of the present invention may be useful in combatting cognitive decline associated with Down
20 syndrome (Trisomy 21), in learning and memory, in particular associated with the cognitive or neurodegenerative disorders as mentioned above.

Still according to this particular embodiment, the compounds of formula (I) of the present invention may be useful in the treatment and/or prevention of type 1 and type 2
25 diabetes.

The compounds of formula (I) of the present invention may be useful in the treatment and/or prevention of type 1 and type 2 diabetes either by direct treatment of the diabetic patient or by treating pancreatic islets or β -cells prior to transplantation into
diabetic patients.

Still according to this particular embodiment, the compounds of formula (I) of the present invention may be useful in the treatment and/or prevention of viral infections,
30 in particular caused by such as caused by Human immunodeficiency virus type 1 (HIV-1), Human cytomegalovirus (HCMV), Influenza A, Herpes virus, rhesus macaque

cytomegalovirus, varicella-zoster virus and herpes simplex virus (HSV), and in particular by Herpes, Coronaviruses, Cytomegaloviruses and Influenzas. These infections may be associated with high expression and activity of DYRK1A and/or CLK1, and optionally additionally with dual inhibitors of CLKs/DYRKs.

5 Acute respiratory disease has recently been caused by a new coronavirus (SARS-CoV-2, previously known as 2019-nCoV), also known here as coronavirus 2019 (COVID-19), which belongs to *Coronaviridae*. The compounds of formula (I) according to the present invention can also treat said infection caused by SARS-CoV-2 virus.

 Still according to this particular embodiment, the compounds of formula (I) of
10 the present invention may be useful in the treatment and/or prevention of cancers, such as brain cancer, including glioblastoma, leukemia, including megakaryoblastic leukemia and acute lymphoblastic leukemia, head and neck squamous cell carcinoma, pancreatic cancer, including pancreatic ductal adenocarcinoma, prostate cancer, gastrointestinal cancer and breast cancer, such as Triple-negative breast cancer (TNBC). These cancers may be
15 associated with high expression and activity of DYRK1A and/or CLK1, and optionally additionally with dual inhibitors of CLKs/DYRKs.

 Still according to this particular embodiment, the compounds of formula (I) of the present invention may be useful in the treatment and/or prevention of osteoarthritis. Osteoarthritis may be associated with high expression and activity of DYRK1A and/or
20 CLK2.

 Still according to this particular embodiment, the compounds of formula (I) of the present invention may be useful in the treatment and/or prevention of infections caused by unicellular parasites, such as such as malaria, Leishmaniasis, Chagas and sleeping sickness (*Trypanosoma* sp.), and cattle diseases due to unicellular pathogens Said parasitic
25 infections may be associated with expression and activity of DYRKs/CLKs.

 Still according to this particular embodiment, the compounds of formula (I) of the present invention may be useful in the regulation of the body temperature. Said body temperature regulation may be associated with expression and activity of CLKs.

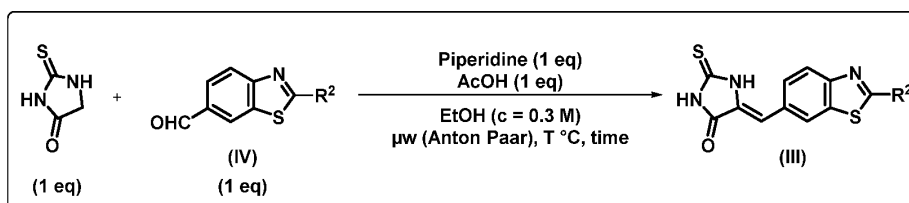
 According to another particular embodiment, the compounds of formula (I) of
30 the present invention may be useful in the treatment and/or in the prevention of a disease selected from Phelan-McDermid syndrome; autism; further viral infections, such as caused by Hepatitis C virus, Chikungunya virus, Dengue virus, Influenza virus and Severe acute

respiratory syndrome (SARS) coronavirus, Cytomegalovirus and Human papillomavirus; further cancers, such as tissue cancer, including liposarcoma, Hedgehog/GLI-dependent cancer, liver cancer, including Hepatocellular carcinoma, neuroinflammation, anemia, infections caused by unicellular parasites, such as malaria, Leishmaniasis, Chagas
 5 and sleeping sickness (*Trypanosoma* sp.), and cattle diseases due to unicellular pathogens. Said diseases are more particularly associated with the abnormalities in other DYRKs (DYR1B, 2, 3, 4) and the closely related further cdc2-like kinases (CLKs) (CLK 2, 3, 4).

The following examples are provided as illustrations and in no way limit the
 10 scope of this invention.

The following examples illustrate in detail the preparation of some compounds according to the invention. The structures of the products obtained have been confirmed by NMR analyses and mass spectroscopy.

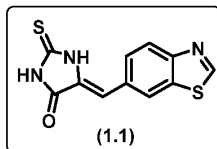
15 **Example 1: General protocol 1 - Synthesis of (5Z)-5-heteroaryl-2-thioxoimidazolidin-4-ones**



In the above scheme, R² represents a hydrogen atom or a (C₁-C₃)alkyl group, in particular R² represents a hydrogen atom or a methyl group.

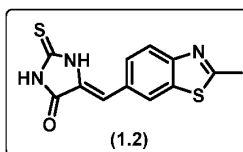
20 **GPI:** a stirred solution of 2-thiohydantoin (1 eq), the appropriate heteroarylcarbaldehyde (1 eq), piperidine (1 eq) and AcOH (1 eq) in EtOH (c = 0.3 M) was heated in a sealed tube in a microwave oven (Anton Paar) for the appropriate time, at the indicated temperature. Upon completion (followed by consumption of the aldehyde on TLC), the reaction medium was cooled down and added dropwise onto water. The
 25 precipitated solid was stirred for 30 min, filtered off on a fritted glass funnel, thoroughly dried, and could be used in the next step without further purification. When necessary, a final trituration in EtOH may help remove trace impurities without significant yield loss.

Example 1.1: Synthesis of (5Z)-5-(1,3-benzothiazol-6-ylmethylene)-2-thioxo-imidazolidin-4-one (1.1)



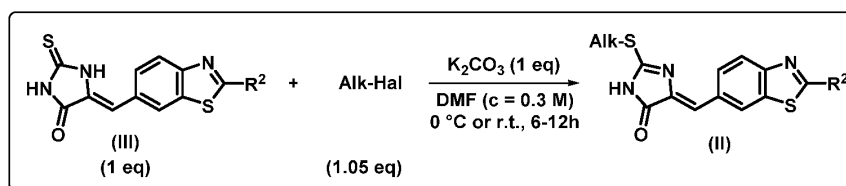
Compound (1.1) was synthesized according to **GP1**: reaction was carried out on a 4.2 mmol scale of 2-thiohydantoin, benzothiazole-6-carbaldehyde, AcOH and piperidine. Reaction temperature: 110 °C, time: 90 min. The yellow solid was triturated in EtOH after filtration. Yellow solid, 89% (978 mg). ¹H NMR (400 MHz, DMSO-*d*₆) δ_H 12.44 (br s, 1H, NH, D₂O exchanged), 12.25 (br s, 1H, NH, D₂O exchanged), 9.47 (s, 1H), 8.61 (d, *J* = 1.8 Hz, 1H), 8.09 (d, *J* = 8.5 Hz, 1H), 7.84 (dd, *J* = 8.6, 1.8 Hz, 1H), 6.64 (s, 1H). ¹³C NMR (101 MHz, DMSO-*d*₆) δ_C 179.3, 165.7, 158.0, 153.1, 134.4, 129.8, 128.9, 128.1, 123.7, 123.1, 110.9. MS (ESI⁺): [M+H]⁺ 262.1.

Example 1.2: Synthesis of (5Z)-5-[(2-methyl-1,3-benzothiazol-6-yl)methylene]-2-thioxo-imidazolidin-4-one (1.2)



Compound (1.2) was synthesized according to **GP1**: reaction was carried out on a 7.34 mmol scale of 2-thiohydantoin, 2-methyl-1,3-benzothiazole-6-carbaldehyde, AcOH and piperidine. Reaction temperature: 110 °C, time: 90 min. The yellow solid was triturated in EtOH after filtration. Yellow solid, 94% (1.898 g). ¹H NMR (400 MHz, DMSO-*d*₆) δ_H 12.42 (br s, 1H, NH, D₂O exchanged), 12.21 (br s, 1H, NH, D₂O exchanged), 8.48 (s, 1H), 7.91 (d, *J* = 8.4 Hz, 1H), 7.77 (d, *J* = 8.5 Hz, 1H), 6.60 (s, 1H), 2.82 (s, 3H). ¹³C NMR (101 MHz, DMSO-*d*₆) δ_C 179.2, 169.1, 165.7, 153.1, 136.0, 129.0, 128.8, 127.7, 123.0, 122.0, 111.1, 20.0. MS (ESI⁺): [M+H]⁺ 275.9.

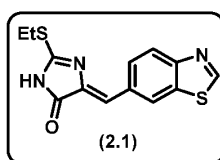
Example 2: General protocol 2 - S-Alkylation of (5Z)-5-heteroaryl-2-thioxo-imidazolidin-4-ones



In the above scheme, Hal represents a halogen atom, in particular selected from an iodine and a bromine atom, Alk is a (C₁-C₅) alkyl and R² represents a hydrogen atom or a (C₁-C₃)alkyl group, in particular R² represents a hydrogen atom or a methyl group.

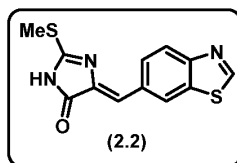
- 5 **GP2:** The appropriate alkyl iodide (1.05 eq) was added dropwise to a stirred solution of (5Z)-5-heteroaryl-2-thioxoimidazolidin-4-one (1 eq) and K₂CO₃ (1 eq) in DMF (c = 0.3 M) at the appropriate temperature. The resulting mixture was stirred at the indicated temperature, for the appropriate time. Upon completion (TLC), the mixture was poured into water. The precipitated solid was stirred for 30 min and filtered off on a fritted glass funnel, thoroughly dried, and could be used in the next step without further purification. Trace impurities resulting from the double alkylation may be removed by FC: elution: cyclohexane/AcOEt 7/3 to 3/7 or trituration.
- 10

- 15 **Example 2.1: Synthesis of (4Z)-4-(1,3-benzothiazol-6-ylmethylene)-2-ethylsulfanyl-1H-imidazol-5-one (2.1)**



- Compound (2.1) was synthesized according to **GP2**: reaction was carried out with (5Z)-5-(1,3-benzothiazol-6-ylmethylene)-2-thioxoimidazolidin-4-one (7.69 mmol) and EtI, at room temperature, for 12h. Yellow solid, 89% (978 mg). ¹H NMR (400 MHz, DMSO-*d*₆) δ_H 11.85 (br s, 1H, NH, D₂O exchanged), 9.46 (s, 1H), 8.90 (s, 1H), 8.45 (d, *J* = 8.6 Hz, 1H), 8.12 (d, *J* = 8.6 Hz, 1H), 6.88 (s, 1H), 3.70 – 3.17 (m, 2H), 1.44 (t, *J* = 7.3 Hz, 3H). ¹³C NMR (101 MHz, DMSO-*d*₆) δ_C 170.5, 165.0, 157.8, 153.2, 139.5, 134.1, 132.0, 129.2, 125.4, 123.0, 119.9, 24.4, 14.5. MS (ESI⁺): [M+H]⁺ 289.9.
- 20

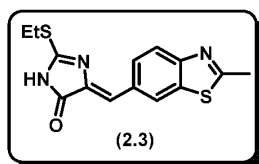
- 25 **Example 2.2: Synthesis of (4Z)-4-(1,3-benzothiazol-6-ylmethylene)-2-methylsulfanyl-1H-imidazol-5-one (2.2)**



Compound (2.2) was synthesized according to **GP2**: reaction was carried out with (5Z)-5-(1,3-benzothiazol-6-ylmethylene)-2-thioxo-imidazolidin-4-one (3.83 mmol) and MeI, at 0 °C, for 6h. The yellow solid was triturated in DCM after filtration. Yellow solid, 83% (879 mg). ¹H NMR (400 MHz, DMSO-*d*₆) δ_H 11.89 (br s, 1H, NH, D₂O exchanged), 9.46 (s, 1H), 8.92 (d, *J* = 1.6 Hz, 1H), 8.45 (d, *J* = 8.6 Hz, 1H), 8.12 (d, *J* = 8.6 Hz, 1H), 6.88 (s, 1H), 2.72 (s, 3H). ¹³C NMR (101 MHz, DMSO-*d*₆) δ 171.1, 166.1, 158.3, 153.7, 140.0, 134.6, 132.4, 129.8, 125.9, 123.5, 120.4, 12.8. MS (ESI⁺): [M+H]⁺ 275.9.

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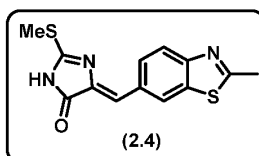
Example 2.3: Synthesis of (4Z)-2-ethylsulfanyl-4-[(2-methyl-1,3-benzothiazol-6-yl)methylene]-1H-imidazol-5-one (2.3)



Compound (2.3) was synthesized according to **GP2**: reaction was carried out with (5Z)-5-[(2-methyl-1,3-benzothiazol-6-yl)methylene]-2-thioxo-imidazolidin-4-one (1.45 mmol) and EtI, at room temperature, for 12h. Yellow solid, 84% (368 mg). ¹H NMR (400 MHz, DMSO-*d*₆) δ_H 11.82 (br s, 1H, NH, D₂O exchanged), 8.75 (s, 1H), 8.39 (d, *J* = 8.5 Hz, 1H), 7.94 (d, *J* = 8.6 Hz, 1H), 6.85 (s, 1H), 3.43 – 3.21 (m, 2H), 2.82 (s, 3H), 1.44 (t, *J* = 7.3 Hz, 3H). ¹³C NMR (101 MHz, DMSO-*d*₆) δ_C 170.5, 169.0, 164.6, 153.3, 139.2, 135.7, 131.2, 129.1, 124.8, 122.0, 120.1, 24.3, 19.9, 14.5. MS (ESI⁺): [M+H]⁺ 303.9.

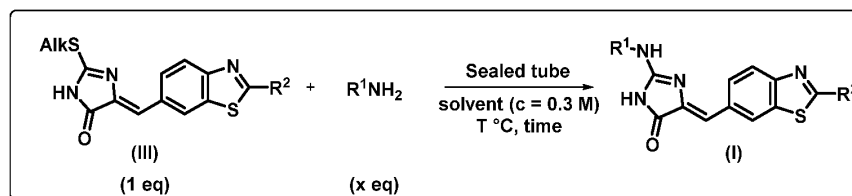
20

Example 2.4: Synthesis of (4Z)-4-[(2-methyl-1,3-benzothiazol-6-yl)methylene]-2-methylsulfanyl-1H-imidazol-5-one (2.4)



Compound (2.4) was synthesized according to **GP2**: reaction was carried out with (5*Z*)-5-[(2-methyl-1,3-benzothiazol-6-yl)methylene]-2-thioxo-imidazolidin-4-one (3.63 mmol) and MeI, at room temperature, for 6h. The yellow solid was triturated in DCM after filtration. Yellow solid, 92% (962 mg). ¹H NMR (400 MHz, DMSO-*d*₆) δ_H 11.86 (br s, 1H, NH, D₂O exchanged), 8.77 (s, 1H), 8.39 (d, *J* = 8.6 Hz, 1H), 7.94 (d, *J* = 8.6 Hz, 1H), 6.85 (s, 1H), 2.82 (s, 3H), 2.71 (s, 3H). ¹³C NMR (101 MHz, DMSO-*d*₆) δ_C 170.6, 169.0, 165.3, 153.3, 139.2, 135.7, 131.2, 129.3, 124.9, 121.9, 120.2, 19.9, 12.3. MS (ESI⁺): [M+H]⁺ 290.1.

Example 3: General protocol 3 - Addition of aliphatic and aromatic amines on (4*Z*)-4-(1,3-benzothiazol-6-ylmethylene)-2-alkylsulfanyl-1*H*-imidazol-5-ones



In the above scheme, Alk is a (C₁-C₅) alkyl and R² represents a hydrogen atom or a (C₁-C₃) alkyl group, in particular R² represents a hydrogen atom or a methyl group.

The appropriate amine^(a) (x eq) was added to a stirred suspension of (4*Z*)-4-heteroaryl-2-alkylsulfanyl-1*H*-imidazol-5-one^(b) (1 eq) in the appropriate solvent mixture (c = 0.3 M) in a sealed tube (heating block or μw). The mixture was thoroughly purged with vacuum/argon cycles and heated (μw or heating block) at the appropriate temperature for the indicated time. Upon completion (followed by consumption of the isothioureia on TLC), the mixture was brought back to room temperature.

- **GP3-A: direct precipitation of the desired product:** The reaction medium was stirred 1h at 0 °C. The precipitated solid was filtered off on a fritted-glass funnel. High purity may be achieved after filtration by washing, reprecipitation, trituration, or recrystallization.

- **GP3-B: the product failed to precipitate:** the reaction mixture was concentrated *in vacuo*, adsorbed on silica, and purified by FC. High purity may be achieved after filtration by reprecipitation, trituration, or recrystallization.

- **GP3-C: the product failed to precipitate:** the reaction mixture was concentrated *in vacuo*. The resulting crude was triturated in EtOH (at r.t. or reflux), filtered off on a fritted-glass funnel. High purity may be achieved after filtration by purification, reprecipitation, trituration, or recrystallization.

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(a) When amine hydrochlorides were used, they were quenched *in situ* with TEA or DIPEA.

(b) May require activation with AcOH, depending on the amine.

10 Selected examples from sub-group A1:

Example 3.1: Synthesis of (4Z)-4-(1,3-benzothiazol-6-ylmethylene)-2-(cyclohexylamino)-1H-imidazol-5-one (6)

Reaction was carried out according to GP3-A, in THF (0.3 M), on a 2.73 mmol scale of (2.1), with 4 eq of cyclohexylamine at 110 °C (sealed tube, heating block), for 12h. The product directly precipitated in the reaction medium: it was isolated after filtration, washing with cold THF, then pentane. Isolated yield: 34%.

Example 3.2: Synthesis of (4Z)-4-(1,3-benzothiazol-6-ylmethylene)-2-(cycloheptylmethylamino)-1H-imidazol-5-one (7)

Reaction was carried out according to GP3-B, in THF (0.3 M), on a 1.01 mmol scale of (2.1), with 4 eq of cycloheptylmethylamine at 110 °C (sealed tube, heating block), for 12h. Purification by FC (elution: DCM/MeOH: 99/1 to 93/7). The final product required a reprecipitation from DCM/pentane at 0 °C. Isolated yield: 23%.

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Example 3.3: Synthesis of (4Z)-4-(1,3-benzothiazol-6-ylmethylene)-2-(cycloheptylamino)-1H-imidazol-5-one (8)

Reaction was carried out according to GP3-A, in THF (0.3 M), on a 4.84 mmol scale of (2.1), with 4 eq of cycloheptylamine at 110 °C (sealed tube, heating block), for 12h. The product directly precipitated in the reaction medium: it was isolated after filtration, washing with cold THF, then pentane. Isolated yield: 49%.

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Example 3.4: Synthesis of (4Z)-4-(1,3-benzothiazol-6-ylmethylene)-2-(cyclooctylamino)-1H-imidazol-5-one (9)

Reaction was carried out according to GP3-A, in THF (0.3 M), on a 2.73 mmol scale of (2.1) and 4 eq of cyclooctylamine at 110 °C (sealed tube, heating block), for 12h.
5 The product directly precipitated in the reaction medium it was isolated after filtration, washing with cold THF, then pentane. Isolated yield: 58%.

Example 3.5: Synthesis of (4Z)-2-(1-adamantylamino)-4-(1,3-benzothiazol-6-ylmethylene)-1H-imidazol-5-one (16)

10 Reaction was carried out according to GP3-B, in THF (0.3 M), on a 2.54 mmol scale of (2.2), with 3 eq of 1-adamantylamine and 15 eq of AcOH, at 160 °C (sealed tube, heating block), for 24h. Purification by FC (elution: DCM/MeOH: 99/1 to 93/7). The final product required two successive triturations in refluxing EtOH. Isolated yield: 61%.

Example 3.6: Synthesis of (4Z)-2-(2-adamantylamino)-4-(1,3-benzothiazol-6-ylmethylene)-1H-imidazol-5-one (17)

Reaction was carried out according to GP3-B, in THF (0.3 M), on a 746 μmol scale of (2.2), with 4 eq of 2-adamantylamine and 15 eq of AcOH, at 170 °C (sealed tube, heating block), for 12h. Purification by FC (elution: DCM/MeOH: 99/1 to 93/7). The final
20 product required trituration in EtOH at 0 °C. Isolated yield: 44%.

Example 3.7: Synthesis of (4Z)-4-(1,3-benzothiazol-6-ylmethylene)-2-[(trans-5-hydroxy-2-adamantyl)amino]-1H-imidazol-5-one (19)

Reaction was carried out according to GP3-B, in THF (0.3 M), on a 746 μmol scale of (2.2), with 4 eq of *trans*-4-aminoadamantan-1-ol and 15 eq of AcOH, at 170 °C
25 (sealed tube, heating block), for 12h. Purification by FC (elution: DCM/MeOH: 99/1 to 93/7). The final product required trituration in EtOH at 0 °C. Isolated yield: 27%.

Example 3.8: Synthesis of (4Z)-4-(1,3-benzothiazol-6-ylmethylene)-2-[(3-hydroxy-1-adamantyl)amino]-1H-imidazol-5-one (20)

Reaction was carried out according to GP3-B, in THF (0.3 M), on a 746 μmol scale of (2.2), with 4 eq of 3-amino-1-adamantanol and 15 eq of AcOH, at 160 °C (sealed

tube, heating block), for 12h. Purification by FC (elution: DCM/MeOH: 99/1 to 93/7). The final product required trituration in EtOH at 0 °C. Isolated yield: 59%.

**Example 3.9: Synthesis of (4Z)-4-(1,3-benzothiazol-6-ylmethylene)-2-
5 [[(1R,2R,3R,5S)-2,6,6-trimethylnorpinan-3-yl]amino]-1H-imidazol-5-one (22)**

Reaction was carried out according to GP3-B, in THF (0.3 M), on a 746 µmol scale of (2.1), with 4 eq of (1R,2R,3R,5S)-3-pinamine, at 120 °C (sealed tube, heating block), for 12h. Purification by FC (elution: DCM/MeOH: 99/1 to 93/7). The final product required a reprecipitation from DCM/pentane at 0 °C. Isolated yield: 60%.

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**Example 3.10: Synthesis of (±)-(4Z)-4-(1,3-benzothiazol-6-ylmethylene)-2-
(spiro[2.5]octan-2-ylamino)-1H-imidazol-5-one (25)**

Reaction was carried out according to GP3-B, in THF (0.3 M), on a 773 µmol scale of (2.1), with 2 eq of (±)-spiro[2.5]octan-2-amine hydrochloride and 2 eq of TEA, at
15 110 °C (sealed tube, heating block), for 12h. Purification by FC (elution: DCM/MeOH: 99/1 to 93/7). The final product required a reprecipitation from DCM/pentane at 0 °C. Isolated yield: 61%.

**Example 3.11: Synthesis of (4Z)-4-(1,3-benzothiazol-6-ylmethylene)-2-
20 [[(2R)-1,7,7-trimethylnorbornan-2-yl]amino]-1H-imidazol-5-one (27)**

Reaction was carried out according to GP3-B, in THF (0.3 M) on a 746 µmol scale of (2.1), with 3 eq of (R)-(+)-bornylamine, at 150 °C (sealed tube, heating block), for 8h. Purification by FC (elution: DCM/MeOH: 99/1 to 93/7). The final product required a reprecipitation from DCM/pentane at 0 °C. Isolated yield: 34%.

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**Example 3.12: Synthesis of (4Z)-4-(1,3-benzothiazol-6-ylmethylene)-2-
[[(1R)-1-(hydroxymethyl)-3-methyl-butyl]amino]-1H-imidazol-5-one (34)**

Reaction was carried out according to GP3-B, in THF (0.3 M) on a 746 µmol scale of (2.1), with 4 eq of D-leucinol, at 110 °C (sealed tube, heating block), for 12h.
30 Purification by FC (elution: DCM/MeOH: 99/1 to 93/7). The final product required a reprecipitation from DCM/pentane at 0 °C. Isolated yield: 39%.

Example 3.13: Synthesis of (4Z)-4-(1,3-benzothiazol-6-ylmethylene)-2-[[*(1R)*-1-(methoxymethyl)-3-methyl-butyl]amino]-1*H*-imidazol-5-one (35)

Reaction was carried out according to GP3-B, in THF (0.3 M) on a 2.91 mmol scale of (2.2), with 2.5 eq of (*2R*)-1-methoxy-4-methyl-pentan-2-amine, at 120 °C (sealed tube, heating block), for 12h. Purification by FC (elution: DCM/MeOH: 99/1 to 93/7). The final product required a reprecipitation from DCM/pentane at 0 °C. Isolated yield: 74%.

Example 3.14: Synthesis of (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[*(1S)*-1-(hydroxymethyl)-3-methyl-butyl]amino]-1*H*-imidazol-5-one (36)

Reaction was carried out according to GP3-B, in THF (0.3 M) on a 746 μmol scale of (2.1), with 4 eq of L-leucinol, at 110 °C (sealed tube, heating block), for 12h. Purification by FC (elution: DCM/MeOH: 99/1 to 93/7). The final product required a reprecipitation from DCM/pentane at 0 °C. Isolated yield: 39%.

Example 3.15: Synthesis of (4Z)-4-(1,3-benzothiazol-6-ylmethylene)-2-[[1-(fluoromethyl)-3-methyl-butyl]amino]-1*H*-imidazol-5-one (40)

Reaction was carried out according to GP3-B, in THF (0.3 M) on a 908 μmol scale of (2.2), with 1.2 eq of (±)-1-fluoro-4-methyl-pentan-2-amine, at 150 °C (sealed tube, heating block), for 96h. Purification by FC (elution: DCM/MeOH: 99/1 to 93/7) then PTLC. Isolated yield: 8%.

Example 3.16: Synthesis of (±)-(4Z)-4-(1,3-benzothiazol-6-ylmethylene)-2-[[*trans*-2-methoxycyclopentyl]amino]-1*H*-imidazol-5-one (48)

Reaction was carried out according to GP3-B, in THF (0.3 M) on a 272 μmol scale of (2.2), with 3 eq of (±)-*trans*-2-methoxycyclopentanamine hydrochloride and 4 eq of DIPEA, at 120 °C (sealed tube, heating block), for 7h. Purification by FC (elution: DCM/MeOH : 99/1 to 93/7). The final product required a trituration in refluxing EtOH. Isolated yield: 81%.

Example 3.17: Synthesis of (±)-(4Z)-4-(1,3-benzothiazol-6-ylmethylene)-2-[[*cis*-3-hydroxycyclohexyl]amino]-1*H*-imidazol-5-one (55)

Reaction was carried out according to GP3-B, in THF (0.3 M) on a 272 μ mol scale of (2.2), with 3 eq of ($\pm$)-*cis*-3-aminocyclohexanol hydrochloride and 4 eq of DIPEA, at 120 °C (sealed tube, heating block) for 24h. Purification by FC (elution: DCM/MeOH : 99/1 to 93/7). Isolated yield: 82%.

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Example 3.18: Synthesis of ($\pm$)-(4*Z*)-4-(1,3-benzothiazol-6-ylmethylene)-2-[[*trans*-3-hydroxycyclohexyl]amino]-1*H*-imidazol-5-one (56)

Reaction was carried out according to GP3-B, in THF (0.3 M) on a 272 μ mol scale of (2.2), with 3 eq of ($\pm$)-*trans*-3-aminocyclohexanol hydrochloride and 4 eq of DIPEA, at 120 °C (sealed tube, heating block) for 24h. Purification by FC (elution: DCM/MeOH : 99/1 to 93/7) then PTLC. Isolated yield: 82%.

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Example 3.19: Synthesis of ($\pm$)-(4*Z*)-4-(1,3-benzothiazol-6-ylmethylene)-2-[[*trans*-2-methoxycyclohexyl]amino]-1*H*-imidazol-5-one (59)

Reaction was carried out according to GP3-B, in THF (0.3 M) on a 272 μ mol scale of (2.2), with 3 eq of ($\pm$)-*trans*-2-methoxycyclohexanamine hydrochloride and 4 eq of DIPEA, at 120 °C (sealed tube, heating block) for 28h. Purification by FC (elution: DCM/MeOH : 99/1 to 93/7). Isolated yield: 82%.

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Example 3.20: Synthesis of ($\pm$)-(4*Z*)-4-(1,3-benzothiazol-6-ylmethylene)-2-[[*cis*-2-hydroxycycloheptyl]amino]-1*H*-imidazol-5-one (61)

Reaction was carried out according to GP3-B, in THF (0.3 M) on a 272 μ mol scale of (2.2), with 3 eq of ($\pm$)-*cis*-2-aminocycloheptanol hydrochloride and 4 eq of DIPEA, at 120 °C (sealed tube, heating block), for 28h. Purification by FC (elution: DCM/MeOH : 99/1 to 93/7). The final product required a trituration in refluxing EtOH. Isolated yield: 56%.

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Example 3.21: Synthesis of ($\pm$)-(4*Z*)-4-(1,3-benzothiazol-6-ylmethylene)-2-[[*trans*-2-hydroxycycloheptyl]amino]-1*H*-imidazol-5-one (62)

Reaction was carried out according to GP3-B, in THF (0.3 M) on a 272 μ mol scale of (2.2), with 3 eq of ($\pm$)-*trans*-2-aminocycloheptanol, at 120 °C (sealed tube, heating

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block), for 6h. Purification by FC (elution: DCM/MeOH: 99/1 to 93/7). The final product required a trituration in refluxing EtOH. Isolated yield: 31%.

**Example 3.22: Synthesis of (4Z)-4-(1,3-benzothiazol-6-ylmethylene)-2-
5 [[(1R,2R)-2-hydroxycycloheptyl]amino]-1H-imidazol-5-one (63)**

Reaction was carried out according to GP3-B, in THF (0.3 M) on a 746 μ mol scale of (2.1), with 3 eq of (1R,2R)-2-aminocycloheptanol, at 110 °C (sealed tube, heating block) for 12h. Purification by FC (elution: DCM/MeOH: 99/1 to 93/7). The final product required a reprecipitation from DCM/pentane at 0 °C. Isolated yield: 49%.

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**Example 3.23: Synthesis of ($\pm$)-(4Z)-4-(1,3-benzothiazol-6-ylmethylene)-2-
15 [[cis-3-hydroxycycloheptyl]amino]-1H-imidazol-5-one (65)**

Reaction was carried out according to GP3-B, in THF (0.3 M) on a 218 μ mol scale of (2.2), with 3 eq of ($\pm$)-cis-3-aminocycloheptanol hydrochloride and 4 eq of DIPEA, at 150 °C (sealed tube, μ w) for 6h. Purification by FC (elution: DCM/MeOH: 99/1 to 93/7). Isolated yield: 46%.

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**Example 3.24: Synthesis of ($\pm$)-(4Z)-4-(1,3-benzothiazol-6-ylmethylene)-2-
20 [[trans-3-hydroxycycloheptyl]amino]-1H-imidazol-5-one (66)**

Reaction was carried out according to GP3-B, in THF (0.3 M) on a 272 μ mol scale of (2.2), with 3 eq of ($\pm$)-trans-3-aminocycloheptanol hydrochloride and 4 eq of DIPEA, at 120 °C (sealed tube, heating block) for 31h. Purification by FC (elution: DCM/MeOH: 99/1 to 93/7) then PTLC. Isolated yield: 67%.

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**Example 3.25: Synthesis of ($\pm$)-(4Z)-4-(1,3-benzothiazol-6-ylmethylene)-2-
25 [[trans-2-methoxycycloheptyl]amino]-1H-imidazol-5-one (68)**

Reaction was carried out according to GP3-B, in THF (0.3 M) on a 272 μ mol scale of (2.2), with 3 eq of ($\pm$)-trans-2-methoxycycloheptanamine, at 120 °C (sealed tube, heating block) for 24h. Purification by FC (elution: DCM/MeOH: 99/1 to 93/7). Isolated yield: 79%.

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Selected examples from sub-group A2:

Example 3.26: Synthesis of (4Z)-4-(1,3-benzothiazol-6-ylmethylene)-2-(benzylamino)-1H-imidazol-5-one (74)

Reaction was carried out according to GP3-A, in THF (0.3 M), on a 1.38 mmol scale of (2.1), with 4 eq of benzylamine at 110 °C (sealed tube, heating block) for 12h. The product directly precipitated in the reaction medium: it was isolated after filtration, washing with cold THF, then pentane. Isolated yield: 80%.

Example 3.27: Synthesis of (4Z)-4-(1,3-benzothiazol-6-ylmethylene)-2-[[2-(trifluoromethyl)phenyl]methylanino]-1H-imidazol-5-one (78)

Reaction was carried out according to GP3-A, in THF (0.3 M), on a 272 µmol scale of (2.2), with 3 eq of [2-(trifluoromethyl)phenyl]methanamine at 120 °C (sealed tube, heating block) for 24h. The product directly precipitated in the reaction medium: it was isolated after filtration, washing with cold THF. The final product required a trituration in refluxing EtOH. Isolated yield: 72%.

Example 3.28: Synthesis of (±)-(4Z)-4-(1,3-benzothiazol-6-ylmethylene)-2-[[trans-2-hydroxyindan-1-yl]amino]-1H-imidazol-5-one (81)

Reaction carried out according to GP3-A, in THF (0.3 M), on a 272 µmol scale of (2.2), with 3 eq of (±)-trans-1-aminoindan-2-ol at 120 °C (sealed tube, heating block) for 30h. The product directly precipitated in the reaction medium: it was isolated after filtration, washing with cold THF. The final product required a trituration in EtOH at r.t. Isolated yield: 56%.

Example 3.29: Synthesis of (4Z)-4-(1,3-benzothiazol-6-ylmethylene)-2-[[(1S,2S)-2-hydroxyindan-1-yl]amino]-1H-imidazol-5-one (83)

Reaction carried out according to GP3-A, in THF (0.3 M), on a 272 µmol scale of (2.2), with 3 eq of (1S,2S)-1-aminoindan-2-ol at 120 °C (sealed tube, heating block) for 40h. The product directly precipitated in the reaction medium: it was isolated after filtration, washing with cold THF. The final product required a trituration in EtOH at r.t. Isolated yield: 62%.

Example 3.30: Synthesis of (±)-(4Z)-2-[(2-amino-1-phenyl-ethyl)amino]-4-(1,3-benzothiazol-6-ylmethylene)-1H-imidazol-5-one dihydrochloride (89)

Reaction carried out according to GP3-B, in THF (0.3 M), on a 363 μmol scale of (2.2), with 3 eq of (±)-*tert*-butyl *N*-(2-amino-2-phenyl-ethyl)carbamate at 120 °C (sealed tube, heating block) for 48h. Purification by FC (elution: DCM/MeOH: 99/1 to 93/7) followed by deprotection with HCl (4M in dioxane). Isolated yield: 63%.

Example 3.31: Synthesis of (±)-(4Z)-4-(1,3-benzothiazol-6-ylmethylene)-2-[(2-hydroxy-1-phenyl-ethyl)amino]-1H-imidazol-5-one (95)

Reaction carried out according to GP3-B, in THF (0.3 M), on a 272 μmol scale of (2.2), with 3 eq of (±)-2-phenylglycinol at 150 °C (sealed tube, heating block) for 8h. Purification by FC (elution: DCM/MeOH: 99/1 to 93/7). The final product required a trituration in refluxing EtOH. Isolated yield: 37%.

Example 3.32: Synthesis of (±)-(4Z)-4-(1,3-benzothiazol-6-ylmethylene)-2-[(2-methoxy-1-phenyl-ethyl)amino]-1H-imidazol-5-one (98)

Reaction carried out according to GP3-B, in THF (0.3 M), on a 272 μmol scale of (2.2), with 3 eq of (±)-2-methoxy-1-phenyl-ethanamine at 120 °C (sealed tube, heating block) for 48h. Purification by FC (elution: DCM/MeOH: 99/1 to 93/7). The final product required a trituration in refluxing EtOH. Isolated yield: 41%.

Example 3.33: Synthesis of (±)-(4Z)-4-(1,3-benzothiazol-6-ylmethylene)-2-[(2-hydroxy-1-phenyl-ethyl)amino]-1H-imidazol-5-one (99)

Reaction carried out according to GP3-B, in THF (0.3 M), on a 272 μmol scale of (2.2), with 3 eq of (±)-2-amino-1-phenyl-ethanol hydrochloride and 4 eq of DIPEA, at 120 °C (sealed tube, heating block) for 2.5h. Purification by FC (elution: DCM/MeOH: 99/1 to 93/7). The final product required a trituration in refluxing EtOH. Isolated yield: 41%.

Example 3.34: Synthesis of (4Z)-4-(1,3-benzothiazol-6-ylmethylene)-2-[(1R)-2-methoxy-1-phenyl-ethyl]amino]-1H-imidazol-5-one (176)

Reaction carried out according to GP3-A, in THF (0.3 M), on a 12.71 mmol scale of (2.2), with 3 eq of (1*R*)-2-methoxy-1-phenyl-ethanamine at 140 °C (sealed tube, heating block) for 24h. The product directly precipitated in the reaction medium: it was isolated after filtration, washing with cold THF. The final product required a trituration in refluxing EtOH. Isolated yield: 51%.

Selected examples from sub-group A3:

Example 3.35: Synthesis of (4*Z*)-4-(1,3-benzothiazol-6-ylmethylene)-2-[(5-methylpyrazin-2-yl)methylamino]-1*H*-imidazol-5-one (103)

Reaction carried out according to GP3-B, in THF (0.3 M), on a 182 μmol scale of (2.2), with 3 eq of (5-methylpyrazin-2-yl)methanamine, at 80 °C (sealed tube, heating block) for 16h. Purification by FC (elution: DCM/MeOH: 99/1 to 93/7). Isolated yield: 47%.

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Example 3.36: Synthesis of (4*Z*)-4-(1,3-benzothiazol-6-ylmethylene)-2-[(4-methylthiazol-2-yl)methylamino]-1*H*-imidazol-5-one (108)

Reaction carried out according to GP3-B, in THF (0.3 M), on a 182 μmol scale of (2.2), with 3 eq of (4-methylthiazol-2-yl)methanamine, at 120 °C (sealed tube, heating block) for 24h. Purification by FC (elution: DCM/MeOH: 99/1 to 93/7). The final product required a trituration in refluxing EtOH. Isolated yield: 40%.

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Selected examples from sub-group A4:

Example 3.37: Synthesis of (4*Z*)-4-(1,3-benzothiazol-6-ylmethylene)-2-(tetrahydropyran-4-ylmethylamino)-1*H*-imidazol-5-one (113)

Reaction carried out according to GP3-B, in THF (0.3 M), on a 182 μmol scale of (2.2), with 3 eq of tetrahydropyran-4-ylmethanamine, at 120 °C (sealed tube, heating block) for 2h. Purification by FC (elution: DCM/MeOH: 99/1 to 93/7). Isolated yield: 51%.

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Selected examples from sub-group A5:

Example 3.38: Synthesis of (4Z)-4-(1,3-benzothiazol-6-ylmethylene)-2-[4-(4-methylpiperazin-1-yl)anilino]-1H-imidazol-5-one (119)

Reaction carried out according to GP3-A, in THF (0.3 M), on a 182 μ mol scale of (2.1), with 5 eq of 4-(4-methylpiperazin-1-yl)aniline, at 150 °C (sealed tube, μ w) for 3h.
5 The product directly precipitated in the reaction medium: it was isolated after filtration. The final product required two successive triturations in refluxing EtOH. Isolated yield: 65%.

Example 3.39: Synthesis of (4Z)-4-(1,3-benzothiazol-6-ylmethylene)-2-[(1-methylindazol-7-yl)amino]-1H-imidazol-5-one (125)

Reaction carried out according to GP3-A, in THF (0.3 M), on a 182 μ mol scale of (2.2), with 5 eq of 1-methylindazol-7-amine and 15 eq AcOH, at 130 °C (sealed tube, heating block) for 5h. The product directly precipitated in the reaction medium: it was isolated after filtration. The final product required a trituration in EtOH at r.t. Isolated
15 yield: 52%.

Selected examples from sub-group A6:

Example 3.40: Synthesis of (4Z)-4-(1,3-benzothiazol-6-ylmethylene)-2-(2-pyridylamino)-1H-imidazol-5-one (127)

Reaction carried out according to GP3-A, in THF (0.3 M), on a 1.05 mmol scale of (2.2), with 5 eq of pyridine-2-amine and 15 eq AcOH, at 150 °C (sealed tube, μ w) for 2h. The product directly precipitated in the reaction medium: it was isolated after filtration. The final product required a trituration in refluxing EtOH. Isolated yield: 41%.

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Example 3.41: Synthesis of (4Z)-4-(1,3-benzothiazol-6-ylmethylene)-2-[(1-methylpyrazol-3-yl)amino]-1H-imidazol-5-one (128)

Reaction carried out according to GP3-A, in THF (0.3 M), on a 182 μ mol scale of (2.2), with 5 eq of 1-methylpyrazol-3-amine, at 150 °C (sealed tube, μ w) for 3h. The
30 product directly precipitated in the reaction medium: it was isolated after filtration. The final product required a trituration in EtOH at r.t. Isolated yield: 71%.

Selected examples from sub-group A7:**Example 3.42: Synthesis of (4Z)-4-(1,3-benzothiazol-6-ylmethylene)-2-[[*(3S)*-tetrahydrofuran-3-yl]amino]-1*H*-imidazol-5-one (146)**

5 Reaction carried out according to GP3-B, in THF (0.3 M), on a 746 μ mol scale of (2.2), with 3 eq of (*3S*)-tetrahydrofuran-3-amine, at 120 °C (sealed tube, heating block) for 12h. The product directly precipitated in the reaction medium: it was isolated after filtration. Purification by FC (elution: DCM/MeOH: 99/1 to 93/7). The final product required a reprecipitation from DCM/pentane at 0 °C. Isolated yield: 51%.

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Example 3.43: Synthesis of (4Z)-4-(1,3-benzothiazol-6-ylmethylene)-2-[[*(3R)*-tetrahydropyran-3-yl]amino]-1*H*-imidazol-5-one (147)

 Reaction carried out according to GP3-B, in THF (0.3 M), on a 1.04 mmol scale of (2.1), with 4 eq of (*3R*)-tetrahydropyran-3-amine hydrochloride and 6 eq of TEA, 15 at 110 °C (sealed tube, heating block) for 12h. Purification by FC (elution: DCM/MeOH: 99/1 to 93/7). The final product required a reprecipitation from DCM/pentane at 0 °C. Isolated yield: 60%.

Example 3.44: Synthesis of (4Z)-4-(1,3-benzothiazol-6-ylmethylene)-2-[[*(3S)*-tetrahydropyran-3-yl]amino]-1*H*-imidazol-5-one (148)

20 Reaction carried out according to GP3-B, in THF (0.3 M), on a 746 μ mol scale of (2.2), with 3 eq of (*3S*)-tetrahydropyran-3-amine hydrochloride and 4 eq of DIPEA, at 130 °C (sealed tube, heating block) for 12h. Purification by FC (elution: DCM/MeOH: 99/1 to 93/7). The final product required a reprecipitation from DCM/pentane at 0 °C. 25 Isolated yield: 62%.

Example 3.45: Synthesis of (4Z)-4-(1,3-benzothiazol-6-ylmethylene)-2-[[*(3R,4R)*-4-hydroxytetrahydropyran-3-yl]amino]-1*H*-imidazol-5-one (150)

 Reaction carried out according to GP3-B, in THF (0.3 M), on a 746 μ mol scale 30 of (2.2), with 3 eq of (*3R,4R*)-3-aminotetrahydropyran-4-ol, at 130 °C (sealed tube, heating block) for 12h. Purification by FC (elution: DCM/MeOH: 99/1 to 93/7). The final product required a reprecipitation from DCM/pentane at 0 °C. Isolated yield: 35%.

Example 3.46: Synthesis of (±)-(4Z)-4-(1,3-benzothiazol-6-ylmethylene)-2-(oxepan-3-ylamino)-1H-imidazol-5-one (151)

Reaction carried out according to GP3-B, in THF (0.3 M), on a 272 µmol scale of (2.2), with 1.2 eq of (±)-oxepan-3-amine, at 130 °C (sealed tube, heating block) for 12h. Purification by FC (elution: DCM/MeOH: 99/1 to 93/7). Isolated yield: 33%.

Example 4: Biological activity

10 **MATERIAL AND METHODS**

PROTEIN KINASE ASSAYS

1. Overview

Assays were performed by ProQinase GmbH (Engesserstr. 4, D-79108 Freiburg, Germany. www.proqinase.com) (Now Reaction Biology; <https://www.reactionbiology.com/>). The IC₅₀ profile of all compounds was determined using 12 protein kinases (CDK5/p25, CK1ε, CLK1, 2, 3, 4, DYRK1A, 1B, 2, 3, 4, GSK3β). IC₅₀ values were measured by testing 10 concentrations (10 µM to 30 nM) of each compound in singlicate.

20 **2. Test Compounds**

The compounds were provided as 1 µM stock solutions in 100% DMSO. Prior to testing, the 1 µM stock solutions were subjected to a serial, semi-logarithmic dilution using 100 % DMSO as a solvent. This resulted in 10 distinct concentrations, with a dilution endpoint of 3 x 10 nM/100 % DMSO, with 100 % DMSO as controls. In the process, 90 µL H₂O were added to each well of each compound dilution plate. To minimize potential precipitation, the H₂O was added to each plate only a few minutes before the transfer of the compound solutions into the assay plates. The plate was shaken thoroughly, resulting in a compound dilution plate/ 10 % DMSO.

For the assays (see below), 5 µL solution from each well of the compound dilution plates/10 % DMSO were transferred into the assay plates. The final volume of the assay was 50 µL. All compounds were tested at 10 final assay concentrations in the range from

10 μM to 30 nM. The final DMSO concentration in the reaction cocktails was 1 % in all cases.

3. Recombinant Protein Kinases

5 All protein kinases provided by ProQinase were expressed in Sf9 insect cells or in *E. coli* as recombinant GST-fusion proteins or His-tagged proteins, either as full-length or enzymatically active fragments. All kinases were produced from human cDNAs and purified by either GSH-affinity chromatography or immobilized metal. Affinity tags were removed from a number of kinases during purification. The purity of the protein kinases
10 was examined by SDS-PAGE/Coomassie staining, the identity was checked by mass spectroscopy.

4. Protein Kinase Assay

A radiometric protein kinase assay (33PanQinase® Activity Assay) was used for
15 measuring the kinase activity of the 12 protein kinases. All kinase assays were performed in 96-well FlashPlates™ from PerkinElmer (Boston, MA, USA) in a 50 μL reaction volume. The reaction cocktail was pipetted in four steps in the following order:

- 25 μL of assay buffer (standard buffer/[γ - ^{33}P]-ATP),
- 10 μL of ATP solution (in H_2O),
- 20 • 5 μL of test compound (in 10 % DMSO),
- 10 μL of enzyme/substrate mixture.

The assay for all protein kinases contained 70 mM HEPES-NaOH pH 7.5, 3 mM MgCl_2 , 3 mM MnCl_2 , 3 μM Na-orthovanadate, 1.2 mM DTT, 50 $\mu\text{g}/\text{ml}$ PEG20000, ATP (variable concentrations, corresponding to the apparent ATP- K_m of the respective kinase),
25 [γ - ^{33}P]-ATP (approx. 6.5×10^{-5} cpm per well), protein kinase (variable amounts), and substrate (variable amounts). The reaction cocktails were incubated at 30°C for 60 minutes. The reaction was stopped with 50 μL of 2% (v/v) H_3PO_4 , plates were aspirated and washed two times with 200 μL 0.9% (w/v) NaCl. Incorporation of ^{33}Pi was determined with a microplate scintillation counter (Microbeta, Wallac). The IC_{50} values for all compounds
30 were calculated from the dose response curves

5. Quality controls

As a parameter for assay quality, the Z'-factor (Zhang et al., J. Biomol. Screen. 2: 67-73, 1999) for the low and high controls of each assay plate (n = 8) was used. ProQinase's criterion for repetition of an assay plate is a Z'-factor below 0.4 (Iversen et al., J. Biomol. Screen. 3: 247-252, 2006).

5 Their activity has been classified according to two criteria, kinase inhibition potency and kinase selectivity.

 The **kinase inhibition potency classification** was done according to the following ranges of IC₅₀ values:

 Some compounds have an IC₅₀ activity varying from above 0.050 µM. These
10 compounds correspond to the above-reported class **E**. Some compounds have an IC₅₀
activity varying from 0.025 to 0.050 µM. These compounds correspond to the above-
reported class **D**. Some compounds of the invention have an IC₅₀ activity varying from
0.010 to 0.025 µM. These compounds correspond to the above-reported class **C**. Further
some particular compounds have an IC₅₀ activity varying from 0.005 to 0.010 µM. These
15 compounds correspond to the above-reported class **B**. Even preferred are compounds of the
invention that have an IC₅₀ activity of less than 0.005 µM. These compounds correspond to
the above-reported class **A**. This classification was applied to CLK1 and DYRK1A. Said
letters A to E were used to quote the activity/efficacy of the compounds of the invention in
the following Table 4, 4A and 4B.

20 The **kinase selectivity classification** was based on comparing the IC₅₀ values of
DYRK1A with that of CLK1 or with that of DYRK1B. The classification was done
according to the following ranges of values: **I**: ratio of IC₅₀ on CLK1 or DYRK1B over
IC₅₀ on DYRK1A $\geq$ 10 fold (most DYRK1A-selective compounds); **II**: ratio between 2
and 10 fold; **III**: ratio between 0.5 and 2 fold; **IV**: ratio between 0.1 and 0.5 fold; **V**: ratio >
25 0.1 fold (most CLK1- or DYRK1B-selective compounds). Said numbers I to V were used
to quote the relative selectivity of the compounds of the invention in the following Tables.

Table 4. Kinase inhibitory activities of compounds (1) to (216), tested on 12 kinases. IC₅₀ values were calculated from dose-response curves. Compounds were further classified in terms of efficacy on CLK1 or DYRK1A (decreasing efficacy range: A to E) and in terms of relative selectivity (decreasing selectivity range: I to V).

Cpd N°	Potency Class CLK1	Potency Class DYRK1A	Selectivity Class DYRK1A vs. CLK1	Selectivity Class DYRK1B vs. DYRK1A
1	D	E	IV	III
2	E	E	IV	III
3	E	E	IV	III
4	D	E	III	III
5	D	E	IV	III
6	C	D	IV	III
7	C	D	IV	III
8	C	C	III	III
9	B	B	III	III
10	C	E	V	IV
11	E	E	IV	III
12	C	C	III	II
13	D	E	IV	II
14	C	C	III	II
15	E	E	III	II
16	B	A	II	III
17	C	B	II	II
18	E	E	II	III
19	A	A	II	II
20	B	A	I	II
21	B	A	II	II

Cpd N°	Potency Class CLK1	Potency Class DYRK1A	Selectivity Class DYRK1A vs. CLK1	Selectivity Class DYRK1B vs. DYRK1A
22	C	A	I	II
23	C	E	IV	IV
24	D	C	III	III
25	C	A	II	II
26	C	E	V	V
27	C	A	II	II
28	C	D	IV	I
29	E	E	II	II
30	D	E	III	III
31	C	D	IV	III
32	D	C	III	III
33	C	E	V	IV
34	C	A	II	III
35	B	A	II	II
36	D	C	II	II
37	E	E	IV	II
38	D	D	III	III
39	E	E	III	III
40	C	B	II	II
41	D	D	III	III
42	E	E	III	I

Cpd N°	Potency Class CLK1	Potency Class DYRK1A	Selectivity Class DYRK1A vs. CLK1	Selectivity Class DYRK1A vs. DYRK1B
43	C	C	III	II
44	C	C	III	II
45	E	E	III	II
46	C	D	IV	II
47	E	E	III	III
48	B	A	III	II
49	D	D	III	II
50	E	E	III	II
51	C	C	III	II
52	E	E	III	II
53	D	D	III	II
54	E	E	III	II
55	C	C	III	II
56	D	C	III	II
57	D	C	III	III
58	E	E	IV	II
59	C	C	III	II
60	E	E	III	II
61	B	A	II	II
62	C	C	III	IV
63	C	C	III	II
64	D	C	III	III
65	C	A	II	III
66	C	A	II	II
67	C	D	IV	III
68	C	C	III	II
69	C	D	IV	II

Cpd N°	Potency Class CLK1	Potency Class DYRK1A	Selectivity Class DYRK1A vs. CLK1	Selectivity Class DYRK1A vs. DYRK1B
70	C	E	IV	III
71	C	E	IV	II
72	E	E	III	III
73	B	E	IV	III
74	C	D	IV	III
75	E	E	IV	II
76	C	E	IV	II
77	C	D	IV	II
78	B	B	III	II
79	D	E	V	III
80	D	D	III	II
81	B	A	II	III
82	D	E	V	IV
83	C	B	II	IV
84	E	E	III	II
85	C	C	III	II
86	D	D	III	II
87	E	E	III	II
88	C	E	IV	IV
89	C	B	II	II
90	D	D	III	II
91	E	E	IV	III
92	C	D	III	III
93	D	D	III	II
94	D	E	IV	III
95	B	A	II	II
96	B	A	II	II

Cpd N°	Potency Class CLK1	Potency Class DYRK1A	Selectivity Class DYRK1A vs. CLK1	Selectivity Class DYRK1A vs. DYRK1B
97	C	B	II	II
98	C	C	III	II
99	C	B	III	II
100	C	E	IV	IV
101	C	E	IV	III
102	C	E	V	III
103	E	E	IV	III
104	C	E	IV	III
105	C	E	V	III
106	C	E	IV	III
107	E	E	IV	III
108	C	D	III	III
109	D	E	IV	III
110	E	E	III	III
111	E	E	IV	II
112	E	E	IV	III
113	D	E	IV	III
114	E	E	-	III
115	E	E	V	IV
116	E	E	III	I
117	D	E	IV	III
118	E	E	-	-
119	C	C	III	III
120	E	E	IV	I
121	E	E	III	II
122	E	E	IV	II
123	E	E	V	IV

Cpd N°	Potency Class CLK1	Potency Class DYRK1A	Selectivity Class DYRK1A vs. CLK1	Selectivity Class DYRK1A vs. DYRK1B
124	E	E	-	-
125	E	D	II	III
126	E	E	IV	III
127	C	E	IV	
128	D	E	III	III
129	E	E	IV	II
130	C	E	IV	III
131	C	E	IV	III
132	E	E	IV	III
133	n.t.	n.t.	n.t.	n.t.
134	n.t.	n.t.	n.t.	n.t.
135	D	E	III	IV
136	E	E	III	II
137	E	E	IV	III
138	n.t.	n.t.	n.t.	n.t.
139	C	E	IV	III
140	E	E	IV	III
141	D	E	IV	II
142	E	E	IV	III
143	E	E	IV	III
144	E	E	IV	II
145	E	E	IV	III
146	D	D	III	II
147	D	E	III	III
148	D	C	II	I
149	D	C	III	II
150	D	D	III	II

Cpd N°	Potency Class CLK1	Potency Class DYRK1A	Selectivity Class DYRK1A vs. CLK1	Selectivity Class DYRK1A vs. DYRK1B
151	C	C	III	III
152	E	E	IV	II
153	E	E	IV	II
154	E	E	III	II
149A	D	D	III	II
149B	D	D	III	III
155	B	C	III	III
156	C	E	III	III
157	C	C	III	III
158	C	B	III	II
159	B	A	II	II
160	B	A	II	II
161	B	D	IV	III
162	D	B	II	III
163	D	E	III	II
164	C	C	III	II
165	C	C	III	III
166	D	E	III	II
167	C	C	III	II
168	C	C	III	I
169	B	B	III	I
169A	B	C	III	II
169B	C	C	III	II
170	C	C	III	I
171	C	C	III	I
171A	B	C	III	III
171B	C	C	III	III

Cpd N°	Potency Class CLK1	Potency Class DYRK1A	Selectivity Class DYRK1A vs. CLK1	Selectivity Class DYRK1A vs. DYRK1B
172	C	B	II	I
173	C	B	III	I
174	D	C	II	I
175	D	B	II	I
176	B	A	III	II
177	E	E	IV	II
178	C	C	III	I
179	C	C	III	III
180	C	C	III	III
181	D	C	III	II
182	C	D	III	II
183	D	E	III	II
184	B	A	II	II
185	C	C	III	I
186	E	E	IV	II
187	E	E	IV	II
188	E	E	III	II
189	E	E	III	II
190	E	E	III	I
191	C	D	III	I
192	C	C	III	II
192A	C	D	IV	II
192B	C	E	II	II
193	E	E	III	III
194	C	A	I	III
195	C	B	III	III
196	B	A	I	III

Cpd N°	Potency Class CLK1	Potency Class DYRK1A	Selectivity Class DYRK1A vs. CLK1	Selectivity Class DYRK1A vs. DYRK1B
197	E	E	III	II
198	C	D	II	II
199	B	A	II	II
200	B	A	II	II
201	B	A	II	III
202	B	A	II	III
203	B	A	II	III
204	E	C	I	III
205	E	E	II	II
206	E	E	III	III
207	E	C	II	II
208	E	D	III	II
209	E	C	II	II
210	B	A	II	II
211	n.t.	n.t.	n.t.	n.t.
212	n.t.	n.t.	n.t.	n.t.
214	n.t.	n.t.	n.t.	n.t.
215	n.t.	n.t.	n.t.	n.t.
216	n.t.	n.t.	n.t.	n.t.

Table 4A. Most potent CLK1 inhibitors ($IC_{50} \leq 10$ nM). Kinase inhibition potency classes: IC_{50} values: **A** ≤ 0.005 μ M; **B** ≤ 0.010 μ M; **C** ≤ 0.025 μ M; **D** ≤ 0.050 μ M; **E** > 0.050 μ M. Kinase selectivity classes based on DYRK1A: class **I** (>10 fold selectivity), class **II** (2-10 fold selectivity), class **III** (0.5-2 fold selectivity = equipotency). Some compounds display a better selectivity for CLK1 or DYRK1B compared to DYRK1A. These compounds correspond to the above-reported class **IV** (2-10-fold selectivity) or class **V** (>10 -fold selectivity).

Cpd N°	Potency Class CLK1	Potency Class DYRK1A	Selectivity Class DYRK1A vs. CLK1
19	A	A	II
73	B	E	IV
78	B	B	III
20	B	A	I
21	B	A	II
61	B	A	II
95	B	A	II
16	B	A	II
35	B	A	II
48	B	A	III
81	B	A	II
96	B	A	II
9	B	B	III
155	B	C	III
159	B	A	II
160	B	A	II
161	B	D	IV
169	B	B	III
169A	B	C	III
171A	B	C	III
176	B	A	III
184	B	A	II
196	B	A	I
199	B	A	II
200	B	A	II
201	B	A	II
202	B	A	II
203	B	A	II
210	B	A	II

10 The most potent CLK2 inhibitors, with an IC_{50} lower or equal to 10 nM are compounds (9), (16), (20), (21), (22), (24), (25), (81), (83), (89), (95), (96), (159), (181), (194), (196), (199), (200), (201), (202) and (203).

The most potent CLK3 inhibitors, with an IC₅₀ lower or equal to 100 nM are compounds (48), (89) (90), (159), (164), (165), (169), (169B), (178) and (181).

- 5 The most potent CLK4 inhibitors, with an IC₅₀ lower or equal to 10 nM are compounds (7), (8), (9), (10), (12), (16), (17), (19), (20), (21), (23), (25), (26), (28), (32), (33), (34), (35), (40), (41), (43), (44), (46), (48), (51), (55), (56), (57), (59), (61), (62), (63), (65), (66), (67), (68), (69), (70), (73), (77), (78), (81), (83), (88), (89), (90), (95), (96), (97), (98), (99), (100), (101), (102), (104), (105), (106), (117), (119), (127), (131), (139), (148), (149),
10 (149B), (151), (155), (156), (157), (158), (159), (160), (161), (164), (165), (167), (169), (169A), (169B), (170), (171), (171A), (171B), (172), (173), (176), (178), (179), (180), (181), (184), (185), (191), (192), (192A), (194), (196), (198), (199), (200), (201), (202), (203) and (210).

15

Table 4B. Most potent DYRK1A inhibitors (IC₅₀ ≤ 10 nM). Kinase Inhibition Efficacy Classes and Kinase Selectivity Classes as described in Table 4A.

Cpd N°	Potency Class CLK1	Potency Class DYRK1A	Selectivity Class DYRK1A vs. CLK1	Selectivity Class DYRK1A vs. DYRK1B
20	B	A	I	II
16	B	A	II	III
19	A	A	II	II
27	C	A	II	II
21	B	A	II	II
22	C	A	I	II
81	B	A	II	III
61	B	A	II	II
35	B	A	II	II
95	B	A	II	II
96	B	A	II	II
65	C	A	II	II
66	C	A	II	II
34	C	A	II	III
25	C	A	II	II
48	B	A	III	II
159	B	A	II	II
160	B	A	II	II
176	B	A	III	II
184	B	A	II	II
196	B	A	I	III

Cpd N°	Potency Class CLK1	Potency Class DYRK1A	Selectivity Class DYRK1A vs. CLK1	Selectivity Class DYRK1A vs. DYRK1B
194	C	A	I	III
199	B	A	II	II
200	B	A	II	II
201	B	A	II	II
202	B	A	II	III
203	B	A	II	II
210	B	A	II	II
83	C	B	II	IV
40	C	B	II	II
9	B	B	III	III
89	C	B	II	II
17	C	B	II	II
78	B	B	III	II
97	C	B	II	II
99	C	B	III	II
169	B	B	III	I
158	C	B	III	II
172	C	B	II	I
173	C	B	III	I
195	C	B	III	III
162	D	B	II	III
175	D	B	II	I

The most potent DYRK1B inhibitors, with an IC₅₀ lower or equal to 10 nM are compounds (20), (16), (83), (81), (34), (95), (21), (22), (27), (35), (61), (9), (96), (159), (160), (162), (176), (194), (196), (199), (200), (201), (202), (203) and (210).

5

The most potent DYRK2 inhibitors, with an IC₅₀ lower or equal to 100 nM are compounds (16), (20), (21), (48), (89), (90), (99), (119), (158), (159), (169), (179), (194), (196), (199), (200), (201), (203) and (210).

- 10 The most potent DYRK3 inhibitors, with an IC₅₀ lower or equal to 100 nM are compounds (16), (20), (21), (89), (90), (119), (162), (159), (181), (194), (196), (199), (200), (201) and (203).

- 15 The most potent DYRK4 inhibitors, with an IC₅₀ lower or equal to 100 nM are compounds (20) and (48), (164), (194) and (196).

Table 4C. Most DYRK1A selective inhibitors compared to CLK1. Kinase Selectivity
Classes as described in Table 4A.

Cpd N°	Selectivity Class DYRK1A vs. CLK1	Cpd N°	Selectivity Class DYRK1A vs. CLK1
20	I	66	II
22	I	83	II
194	I	18	II
196	I	29	II
204	I	125	II
16	II	36	II
17	II	159	II
21	II	160	II
61	II	162	II
27	II	172	II
35	II	174	II
95	II	175	II
96	II	184	II
97	II	192B	II
89	II	199	II
19	II	200	II
81	II	201	II
148	II	202	II
65	II	203	II
34	II	205	II
40	II	209	II
25	II	210	II

Table 4D. Most CLK1 selective inhibitors compared to DYRK1A. Kinase Selectivity
5 Classes as described in Table 4A.

Cpd N°	Selectivity Class DYRK1A vs. CLK1
79	V
115	V
123	V
82	V
10	V
33	V
102	V
26	V
105	V

Table 4E. Most DYRK1A selective inhibitors compared to DYRK1B. Kinase
Selectivity Classes as described in Table 4A.

Cpd N°	Selectivity Class DYRK1A vs. DYRK1B	Cpd N°	Selectivity Class DYRK1A vs. DYRK1B
28	I	45	II
120	I	12	II
116	I	56	II
42	I	149	II
148	I	50	II
168	I	150	II
169	I	121	II
170	I	55	II
171	I	146	II
172	I	44	II
173	I	93	II
174	I	51	II
175	I	52	II
178	I	53	II
185	I	54	II
190	I	57	II
191	I	78	II
76	II	64	II
111	II	60	II
75	II	154	II
122	II	14	II
46	II	87	II
71	II	84	II
67	II	17	II
129	II	61	II
144	II	27	II
141	II	35	II
37	II	95	II
153	II	96	II
13	II	97	II
152	II	89	II
77	II	19	II
15	II	65	II
136	II	40	II
48	II	25	II
85	II	66	II
49	II	29	II
62	II	36	II
59	II	20	II
90	II	21	II
43	II	22	II
99	II	149A	II
63	II	158	II
80	II	159	II
98	II	160	II
86	II	163	II

Cpd N°	Selectivity Class DYRK1A vs. DYRK1B	Cpd N°	Selectivity Class DYRK1A vs. DYRK1B
164	II	189	II
166	II	192	II
167	II	192A	II
169A	II	192B	II
169B	II	197	II
176	II	198	II
177	II	199	II
181	II	200	II
182	II	205	II
183	II	207	II
184	II	208	II
186	II	209	II
187	II	210	II
188	II		

Table 4F. Most DYRK1B selective inhibitors compared to DYRK1A. Kinase Selectivity Classes as described in Table 4A.

Cpd N°	Selectivity Class DYRK1A vs. DYRK1B
26	V
115	IV
123	IV
82	IV
10	IV
33	IV
88	IV
23	IV
100	IV
135	IV
83	IV

5

RESULTS

Most compounds of the present invention present an IC₅₀ activity of less than 2 μ M on CLKs or DYRKs. All the compounds were inhibitors of DYRK1A and CLK1 (Table 4).

10 Compounds were preferably inhibitory on CLK1 (Table 4A), CLK4, DYRK1A (Table 4B) and DYRK1B.

Some are most selective for DYRK1A vs. CLK1 (Table 4C), DYRK1A vs. DYRK1B (Table 4E), DYRK1B vs. DYRK1A (Table 4F) or CLK1 vs. DYRK1A (Table 4D). Some compounds display a better selectivity for DYRK1A compared to CLK1 or DYRK1B. These compounds correspond to the above-reported class **I** (>10-fold selectivity) or class **II** (2 to 10-fold selectivity). Some compounds are equipotent. These compounds correspond to the above-reported class **III** (0.5 to 2-fold selectivity). Some compounds display a better selectivity for CLK1 or DYRK1B compared to DYRK1A. These compounds correspond to the above-reported class **IV** (2 to 10-fold selectivity) or class **V** (>10-fold selectivity).

10

CONCLUSION

Based on the previous results, it can be concluded that the compounds of formula (I) are suitable chemical compounds in the prevention and/or treatment of cognitive deficits associated with Down syndrome (Trisomy 21); Alzheimer's disease and related diseases; dementia; tauopathies; other neurodegenerative diseases (Parkinson's disease; Pick disease, including Niemann-Pick Type C Disease); CDKL5 Deficiency Disorder; type 1 and type 2 diabetes; abnormal folate and methionine metabolism; osteoarthritis, in particular knee osteoarthritis; Duchenne muscular dystrophy; several cancers, such as brain cancer, including glioblastoma, leukemia, including megakaryoblastic leukemia and acute lymphoblastic leukemia, head and neck squamous cell carcinoma, pancreatic cancer, including pancreatic ductal adenocarcinoma, prostate cancer, gastrointestinal cancer and breast cancer, such as Triple-negative breast cancer (TNBC), malaria, Leishmaniasis, Chagas and sleeping sickness (*Trypanosoma* sp.), and cattle diseases due to unicellular pathogens, viral infections, such as caused by Human immunodeficiency virus type 1 (HIV-1), Human cytomegalovirus (HCMV), Influenza A, Herpes virus, rhesus macaque cytomegalovirus, varicella-zoster virus and herpes simplex virus (HSV) and in the regulation of body temperature.

It may further be concluded that some compounds of formula (I) are further suitable for treating and/or preventing Phelan-McDermid syndrome; autism; further viral infections, such as caused by Hepatitis C virus, Chikungunya virus, Dengue virus, Influenza virus and Severe acute respiratory syndrome (SARS) coronavirus, Cytomegalovirus and Human papillomavirus; further cancers, such as tissue cancer,

30

including liposarcoma, Hedgehog/GLI-dependent cancer, liver cancer, including Hepatocellular carcinoma, neuroinflammation, anemia, infections caused by unicellular parasites, such as malaria, Leishmaniasis, Chagas and sleeping sickness (*Trypanosoma* sp.), and cattle diseases due to unicellular pathogens.

5 Leucettinibs display much increased efficacy (down to sub-micromolar and single-digit micromolar IC₅₀ values) compared to reference compounds. They also display a large range of selectivity towards DYRK1A or CLK1. And some products being equipotent on CLKs and DYRKs may also find applications as dual-specificity inhibitors.

10 The present invention further relates to a pharmaceutical composition comprising at least one compound of formula (I) as defined above or any of its pharmaceutically acceptable salts or at least any of compounds (1) to (216) as defined above or any of its pharmaceutically acceptable salts and also at least one pharmaceutically acceptable excipient.

15 Pharmaceutical compositions of the invention can contain one or more compound(s) of the invention in any form described herein.

 Still a further object of the present invention consists of the use of at least one compound of formula (I) as defined above, and compounds (1) to (216) as defined above, or one of their pharmaceutically acceptable salts according to the present invention for
20 preparing a drug for preventing and/or treating a disease selected from cognitive deficits associated with Down syndrome (Trisomy 21); Alzheimer's disease and related diseases; dementia; tauopathies; and other neurodegenerative diseases (Parkinson's disease; Pick disease, including Niemann-Pick Type C Disease); CDKL5 Deficiency Disorder; McDermid syndrome; autism; type 1 and type 2 diabetes; regulation of folate and
25 methionine metabolism; osteoarthritis, in particular knee osteoarthritis; Duchenne muscular dystrophy; several cancers, such as brain cancer, including glioblastoma, leukemia, including megakaryoblastic leukemia, head and neck squamous cell carcinoma, pancreatic cancer, including pancreatic ductal adenocarcinoma, prostate cancer, gastrointestinal cancer, breast cancer, such as Triple-negative breast cancer (TNBC),
30 tissue cancer, including liposarcoma, Hedgehog/GLI-dependent cancer, liver cancer, including Hepatocellular carcinoma and viral infections, such as caused by Human immunodeficiency virus type 1 (HIV-1), Human cytomegalovirus (HCMV), Influenza A,

Herpes virus, rhesus macaque cytomegalovirus, varicella-zoster virus, herpes simplex virus (HSV), Hepatitis C virus, Chikungunya virus, Dengue virus, Influenza virus and Severe acute respiratory syndrome (SARS) coronavirus, Cytomegalovirus and Human papillomavirus; neuroinflammation; anemia; infections caused by unicellular parasites, such malaria, Leishmaniasis, Chagas and sleeping sickness (*Trypanosoma* sp.), and cattle diseases due to unicellular pathogens, and for regulating body temperature.

Still a further object of the present invention consists of the use of at least one compound of formula (I) as defined above, and compounds (1) to (216) as defined above, or one of their pharmaceutically acceptable salts according to the present invention for preparing a drug for preventing and/or treating a disease selected from cognitive deficits associated with Down syndrome (Trisomy 21); Alzheimer's disease and related diseases; dementia; tauopathies; other neurodegenerative diseases (Parkinson's disease; Pick disease, including Niemann-Pick Type C Disease); CDKL5 Deficiency Disorder; type 1 and type 2 diabetes; regulation of folate and methionine metabolism; osteoarthritis, in particular knee osteoarthritis; Duchenne muscular dystrophy; several cancers, such as brain cancer, including glioblastoma, leukemia, including megakaryoblastic leukemia, head and neck squamous cell carcinoma, pancreatic cancer, including pancreatic ductal adenocarcinoma, prostate cancer, gastrointestinal cancer and breast cancer, such as Triple-negative breast cancer (TNBC), infections caused by unicellular parasites, such malaria, Leishmaniasis, Chagas and sleeping sickness (*Trypanosoma* sp.), and cattle diseases due to unicellular pathogens, and viral infections, such as caused by Human immunodeficiency virus type 1 (HIV-1), Human cytomegalovirus (HCMV), Influenza A, Herpes virus, rhesus macaque cytomegalovirus, varicella-zoster virus and herpes simplex virus (HSV) and for regulating body temperature.

Still a further object of the present invention consists of the use of at least one compound of formula (I), as defined above, and compounds (1) to (216) as defined above, or one of their pharmaceutically acceptable salts according to the present invention for preparing a drug for combatting a disease selected from type 1 and type 2 diabetes, viral infections, in particular as mentioned above, osteoarthritis, cancers, in particular as mentioned above, infections caused by unicellular parasites, such malaria, Leishmaniasis, Chagas and sleeping sickness (*Trypanosoma* sp.), and cattle diseases due to unicellular pathogens, and to regulate body temperature.

According to a particular embodiment, the treatment is continuous or non-continuous.

A “continuous treatment” means a long-term treatment which can be implemented with various administration frequencies, such as once every day, every three
5 days, once a week, or once every two weeks or once every month or by transdermal patch delivery.

According to one embodiment, the compound of formula (I), or any of its pharmaceutically acceptable salts, is administered at a dose varying from 0.1 to 1000 mg, in particular varying from 1 to 500 mg, or for example varying from 5 to 100 mg.

10 Another object of the invention relates to a therapeutic method for the treatment and/or for the prevention of a disease selected from cognitive deficits associated with Down syndrome (Trisomy 21); Alzheimer’s disease and related diseases; dementia; tauopathies; and other neurodegenerative diseases (Parkinson’s disease; Pick disease, including Niemann-Pick Type C Disease); CDKL5 Deficiency Disorder; McDermid
15 syndrome; autism; type 1 and type 2 diabetes; regulation of folate and methionine metabolism; osteoarthritis, in particular knee osteoarthritis; Duchenne muscular dystrophy; several cancers, such as brain cancer, including glioblastoma, leukemia, including megakaryoblastic leukemia, head and neck squamous cell carcinoma, pancreatic cancer, including pancreatic ductal adenocarcinoma, prostate cancer, gastrointestinal cancer,
20 breast cancer, such as Triple-negative breast cancer (TNBC), tissue cancer, including liposarcoma, Hedgehog/GLI-dependent cancer, liver cancer, including Hepatocellular carcinoma and viral infections, such as caused by Human immunodeficiency virus type 1 (HIV-1), Human cytomegalovirus (HCMV), Influenza A, Herpes virus, rhesus macaque cytomegalovirus, varicella-zoster virus, herpes simplex virus (HSV), Hepatitis C virus,
25 Chikungunya virus, Dengue virus, Influenza virus and Severe acute respiratory syndrome (SARS) coronavirus, Cytomegalovirus and Human papillomavirus; neuroinflammation; anemia; infections caused by unicellular parasites, such malaria, Leishmaniasis, Chagas and sleeping sickness (*Trypanosoma* sp.), and cattle diseases due to unicellular pathogens, and for the regulation of the body temperature, in a patient in need thereof, comprising at least a
30 step of administering a therapeutically effective amount of a compound of formula (I) or of compounds (1) to (216), as defined above. or one of their acceptable salts.

In a specific embodiment, the invention provides a use of a compound of formula (I) according to the invention or a pharmaceutically acceptable salt thereof or a pharmaceutically active derivative thereof or a method according to the invention wherein the compound of formula (I) is to be administered in combination with a co-agent useful in
5 anyone of the hereabove mentioned diseases.

The compounds can be administered through any mode of administration such as, for example, intramuscular, intravenous, intranasal or oral route, transdermal patch, etc.

The inventive composition can further include one or more additives such as diluents, excipients, stabilizers and preservatives. Such additives are well known to those
10 skilled in the art and are described notably in “*Ullmann's Encyclopedia of Industrial Chemistry*, 6th Ed.” (various editors, 1989-1998, Marcel Dekker) and in “*Pharmaceutical Dosage Forms and Drug Delivery Systems*” (ANSEL *et al*, 1994, WILLIAMS & WILKINS).

The aforementioned excipients are selected according to the dosage form and
15 the desired mode of administration.

Compositions of this invention may be administered in any manner, including, but not limited to, orally, parenterally, sublingually, transdermally, vaginally, rectally, transmucosally, topically, intranasally via inhalation, via buccal or intranasal administration, or combinations thereof. Parenteral administration includes, but is not
20 limited to, intravenous, intra-arterial, intra-peritoneal, subcutaneous, intramuscular, intra-theal, and intra-articular. The compositions of this invention may also be administered in the form of an implant, which allows slow release of the compositions as well as a slow controlled i.v. infusion.

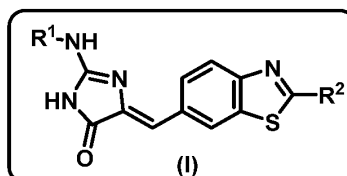
For example, a compound of formula (I) can be present in any pharmaceutical
25 form which is suitable for enteral or parenteral administration, in association with appropriate excipients, for example in the form of plain or coated tablets, hard gelatine, soft shell capsules and other capsules, suppositories, or drinkable, such as suspensions, syrups, or injectable solutions or suspensions.

In a particular embodiment, a compound of formula (I) according to the
30 invention is administered orally.

Oral route of administration is in particular preferred in the prophylaxis or treatment aspect of the invention.

CLAIMS

1. A compound of formula (I)



5 wherein R¹ represents:

- (i). a (C₁-C₆)alkyl group substituted by one or two groups selected from a -COOR^a group, a hydroxy group, a halogen atom, a (C₁-C₄)alkoxy group and a benzyloxy group, said benzyloxy being optionally substituted on its phenyl group by one to three halogen atoms,
- (ii). a spiro(C₅-C₁₁)bicyclic ring,
- (iii). a fused phenyl group, selected from phenyl groups fused with a (C₅-C₆)cycloalkyl or (C₅-C₆)heterocycloalkyl, which (C₅-C₆)cycloalkyl and (C₅-C₆)heterocycloalkyl ring optionally comprise an insaturation and is optionally substituted by a (C₁-C₄) alkyl group, a hydroxy group, a halogen atom, a (C₁-C₃)alkoxy group or a -COR^a group,
- (iv). a phenyl group, substituted by one or two groups selected from a (C₁-C₈)alkyl, a (C₁-C₃)fluoroalkyl, a fluoro(C₁-C₄)alkoxy group, a halogen atom, and a (C₄-C₇)heterocycloalkyl group, said (C₄-C₇)heterocycloalkyl group being itself optionally substituted by a (C₁-C₄) alkyl group, or
- (v). a R'-L- group, wherein L is either a single bond or a (C₁-C₃)alkanediyl group, optionally substituted by a group selected from a hydroxy group and a (C₁-C₃)alkoxy group, and

25 R' represents:

- (v.1) a (C₃-C₈)cycloalkyl group, optionally substituted by one, two or three groups selected from a (C₁-C₄)alkyl group, a hydroxy group, a halogen atom and a (C₁-C₃) alkoxy group,

(v.2) a bridged (C₆-C₁₀)cycloalkyl group, optionally substituted by one to three groups selected from a (C₁-C₄)alkyl group, a (C₁-C₄)alkoxy group, a halogen atom, a hydroxy group, a -O-C(O)-R^d group, a -O-C(O)-NHR^d group, a -NH-C(O)-R^d group, a -SO₂-R^d group, a -N(R^e)₂ group and a -COOR^a group,

(v.3) a (C₃-C₈)heterocycloalkyl group, optionally substituted by one to three groups selected from a -COOR^a group, a hydroxy group, a halogen atom, a (C₁-C₄)alkyl group and an oxo group,

(v.4) a (C₃-C₈)heteroaryl group, optionally substituted by one to three groups selected from a halogen atom, a (C₁-C₄)alkyl group, a (C₁-C₄)alkoxy group and a *N*-methylpiperazinyl group, or

(v.5) a bridged (C₆-C₁₀)heterocycloalkyl group, or

(vi). a R'-L- group wherein L is a (C₁-C₃)alkanediyl group, optionally substituted by a group selected from a -NR^bR^c group, a (C₁-C₄)alkoxy group, a hydroxy group, a -COOR^a group and a halogen atom, and

R' is a phenyl group, optionally substituted by one to three groups selected from the group consisting of (C₁-C₆)alkyl group, a fluoro(C₁-C₄)alkyl group and a fluoro(C₁-C₄)alkoxy group, a halogen atom and a hydroxy group,

R^a represents a (C₁-C₄)alkyl group or a hydrogen atom,

R^b and R^c independently represent a (C₁-C₆)alkyl group or a hydrogen atom,

R^d represents a (C₁-C₄)alkyl group or a cyclopropyl group,

R^e represents a (C₁-C₃)alkyl group, and

R² represents a hydrogen atom or a (C₁-C₃)alkyl group,

or any of its pharmaceutically acceptable salt.

2. A compound of formula (I) according to claim 1, wherein R¹ represents:

(i). a (C₂-C₆)alkyl group substituted by one or two groups selected from a -COOR^a group, a hydroxy group, a halogen atom, a (C₁-C₄)alkoxy group and a benzyloxy group, said

- benzyloxy being optionally substituted on its phenyl group by one to three halogen atoms,
- (ii). a spiro(C₇-C₉)bicyclic ring,
- (iii). a fused phenyl group, selected from phenyl groups fused with a cyclopentyl or a heterocyclopentyl, which cyclopentyl and heterocyclopentyl group optionally comprise an insaturation and is optionally substituted by a (C₁-C₄) alkyl group, a hydroxy group, a halogen atom, a (C₁-C₃)alkoxy group or a -COR^a group,
- (iv). a phenyl group, substituted by one or two groups selected from (C₁-C₈)alkyl, a (C₁-C₃)fluoroalkyl, a fluoro(C₁-C₄)alkoxy group a halogen atom, and a (C₄-C₇)heterocycloalkyl group, said (C₄-C₇)heterocycloalkyl group being itself optionally substituted by a (C₁-C₄) alkyl group, or
- (v). a R'-L- group wherein
- L is either a single bond or a (C₁-C₃)alkanediyl group, optionally substituted by a group selected from a hydroxy group and a (C₁-C₃)alkoxy group, and
 - R' represents:
 - (v.1) a (C₃-C₈)cycloalkyl group, optionally substituted by one, two or three groups selected from a (C₁-C₄)alkyl group, a hydroxy group, a fluor atom and a (C₁-C₃) alkoxy group,
 - (v.2) a bridged (C₇-C₁₀)cycloalkyl group, optionally substituted by one to three groups selected from a (C₁-C₄)alkyl group, a (C₁-C₄)alkoxy group, a hydroxy group, a halogen atom, a -O-C(O)-R^d group, a -O-C(O)-NHR^d group, a -NH-C(O)-R^d group, a -SO₂-R^d group, a -N(R^e)₂ group and a -COOR^a group,
 - (v.3) a (C₄-C₇)heterocycloalkyl group, optionally substituted by one to three groups selected from a -COOR^a group, a hydroxy group, a halogen atom, a (C₁-C₄)alkyl group and a oxo group,

- (v.4) a heteroaryl group, optionally substituted by one to three groups selected from a halogen atom, (C₁-C₄)alkyl group, a (C₁-C₄)alkoxy group, a *N*-methylpiperazinyl group, or
- (v.5) a bridged (C₆-C₁₀)heterocycloalkyl group, or
- 5 (vi). a R'-L- group wherein
- L is a (C₁-C₃)alkanediyl group, optionally substituted by a group selected from a -NR^bR^c group, a (C₁-C₄)alkoxy group, a hydroxy group, a -COOR^a group and a halogen atom, and
 - 10 • R' is a phenyl group, optionally substituted by one to three groups selected from the group consisting of (C₁-C₆)alkyl group, a fluoro(C₁-C₄)alkyl group and a fluoro(C₁-C₄)alkoxy group, a hydroxy group and a halogen atom,
- 15 R^a represents a (C₁-C₄)alkyl group or a hydrogen atom,
 R^b and R^c independently represent a (C₁-C₆)alkyl group or a hydrogen atom,
 R^d represents a (C₁-C₄)alkyl group or a cyclopropyl group,
 R^e represents a (C₁-C₃)alkyl group, and
 R² represents a hydrogen atom or a (C₁-C₃)alkyl group,
 20 or any of its pharmaceutically acceptable salt.

3. A compound of formula (I) according to any of claims 1 or 2, wherein R¹ represents:

- 25 (i). a (C₂-C₆)alkyl group substituted by one or two groups selected from a -COOCH₃ group, a hydroxy group, a fluorine atom, a methoxy group, an ethoxy group, a *tert*-butoxy group, a cyclopropoxy group and a benzyloxy group, said benzyloxy being optionally substituted on its phenyl group by a fluorine atom,
- 30 (ii). a spiro(C₇-C₈)bicyclic ring, in particular a spiro[3.3]heptyl, a spiro[2.5]octanyl or a 7-azaspiro[3.5]nonyl,
- (iii). a fused phenyl group, chosen from phenyl groups fused with a cyclopentyl or a heterocyclopentyl, which cyclopentyl and

heterocyclopentyl group optionally comprise an insaturation and is optionally substituted by a methyl, a hydroxy group, a methoxy group and a -COCH₃ group,

(iv). a phenyl group, substituted by one or two groups selected from a methyl, a hexyl, a trifluoromethyl, a difluoromethoxy group, a halogen atom, in particular a fluor atom, a morpholino group and a *N*-methylpiperazinyl group, or

(v). a R'-L- group wherein L is either a single bond or a (C₁-C₃)alkanediyl group, optionally substituted by a group chosen from a hydroxy group and a (C₁-C₃)alkoxy group,

and R' is selected from the group consisting of:

(v.1). a (C₃-C₈)cycloalkyl group in particular a cyclopropyl, a cyclobutyl, a cyclopentyl, a cyclohexyl, a cycloheptyl or a cyclooctyl, optionally substituted by one, two or three groups selected from a methyl, an isopropyl, a hydroxy group and a methoxy group,

(v.2). a bridged (C₇-C₁₀)cycloalkyl group, in particular an adamantyl or a bicyclo[3.1.1]heptyl, optionally substituted by one to three groups selected from a methyl group, a methoxy group, a hydroxy group, a fluorine atom, a -O-C(O)-CH₃ group, a -O-C(O)-C(CH₃)₃ group, a -O-C(O)-NH-C(CH₃)₃ group, a -NH-C(O)-CH₃ group, a -NH-C(O)-C₃H₄ group, a -S(O)₂-CH₃ group, a -S(O)₂-C₃H₄ group, a -N(CH₃)₂ group and a -C(O)-O-CH₃ group,

(v.3). a (C₅-C₈)heterocycloalkyl group, in particular a tetrahydropyranyl, a piperidinyl, an oxetanyl, a tetrahydrofuranyl, an oxepanyl, a tetrahydrothiopyranyl, a pyrrolidinyl, a dioxepanyl or a piperidinyl, optionally substituted by one, two or three group(s) selected from a -COOR^f group, a hydroxy group, a methyl group and an oxo group, wherein R^f represents either an ethyl or an isopropyl group,

(v.4). a heteroaryl group, in particular a pyrimidinyl, a pyridinyl, a thiazolyl, a imidazolyl, a pyrazolyl, a thiadiazolyl, a

pyridazinyl, a pyrazinyl, a furyl, optionally substituted by one to three groups selected from methyl group, a methoxy group and a *N*-methylpiperazinyl group, or

(v.5). a bridged (C₇-C₁₀)cycloalkyl group, in particular a
5 quinuclidine-3-yl, or

(vi). a R'-L- group wherein L is a (C₁-C₃)alkanediyl group, optionally substituted by a group selected from the group consisting of a -NR^bR^c group, a (C₁-C₄)alkoxy group, a hydroxy group, a -COOR^a group and a halogen atom, in particular a fluor atom, and

10 R' is a phenyl group, optionally substituted by one or two groups selected from the group consisting of methyl group, a trifluoromethyl group and a trifluoromethoxy group,

R^a representing a (C₁-C₃)alkyl group,

R^b and R^c are independently chosen from a methyl group or a hydrogen atom, and

15 R² represents a hydrogen atom or a (C₁-C₃)alkyl group,

or any of its pharmaceutically acceptable salts.

4. A compound of formula (I) according to any of the preceding claims, wherein L is selected from a group consisting of a -CH₂- group, a -CH(CH₃)- group, a
20 -CH(CH₂OH)-CH₂- group, a -CH(CH₂OH)- group, a -CH(CH₂OCH₃)- group, a -CH(OH)-CH₂- group, a -CH₂-CH(CH₂OCH₃)- group, a -CH(OCH₃)-CH₂- group, a -CH₂-CH(COOCH₃)- group, a -CH(CH₂F)- group, a -CH(CH₂NH₂)- group, a -CH(CH₂NHCH₃)- group, a -CH(CH₂N(CH₃)₂)- group, a -CH₂-CH(CH₂OH)- group, a -CH(OCH₃)-CH₂- group, a -CH₂-CH(OCH₃)- group, a -CH₂-CH(OH)-CH₂- group, a
25 -CH₂-CH(OCH₃)-CH₂ group, a -(CH₂)₃- group, a -(CH₂)₂- group and a -CH(CH₂OC(CH₃)₃) group, or any of its pharmaceutically acceptable salts.

5. A compound of formula (I) according to any of the preceding claims, wherein:

30 (v.1). when R' is a (C₃-C₈)cycloalkyl group, L is selected from the group consisting of a single bond, a -CH₂- group, a -CH(CH₃)- group, a

-CH(CH₂OH)-CH₂- group, a -CH(CH₂OH)- group, a -CH(CH₂OCH₃)- group and a -CH(OH)-CH₂- group and a -CH(OCH₃)-CH₂- group,

(v.2). when R' is a bridged (C₇-C₁₀)cycloalkyl group, L is a single bond, a -CH₂- group or a -CH(CH₃)- group,

(v.3). when R' is a (C₅-C₈)heterocycloalkyl group including spiro(C₃-C₈)heterocycloalkyls, L is a single bond or a -CH₂- group,

(v.4). when R' is a phenyl, L is selected from the group consisting of a single bond, a -CH₂- group, a -CH₂-CH(COOCH₃)- group, a -CH(CH₂F)- group, a -CH(CH₂NH₂)- group, a -CH(CH₂NHCH₃)- group, a -CH(CH₂N(CH₃)₂)- group, a -CH₂-CH(CH₂OH)- group, a -CH(CH₂OH)- group, a -CH(CH₂OCH₃)- group, a -CH(OH)-CH₂- group, a -CH₂-CH(CH₂OCH₃)- group, a -CH₂-CH(OH)-CH₂- group and a -CH₂-CH(OCH₃)-CH₂ group,

(v.5). when R' is a heteroaryl group, L is selected from the group comprising a single bond, a -CH₂- group, a -(CH₂)₃- group and a -(CH₂)₂- group, and

(v.6). when R' is a bridged (C₇-C₁₀)heterocycloalkyl group, L is a single bond.

6. A compound of formula (I) according to any of the preceding claims, wherein R¹ represents:

- an adamantyl group, optionally substituted by one to three groups, and in particular substituted by one group, selected from a methyl group, a methoxy group, a hydroxy group, a fluorine atom, a -O-C(O)-CH₃ group, a -O-C(O)-C(CH₃)₃ group, a -O-C(O)-NH-C(CH₃)₃ group, a -NH-C(O)-CH₃ group, a -NH-C(O)-C₃H₄ group, a -S(O)₂-CH₃ group, a -S(O)₂-C₃H₄ group, a -N(CH₃)₂ group and a -C(O)-O-CH₃ group, the adamantyl group being preferably unsubstituted; or

- a R''-O-CH₂(R''')- group, wherein:

- R'' is a (C₁-C₄)alkyl group, preferably a methyl or ethyl group, and
- R''' is a (C₁-C₄)alkyl group, in particular a (C₃-C₄)alkyl group, and preferably an isopropylmethyl group, or

- 5 ○ R''' is a phenyl group, optionally substituted by one to three groups and in particular substituted by one group, selected from the group consisting of a (C₁-C₆)alkyl group, a fluoro(C₁-C₄)alkyl group, a fluoro(C₁-C₄)alkoxy group, a halogen atom and a hydroxy group, the phenyl group being preferably unsubstituted.

7. A compound of formula (I) according to claim 1, wherein R¹ represents:

- 10 - a (C₁-C₆)alkyl group substituted by one or two groups selected from a -COOR^a group, a hydroxy group, a fluorine atom, a (C₁-C₄)alkoxy group and a benzyloxy group, said benzyloxy being optionally substituted on its phenyl group by a halogen atom,
- a spiro(C₅-C₁₁)bicyclic ring, or
- a R'-L- group, wherein
- 15 ○ L is either a single bond or a (C₁-C₃)alkanediyl group, optionally substituted by a group chosen from a hydroxy group and a (C₁-C₃)alkoxy group, and
- R' is selected from the group consisting of:
- 20 ▪ a (C₃-C₈)cycloalkyl group, optionally substituted by one, two or three groups selected from a halogen atom, a (C₁-C₄)alkyl group, a hydroxy group and a (C₁-C₃)alkoxy group, and
- a bridged (C₆-C₁₀)cycloalkyl group, optionally substituted by one to three groups selected from a (C₁-C₄)alkyl group, a (C₁-C₄)alkoxy group, a halogen atom, a hydroxy group, a -O-C(O)-R^d group, a -O-C(O)-NHR^d group, a -NH-C(O)-R^d group,
- 25 group, a -SO₂-R^d group, a -N(R^e)₂ group and a -COOR^a group,
- R^a representing a (C₁-C₄)alkyl group, R^d representing a (C₁-C₄)alkyl group or a cyclopropyl group and R^e representing a (C₁-C₃)alkyl group, and
- wherein R² represents a hydrogen atom or a (C₁-C₃)alkyl group,
- or any of its pharmaceutically acceptable salt.
- 30

8. A compound of formula (I) according to claim 1, wherein R¹ represents:

- a fused phenyl group, chosen from phenyl groups fused with a (C₅-C₆)cycloalkyl or (C₅-C₆)heterocycloalkyl, which (C₅-C₆)cycloalkyl and (C₅-C₆)heterocycloalkyl group optionally comprise an insaturation and is optionally substituted by a (C₁-C₄) alkyl group, a hydroxy group, a halogen atom, a (C₁-C₃)alkoxy group and a -COR^a group,
 - a phenyl group, substituted by one or two groups selected from (C₁-C₈)alkyl, a (C₁-C₃)fluoroalkyl, a fluoro(C₁-C₄)alkoxy group a halogen atom, and a (C₄-C₇)heterocycloalkyl group said (C₄-C₇)heterocycloalkyl group being itself optionally substituted by a (C₁-C₄) alkyl group, or
 - a R'-L- group, wherein
 - o L is a (C₁-C₃)alkanediyl group, optionally substituted by a group chosen from a hydroxy group, a (C₁-C₄)alkoxy group, a -NR^bR^c group, a -COOR^a group and a halogen atom, and
 - o R' is a phenyl group, optionally substituted by one to three groups selected from the group consisting of (C₁-C₆)alkyl group, a fluoro(C₁-C₄)alkyl group and a fluoro(C₁-C₄)alkoxy group, a halogen atom and a hydroxy group,
 wherein R^a is a (C₁-C₄)alkyl or a hydrogen atom and R^b and R^c are independently chosen from (C₁-C₆)alkyl and a hydrogen atom, and
- wherein R² represents a hydrogen atom or a (C₁-C₃)alkyl group,
or any pharmaceutically acceptable salt thereof.

9. A compound of formula (I) according to any of the preceding claims, wherein R² represents a hydrogen atom or a methyl group.

10. A compound of formula (I) according to claim 1, wherein R¹ represents a R'-L- group wherein

- R' is a (C₃-C₈)heteroaryl group, optionally substituted by one to three groups selected from a halogen atom, a (C₁-C₄)alkyl group, a (C₁-C₄)alkoxy group and a *N*-methylpiperazinyl group, and
 - L is a (C₁-C₃)alkanediyl or a single bond, and
- wherein R² represents a hydrogen atom,

or any pharmaceutically acceptable salt thereof.

11. A compound of formula (I) according to claim 1, wherein R¹ represents a R'-L- group wherein

- 5 - R' is a (C₃-C₅)heterocycloalkyl group, optionally substituted by one to three groups selected from a hydroxy group, a (C₁-C₄)alkyl group, an oxo group and a -COOR^a group wherein R^a is as defined in claim 1, and
- L is a methylene or a single bond, and

wherein R² represents a hydrogen atom,

10 or any pharmaceutically acceptable salt thereof.

12. A compound of formula (I) according to anyone of claims 1 to 5 selected from:

- 15 (1) (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-(cyclopropylmethylamino)-1H-imidazol-5-one,
- (2) (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-(cyclopropylamino)-1H-imidazol-5-one,
- (3) (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-(cyclobutylamino)-1H-imidazol-5-one,
- 20 (4) (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-(cyclopentylamino)-1H-imidazol-5-one,
- (5) (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-(cyclohexylmethylamino)-1H-imidazol-5-one,
- (6) (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-(cyclohexylamino)-1H-imidazol-5-one,
- 25 (7) (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-(cycloheptylmethylamino)-1H-imidazol-5-one,
- (8) (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-(cycloheptylamino)-1H-imidazol-5-one,
- 30 (9) (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-(cyclooctylamino)-1H-imidazol-5-one,

- (10) (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(3-hydroxy-2,2-dimethylpropyl)amino]-1*H*-imidazol-5-one,
- (11) (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-(2-benzyloxyethylamino)-1*H*-imidazol-5-one,
- 5 (12) (±)-(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[*cis*-2-methylcyclohexyl]amino]-1*H*-imidazol-5-one,
- (13) (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(1*R*)-1-cyclohexylethyl]amino]-1*H*-imidazol-5-one,
- (14) (4Z)-2-(1-Adamantylmethylamino)-4-(1,3-benzothiazol-6-ylmethylene)-1*H*-imidazol-5-one,
- 10 (15) (±)-(4Z)-2-[1-(1-Adamantyl)ethylamino]-4-(1,3-benzothiazol-6-ylmethylene)-1*H*-imidazol-5-one,
- (16) (4Z)-2-(1-Adamantylamino)-4-(1,3-benzothiazol-6-ylmethylene)-1*H*-imidazol-5-one,
- 15 (17) (4Z)-2-(2-Adamantylamino)-4-(1,3-benzothiazol-6-ylmethylene)-1*H*-imidazol-5-one,
- (18) (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[3,5-dimethyl-1-adamantyl]amino]-1*H*-imidazol-5-one,
- (19) (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(*trans*-5-hydroxy-2-adamantyl)amino]-1*H*-imidazol-5-one,
- 20 (20) (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(3-hydroxy-1-adamantyl)amino]-1*H*-imidazol-5-one,
- (21) (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(3-methoxy-1-adamantyl)amino]-1*H*-imidazol-5-one,
- 25 (22) (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[(1*R*,2*R*,3*R*,5*S*)-2,6,6-trimethylnorpinan-3-yl]amino]-1*H*-imidazol-5-one,
- (23) (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[(1*S*,2*S*,3*S*,5*R*)-2,6,6-trimethylnorpinan-3-yl]amino]-1*H*-imidazol-5-one,
- (24) (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[(1*R*,2*R*,5*R*)-6,6-dimethylnorpinan-2-yl]methylamino]-1*H*-imidazol-5-one,
- 30 (25) (±)-(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-(spiro[2.5]octan-2-ylamino)-1*H*-imidazol-5-one,

- (26) (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-(spiro[3.3]heptan-2-ylamino)-1*H*-imidazol-5-one,
- (27) (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[*(2R)*-1,7,7-trimethylnorbornan-2-yl]amino]-1*H*-imidazol-5-one,
- 5 (28) (±)-(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-(norbornan-2-ylamino)-1*H*-imidazol-5-one,
- (29) (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[*(1R,2S,5R)*-2-isopropyl-5-methyl-cyclohexyl]amino]-1*H*-imidazol-5-one,
- (30) (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[*(1R)*-1-(cyclohexylmethyl)-2-hydroxy-ethyl]amino]-1*H*-imidazol-5-one,
- 10 (31) (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[*(1R)*-1-(cyclopentylmethyl)-2-hydroxy-ethyl]amino]-1*H*-imidazol-5-one,
- (32) (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[*(1R)*-1-(cyclobutylmethyl)-2-hydroxy-ethyl]amino]-1*H*-imidazol-5-one,
- 15 (33) (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[*(1R)*-1-(cyclopropylmethyl)-2-hydroxy-ethyl]amino]-1*H*-imidazol-5-one,
- (34) (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[*(1R)*-1-(hydroxymethyl)-3-methyl-butyl]amino]-1*H*-imidazol-5-one,
- (35) (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[*(1R)*-1-(methoxymethyl)-3-methyl-butyl]amino]-1*H*-imidazol-5-one,
- 20 (36) (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[*(1S)*-1-(hydroxymethyl)-3-methyl-butyl]amino]-1*H*-imidazol-5-one,
- (37) (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[*(1S)*-1-(methoxymethyl)-3-methyl-butyl]amino]-1*H*-imidazol-5-one,
- 25 (38) (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[*(1R)*-1-(hydroxymethyl)propyl]amino]-1*H*-imidazol-5-one,
- (39) (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[*(1S)*-1-(hydroxymethyl)propyl]amino]-1*H*-imidazol-5-one,
- (40) (±)-(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[1-(fluoromethyl)-3-methyl-butyl]amino]-1*H*-imidazol-5-one,
- 30 (41) (±)-(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(1-cyclohexyl-2-hydroxy-ethyl)amino]-1*H*-imidazol-5-one,

- (42) (±)-(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(1-cyclohexyl-2-methoxy-ethyl)amino]-1*H*-imidazol-5-one,
- (43) (±)-(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(2-cyclohexyl-2-hydroxy-ethyl)amino]-1*H*-imidazol-5-one,
- 5 (44) (±)-(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(2-cyclohexyl-2-methoxy-ethyl)amino]-1*H*-imidazol-5-one,
- (45) (±)-(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[*cis*-2-hydroxycyclopentyl]amino]-1*H*-imidazol-5-one,
- (46) (±)-(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[*trans*-2-hydroxycyclopentyl]amino]-1*H*-imidazol-5-one,
- 10 (47) (±)-(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[*cis*-2-methoxycyclopentyl]amino]-1*H*-imidazol-5-one,
- (48) (±)-(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[*trans*-2-methoxycyclopentyl]amino]-1*H*-imidazol-5-one,
- 15 (49) (±)-(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[*cis*-2-hydroxycyclohexyl]amino]-1*H*-imidazol-5-one,
- (50) (±)-(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[*trans*-2-hydroxycyclohexyl]amino]-1*H*-imidazol-5-one,
- (51) (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[(1*R*,2*S*)-2-hydroxycyclohexyl]amino]-1*H*-imidazol-5-one,
- 20 (52) (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[(1*S*,2*R*)-2-hydroxycyclohexyl]amino]-1*H*-imidazol-5-one,
- (53) (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[(1*R*,2*R*)-2-hydroxycyclohexyl]amino]-1*H*-imidazol-5-one,
- 25 (54) (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[(1*S*,2*S*)-2-hydroxycyclohexyl]amino]-1*H*-imidazol-5-one,
- (55) (±)-(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[*cis*-3-hydroxycyclohexyl]amino]-1*H*-imidazol-5-one,
- (56) (±)-(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[*trans*-3-hydroxycyclohexyl]amino]-1*H*-imidazol-5-one,
- 30 (57) (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(*trans*-4-hydroxycyclohexyl)amino]-1*H*-imidazol-5-one,

- (58) (±)-(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[*cis*-2-methoxycyclohexyl]amino]-1*H*-imidazol-5-one,
- (59) (±)-(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[*trans*-2-methoxycyclohexyl]amino]-1*H*-imidazol-5-one,
- 5 (60) (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[*trans*-4-methoxycyclohexyl]amino]-1*H*-imidazol-5-one,
- (61) (±)-(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[*cis*-2-hydroxycycloheptyl]amino]-1*H*-imidazol-5-one,
- (62) (±)-(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[*trans*-2-hydroxycycloheptyl]amino]-1*H*-imidazol-5-one,
- 10 (63) (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[*(1R,2R)*-2-hydroxycycloheptyl]amino]-1*H*-imidazol-5-one,
- (64) (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[*(1S,2S)*-2-hydroxycycloheptyl]amino]-1*H*-imidazol-5-one,
- 15 (65) (±)-(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[*cis*-3-hydroxycycloheptyl]amino]-1*H*-imidazol-5-one,
- (66) (±)-(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[*trans*-3-hydroxycycloheptyl]amino]-1*H*-imidazol-5-one,
- (67) (±)-(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[*cis*-2-methoxycycloheptyl]amino]-1*H*-imidazol-5-one,
- 20 (68) (±)-(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[*trans*-2-methoxycycloheptyl]amino]-1*H*-imidazol-5-one,
- (69) Methyl (2*S*)-2-[[*(4Z)*-4-(1,3-benzothiazol-6-ylmethylene)-5-oxo-1*H*-imidazol-2-yl]amino]-3-methyl-butanoate,
- 25 (70) Methyl (2*S*)-2-[[*(4Z)*-4-(1,3-benzothiazol-6-ylmethylene)-5-oxo-1*H*-imidazol-2-yl]amino]propanoate,
- (71) Methyl (2*S*)-2-[[*(4Z)*-4-(1,3-benzothiazol-6-ylmethylene)-5-oxo-1*H*-imidazol-2-yl]amino]-4-methyl-pentanoate,
- (72) Methyl (2*R*)-2-[[*(4Z)*-4-(1,3-benzothiazol-6-ylmethylene)-5-oxo-1*H*-imidazol-2-yl]amino]-4-methyl-pentanoate,
- 30 (73) Methyl (2*S*)-2-[[*(4Z)*-4-(1,3-benzothiazol-6-ylmethylene)-5-oxo-1*H*-imidazol-2-yl]amino]-3-hydroxy-butanoate,

- (74) (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-(benzylamino)-1*H*-imidazol-5-one,
- (75) (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-(indan-2-ylamino)-1*H*-imidazol-5-one,
- 5 (76) (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(3,4-dimethylphenyl)methylamino]-1*H*-imidazol-5-one,
- (77) (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(2,4-dimethylphenyl)methylamino]-1*H*-imidazol-5-one,
- (78) (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[2-(trifluoromethyl)phenyl]methylamino]-1*H*-imidazol-5-one,
- 10 (79) (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[2-(trifluoromethoxy)phenyl]methylamino]-1*H*-imidazol-5-one,
- (80) (±)-(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[*cis*-2-hydroxyindan-1-yl]amino]-1*H*-imidazol-5-one,
- 15 (81) (±)-(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[*trans*-2-hydroxyindan-1-yl]amino]-1*H*-imidazol-5-one,
- (82) (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[*(1R,2R)*-2-hydroxyindan-1-yl]amino]-1*H*-imidazol-5-one,
- (83) (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[*(1S,2S)*-2-hydroxyindan-1-yl]amino]-1*H*-imidazol-5-one,
- 20 (84) (±)-(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[*cis*-2-methoxyindan-1-yl]amino]-1*H*-imidazol-5-one,
- (85) (±)-(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[*trans*-2-methoxyindan-1-yl]amino]-1*H*-imidazol-5-one,
- 25 (86) Methyl (2*S*)-2-[[*(4Z)*-4-(1,3-benzothiazol-6-ylmethylene)-5-oxo-1*H*-imidazol-2-yl]amino]-3-phenyl-propanoate,
- (87) Methyl (2*R*)-2-[[*(4Z)*-4-(1,3-benzothiazol-6-ylmethylene)-5-oxo-1*H*-imidazol-2-yl]amino]-3-phenyl-propanoate,
- (88) (±)-(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(2-fluoro-1-phenylethyl)amino]-1*H*-imidazol-5-one,
- 30 (89) (±)-(4Z)-2-[(2-Amino-1-phenyl-ethyl)amino]-4-(1,3-benzothiazol-6-ylmethylene)-1*H*-imidazol-5-one dihydrochloride,

- (90) ($\pm$)-(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[2-(methylamino)-1-phenyl-ethyl]amino]-1*H*-imidazol-5-one dihydrochloride,
- (91) ($\pm$)-(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[2-(dimethylamino)-1-phenyl-ethyl]amino]-1*H*-imidazol-5-one,
- 5 (92) ($\pm$)-(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(1-benzyl-2-hydroxy-ethyl)amino]-1*H*-imidazol-5-one,
- (93) (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(1*R*)-1-benzyl-2-hydroxy-ethyl]amino]-1*H*-imidazol-5-one,
- (94) ($\pm$)-(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(1-benzyl-2-methoxy-ethyl)amino]-1*H*-imidazol-5-one,
- 10 (95) ($\pm$)-(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(2-hydroxy-1-phenyl-ethyl)amino]-1*H*-imidazol-5-one,
- (96) (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(1*R*)-2-hydroxy-1-phenyl-ethyl]amino]-1*H*-imidazol-5-one,
- 15 (97) (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(1*S*)-2-hydroxy-1-phenyl-ethyl]amino]-1*H*-imidazol-5-one,
- (98) ($\pm$)-(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(2-methoxy-1-phenyl-ethyl)amino]-1*H*-imidazol-5-one,
- (99) ($\pm$)-(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(2-hydroxy-2-phenyl-ethyl)amino]-1*H*-imidazol-5-one,
- 20 (100) ($\pm$)-(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(2-methoxy-2-phenyl-ethyl)amino]-1*H*-imidazol-5-one,
- (101) ($\pm$)-(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(2-hydroxy-3-phenyl-propyl)amino]-1*H*-imidazol-5-one,
- 25 (102) ($\pm$)-(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(2-methoxy-3-phenyl-propyl)amino]-1*H*-imidazol-5-one,
- (103) (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(5-methylpyrazin-2-yl)methylamino]-1*H*-imidazol-5-one,
- (104) (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-(2-pyridylmethylamino)-1*H*-imidazol-5-one,
- 30 (105) (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-(3-pyridylmethylamino)-1*H*-imidazol-5-one,

- (106) (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-(4-pyridylmethylamino)-1*H*-imidazol-5-one,
- (107) (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(5-methyl-2-furyl)methylamino]-1*H*-imidazol-5-one,
- 5 (108) (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(4-methylthiazol-2-yl)methylamino]-1*H*-imidazol-5-one,
- (109) (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-(3-imidazol-1-ylpropylamino)-1*H*-imidazol-5-one,
- (110) (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[2-(2-pyridyl)ethylamino]-10 1*H*-imidazol-5-one,
- (111) (4Z)-2-(1,3-Benzothiazol-2-ylmethylamino)-4-(1,3-benzothiazol-6-ylmethylene)-1*H*-imidazol-5-one,
- (112) (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(1-methyl-4-piperidyl)methylamino]-1*H*-imidazol-5-one,
- 15 (113) (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-(tetrahydropyran-4-ylmethylamino)-1*H*-imidazol-5-one,
- (114) *Tert*-butyl 4-[[[(4Z)-4-(1,3-benzothiazol-6-ylmethylene)-5-oxo-1*H*-imidazol-2-yl]amino]methyl]piperidine-1-carboxylate,
- (115) (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(7-methyl-7-azaspiro[3.5]nonan-2-yl)amino]-1*H*-imidazol-5-one,
- 20 (116) (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-(3-fluoro-4-methyl-anilino)-1*H*-imidazol-5-one,
- (117) (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-(4-fluoroanilino)-1*H*-imidazol-5-one,
- 25 (118) (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-(4-hexylanilino)-1*H*-imidazol-5-one,
- (119) (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[4-(4-methylpiperazin-1-yl)anilino]-1*H*-imidazol-5-one,
- (120) (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[3-(difluoromethoxy)anilino]-1*H*-imidazol-5-one,
- 30 (121) (4Z)-2-[(1-Acetylinolin-6-yl)amino]-4-(1,3-benzothiazol-6-ylmethylene)-1*H*-imidazol-5-one,

- (122) (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[3-(trifluoromethyl)anilino]-1*H*-imidazol-5-one,
- (123) (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-(indan-5-ylamino)-1*H*-imidazol-5-one,
- 5 (124) (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-(4-morpholinoanilino)-1*H*-imidazol-5-one,
- (125) (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(1-methylindazol-7-yl)amino]-1*H*-imidazol-5-one,
- (126) (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-(pyrimidin-2-ylamino)-1*H*-imidazol-5-one,
- 10 (127) (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-(2-pyridylamino)-1*H*-imidazol-5-one,
- (128) (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(1-methylpyrazol-3-yl)amino]-1*H*-imidazol-5-one,
- 15 (129) (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(2-methoxy-6-methyl-3-pyridyl)amino]-1*H*-imidazol-5-one,
- (130) (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-(pyrimidin-5-ylamino)-1*H*-imidazol-5-one,
- (131) (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-(3-pyridylamino)-1*H*-imidazol-5-one,
- 20 (132) (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-(1,3,4-thiadiazol-2-ylamino)-1*H*-imidazol-5-one,
- (133) (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[5-(4-methylpiperazin-1-yl)-2-pyridyl]amino]-1*H*-imidazol-5-one,
- 25 (134) (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[6-(4-methylpiperazin-1-yl)-3-pyridyl]amino]-1*H*-imidazol-5-one,
- (135) (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[2-(4-methylpiperazin-1-yl)pyrimidin-5-yl]amino]-1*H*-imidazol-5-one,
- (136) (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[5-(4-methylpiperazin-1-yl)pyrimidin-2-yl]amino]-1*H*-imidazol-5-one,
- 30 (137) (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[5-(4-methylpiperazin-1-yl)pyrazin-2-yl]amino]-1*H*-imidazol-5-one,

- (138) (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[6-(4-methylpiperazin-1-yl)pyridazin-3-yl]amino]-1*H*-imidazol-5-one,
- (139) (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-(tetrahydropyran-4-ylamino)-1*H*-imidazol-5-one,
- 5 (140) *Tert*-butyl 4-[[4-(4Z)-4-(1,3-benzothiazol-6-ylmethylene)-5-oxo-1*H*-imidazol-2-yl]amino]piperidine-1-carboxylate,
- (141) Ethyl 4-[[4-(4Z)-4-(1,3-benzothiazol-6-ylmethylene)-5-oxo-1*H*-imidazol-2-yl]amino]piperidine-1-carboxylate,
- (142) (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(1-methyl-4-piperidyl)amino]-1*H*-imidazol-5-one,
- 10 (143) (±)-(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(1-methyl-3-piperidyl)amino]-1*H*-imidazol-5-one,
- (144) (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-(oxetan-3-ylamino)-1*H*-imidazol-5-one,
- 15 (145) (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(3*R*)-tetrahydrofuran-3-yl]amino]-1*H*-imidazol-5-one,
- (146) (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(3*S*)-tetrahydrofuran-3-yl]amino]-1*H*-imidazol-5-one,
- (147) (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(3*R*)-tetrahydropyran-3-yl]amino]-1*H*-imidazol-5-one,
- 20 (148) (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(3*S*)-tetrahydropyran-3-yl]amino]-1*H*-imidazol-5-one,
- (149) (±)-(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(6,6-dimethyltetrahydropyran-3-yl)amino]-1*H*-imidazol-5-one,
- 25 (149A). (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(3*R*)/(3*S*)-6,6-dimethyltetrahydropyran-3-yl]amino]-1*H*-imidazol-5-one,
- (149B). (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(3*R*)/(3*S*)-6,6-dimethyltetrahydropyran-3-yl]amino]-1*H*-imidazol-5-one,
- (150) (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(3*R*,4*R*)-4-hydroxytetrahydropyran-3-yl]amino]-1*H*-imidazol-5-one,
- 30 (151) (±)-(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-(oxepan-3-ylamino)-1*H*-imidazol-5-one,

- (152) ($\pm$)-3-[[*(4Z)*-4-(1,3-Benzothiazol-6-ylmethylene)-5-oxo-1*H*-imidazol-2-yl]amino]piperidin-2-one,
- (153) (3*S*)-3-[[*(4Z)*-4-(1,3-Benzothiazol-6-ylmethylene)-5-oxo-1*H*-imidazol-2-yl]amino]piperidin-2-one,
- 5 (154) (5*S*)-5-[[*(4Z)*-4-(1,3-Benzothiazol-6-ylmethylene)-5-oxo-1*H*-imidazol-2-yl]amino]piperidin-2-one,
- (155) ($\pm$)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(3,3-difluorocyclopentyl)amino]-1*H*-imidazol-5-one,
- (156) *(4Z)*-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(4,4-difluorocyclohexyl)amino]-1*H*-imidazol-5-one,
- 10 (157) ($\pm$)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(3,3-difluorocyclohexyl)amino]-1*H*-imidazol-5-one,
- (158) ($\pm$)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(2,2-difluorocyclohexyl)amino]-1*H*-imidazol-5-one,
- 15 (159) ($\pm$)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(3,3-difluorocycloheptyl)amino]-1*H*-imidazol-5-one,
- (160) *(4Z)*-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(1*R*)-1-(fluoromethyl)-3-methyl-butyl]amino]-1*H*-imidazol-5-one,
- (161) *(4Z)*-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(1*S*)-1-(fluoromethyl)-3-methyl-butyl]amino]-1*H*-imidazol-5-one,
- 20 (162) [3-[[*(4Z)*-4-(1,3-Benzothiazol-6-ylmethylene)-5-oxo-1*H*-imidazol-2-yl]amino]-1-adamantyl] acetate,
- (163) [3-[[*(4Z)*-4-(1,3-Benzothiazol-6-ylmethylene)-5-oxo-1*H*-imidazol-2-yl]amino]-1-adamantyl] 2,2-dimethylpropanoate,
- 25 (164) *(4Z)*-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(1*R*,2*R*)-2-methoxycyclopentyl]amino]-1*H*-imidazol-5-one,
- (165) *(4Z)*-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(1*S*,2*S*)-2-methoxycyclopentyl]amino]-1*H*-imidazol-5-one,
- (166) *(4Z)*-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(1*R*,2*R*)-2-methoxycyclohexyl]amino]-1*H*-imidazol-5-one,
- 30 (167) *(4Z)*-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(1*S*,2*S*)-2-methoxycyclohexyl]amino]-1*H*-imidazol-5-one,

- (168) (±)-(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[*cis*-3-methoxycyclohexyl]amino]-1*H*-imidazol-5-one,
- (169) (±)-(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[*trans*-3-methoxycyclohexyl]amino]-1*H*-imidazol-5-one,
- 5 (169A).(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[(1*R*,3*R*)/(1*S*,3*S*)-3-methoxycyclohexyl]amino]-1*H*-imidazol-5-one,
- (169B).(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[(1*R*,3*R*)/(1*S*,3*S*)-3-methoxycyclohexyl]amino]-1*H*-imidazol-5-one,
- (170) (±)-(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[*cis*-4-hydroxycycloheptyl]amino]-1*H*-imidazol-5-one,
- 10 (171) (±)-(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[*trans*-4-hydroxycycloheptyl]amino]-1*H*-imidazol-5-one,
- (171A).(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[(1*R*,4*R*)/(1*S*,4*S*)-4-hydroxycycloheptyl]amino]-1*H*-imidazol-5-one,
- 15 (171B).(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[(1*R*,4*R*)/(1*S*,4*S*)-4-hydroxycycloheptyl]amino]-1*H*-imidazol-5-one,
- (172) (±)-(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[*cis*-3-methoxycycloheptyl]amino]-1*H*-imidazol-5-one,
- (173) (±)-(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[*trans*-3-methoxycycloheptyl]amino]-1*H*-imidazol-5-one,
- 20 (174) (±)-(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[*cis*-4-methoxycycloheptyl]amino]-1*H*-imidazol-5-one,
- (175) (±)-(4Z)-4-(1,3-benzothiazol-6-ylmethylene)-2-[[*trans*-4-methoxycycloheptyl]amino]-1*H*-imidazol-5-one,
- 25 (176) (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[(1*R*)-2-methoxy-1-phenyl-ethyl]amino]-1*H*-imidazol-5-one,
- (177) (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[(1*S*)-2-methoxy-1-phenyl-ethyl]amino]-1*H*-imidazol-5-one,
- (178) (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[(2*R*)-2-hydroxy-2-phenyl-ethyl]amino]-1*H*-imidazol-5-one,
- 30 (179) (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[(2*S*)-2-hydroxy-2-phenyl-ethyl]amino]-1*H*-imidazol-5-one,

- (180) (4Z)-2-[[*(1R)*-2-Amino-1-phenyl-ethyl]amino]-4-(1,3-benzothiazol-6-ylmethylene)-1*H*-imidazol-5-one dihydrochloride,
- (181) (4Z)-2-[[*(1S)*-2-Amino-1-phenyl-ethyl]amino]-4-(1,3-benzothiazol-6-ylmethylene)-1*H*-imidazol-5-one dihydrochloride,
- 5 (182) (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[*(3R)*-quinuclidin-3-yl]amino]-1*H*-imidazol-5-one,
- (183) (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[*(3S)*-quinuclidin-3-yl]amino]-1*H*-imidazol-5-one,
- (184) (±)-(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-(tetrahydrothiopyran-3-ylamino)-1*H*-imidazol-5-one,
- 10 (185) (±)-(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-(1,4-dioxepan-6-ylamino)-1*H*-imidazol-5-one,
- (186) (±)-(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(2-oxopyrrolidin-3-yl)amino]-1*H*-imidazol-5-one,
- 15 (187) (±)-(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(1-methyl-2-oxo-pyrrolidin-3-yl)amino]-1*H*-imidazol-5-one,
- (188) (±)-(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(4,4-dimethyl-2-oxo-pyrrolidin-3-yl)amino]-1*H*-imidazol-5-one,
- (189) (3*R*)-3-[[*(4Z)*-4-(1,3-Benzothiazol-6-ylmethylene)-5-oxo-1*H*-imidazol-2-yl]amino]piperidin-2-one,
- 20 (190) (±)-3-[[*(4Z)*-4-(1,3-Benzothiazol-6-ylmethylene)-5-oxo-1*H*-imidazol-2-yl]amino]-1-methyl-piperidin-2-one,
- (191) (±)-(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(3-methyl-2-oxo-pyrrolidin-3-yl)amino]-1*H*-imidazol-5-one,
- 25 (192) (±)-(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(1,3-dimethyl-2-oxo-pyrrolidin-3-yl)amino]-1*H*-imidazol-5-one,
- (192A).(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[*(3R)*]/(*3S*)-1,3-dimethyl-2-oxo-pyrrolidin-3-yl]amino]-1*H*-imidazol-5-one,
- (192B).(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[*(3R)*]/(*3S*)-1,3-dimethyl-2-oxo-pyrrolidin-3-yl]amino]-1*H*-imidazol-5-one,
- 30 (193) (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[*(3S,4S)*-4-hydroxytetrahydropyran-3-yl]amino]-1*H*-imidazol-5-one,

- (194) (4Z)-2-(3-Noradamantylamino)-4-(1,3-benzothiazol-6-ylmethylene)-1*H*-imidazol-5-one,
- (195) [3-[[[(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-5-oxo-1*H*-imidazol-2-yl]amino]-1-adamantyl] *N*-*tert*-butylcarbamate,
- 5 (196) (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(3-fluoro-1-adamantyl)amino]-1*H*-imidazol-5-one,
- (197) (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[[(1*R*)-1-(*tert*-butoxymethyl)-3-methyl-butyl]amino]-1*H*-imidazol-5-one,
- (198) (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[[(1*R*)-2-*tert*-butoxy-1-phenyl-ethyl]amino]-1*H*-imidazol-5-one,
- 10 (199) *N*-[3-[[[(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-5-oxo-1*H*-imidazol-2-yl]amino]-1-adamantyl]acetamide,
- (200) *N*-[3-[[[(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-5-oxo-1*H*-imidazol-2-yl]amino]-1-adamantyl]cyclopropanecarboxamide,
- 15 (201) *N*-[3-[[[(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-5-oxo-1*H*-imidazol-2-yl]amino]-1-adamantyl]methanesulfonamide,
- (202) *N*-[3-[[[(4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-5-oxo-1*H*-imidazol-2-yl]amino]-1-adamantyl]cyclopropanesulfonamide,
- (203) (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[[3-(dimethylamino)-1-adamantyl]amino]-1*H*-imidazol-5-one,
- 20 (204) Methyl 2-[[[(4Z)-4-(1,3-benzothiazol-6-ylmethylene)-5-oxo-1*H*-imidazol-2-yl]amino]adamantane-2-carboxylate,
- (205) (4Z)-2-(Cyclohexylamino)-4-[(2-methyl-1,3-benzothiazol-6-yl)methylene]-1*H*-imidazol-5-one,
- 25 (206) (4Z)-2-(Cycloheptylamino)-4-[(2-methyl-1,3-benzothiazol-6-yl)methylene]-1*H*-imidazol-5-one,
- (207) (4Z)-2-[[[(1*R*)-1-(Methoxymethyl)-3-methyl-butyl]amino]-4-[(2-methyl-1,3-benzothiazol-6-yl)methylene]-1*H*-imidazol-5-one,
- (208) (4Z)-2-[[[(1*R*)-2-Methoxy-1-phenyl-ethyl]amino]-4-[(2-methyl-1,3-benzothiazol-6-yl)methylene]-1*H*-imidazol-5-one,
- 30 (209) (4Z)-2-(1-Adamantylamino)-4-[(2-methyl-1,3-benzothiazol-6-yl)methylene]-1*H*-imidazol-5-one, and

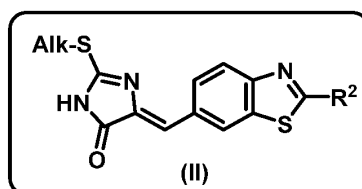
- (210) (4Z)-2-[(3-Hydroxy-1-adamantyl)amino]-4-[(2-methyl-1,3-benzothiazol-6-yl)methylene]-1*H*-imidazol-5-one,
- (211) (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(3,5-dihydroxy-1-adamantyl)amino]-1*H*-imidazol-5-one,
- 5 (212) (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(3,5,7-trifluoro-1-adamantyl)amino]-1*H*-imidazol-5-one,
- (213) (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(1*R*)-1-(ethoxymethyl)-3-methyl-butyl]amino]-1*H*-imidazol-5-one,
- (214) (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(1*R*)-1-(benzyloxymethyl)-3-methyl-butyl]amino]-1*H*-imidazol-5-one,
- 10 (215) (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(1*R*)-1-[(4-fluorophenyl)methoxymethyl]-3-methyl-butyl]amino]-1*H*-imidazol-5-one,
- (216) (4Z)-4-(1,3-Benzothiazol-6-ylmethylene)-2-[(1*R*)-1-(cyclopropoxymethyl)-3-methyl-butyl]amino]-1*H*-imidazol-5-one,
- 15 or anyone of their pharmaceutically acceptable salts.

13. A pharmaceutical composition comprising at least one compound as defined in anyone of claims 1 to 11 or or any of its pharmaceutically acceptable salt or as defined in claim 12.

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14. Synthesis process for manufacturing a compound of formula (I) as defined in anyone of claims 1 to 11 or or any of its pharmaceutically acceptable salt or as defined in claim 12 or any of its pharmaceutically acceptable salts, comprising at least a step of coupling a compound of formula (II) below

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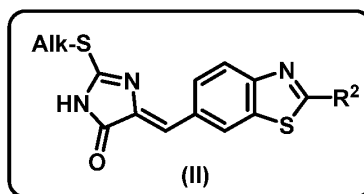


wherein Alk is a (C₁-C₅)alkyl,

with an amine of formula R¹NH₂

wherein R¹ and R² are as defined in anyone of claims 1 to 11.

15. A synthetic intermediate of formula (II) below



wherein Alk is a (C₁-C₅)alkyl, in particular Alk is selected from the group consisting of an ethyl and a methyl and R² is as defined in any one of claims 1 to 11.

16. A compound of formula (I) as defined in any one of claim 1 to 11 or any of its pharmaceutically acceptable salts, or at least any of compounds (1) to (216) as defined in claim 12 or any of its pharmaceutically acceptable salts, for use as a medicament.

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17. A compound of formula (I) according to any one of claims 1 to 11 or any of its pharmaceutically acceptable salts, or at least any of compounds (1) to (216) as defined in claim 12 or any of its pharmaceutically acceptable salts for use in the treatment and/or in the prevention of a disease selected from cognitive deficits associated with Down syndrome (Trisomy 21); Alzheimer's disease and related diseases; dementia; tauopathies; and other neurodegenerative diseases (Parkinson's disease; Pick disease, including Niemann-Pick Type C Disease); CDKL5 Deficiency Disorder; McDermid syndrome; autism; type 1 and type 2 diabetes; abnormal folate and methionine metabolism; osteoarthritis, in particular knee osteoarthritis; Duchenne muscular dystrophy; several cancers, such as brain cancer, including glioblastoma, leukemia, including megakaryoblastic leukemia and acute lymphoblastic leukemia, head and neck squamous cell carcinoma, pancreatic cancer, including pancreatic ductal adenocarcinoma, prostate cancer, gastrointestinal cancer, breast cancer, such as Triple-negative breast cancer (TNBC), tissue cancer, including liposarcoma, Hedgehog/GLI-dependent cancer, liver cancer, including Hepatocellular carcinoma and viral infections, such as caused by Human immunodeficiency virus type 1 (HIV-1), Human cytomegalovirus (HCMV), Influenza A, Herpes virus, rhesus macaque cytomegalovirus, varicella-zoster virus, herpes simplex virus (HSV), Hepatitis C virus, Chikungunya virus, Dengue virus, Influenza virus and Severe acute respiratory syndrome (SARS) coronavirus, Cytomegalovirus and Human

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papillomavirus; neuroinflammation; anemia; infections caused by unicellular parasites, such as malaria, Leishmaniasis, Chagas and sleeping sickness (*Trypanosoma* sp.), and cattle diseases due to unicellular pathogens, and for regulating body temperature.

- 5 18. A compound of formula (I) for use according to anyone of claims 1 to 11
or any of its pharmaceutically acceptable salts, or at least any of compounds (1) to (216) as
defined in claim 12 or any of its pharmaceutically acceptable salts for use in the treatment
and/or prevention of a disease selected from Down syndrome, Alzheimer's disease,
dementia, tauopathies, Parkinson's disease, Niemann-Pick Type C Disease, CDKL5
10 Deficiency Disorder and Phelan-McDermid syndrome and their associated cognitive and
motor conditions and type 1 and type 2 diabetes.