

KINASE INHIBITORS

The CNIO has developed novel pharmaceutical compounds, which are useful as inhibitors of protein or lipid kinases, such as inhibitors of the phosphoinositide 3OH kinase (PI3 kinase) family, particularly the PI3K class I sub-type, or, inhibitors of the mammalian target of rapamycin (mTOR).

Industrial partners are being sought to collaborate through a patent license agreement for the development and exploitation of the technology.

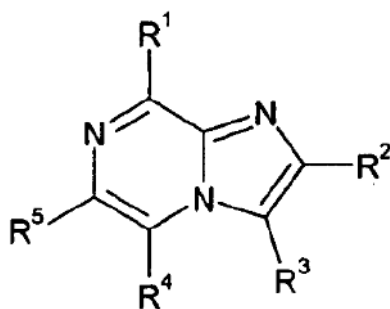
Description

The inventors have found a novel set of compounds useful in the treatment of diseases in which inhibition of a protein or lipid kinase (e.g. a PI3-K and/or mTOR) is desired and/or required, and particularly in the treatment of cancer or a proliferative disease.

Main innovations and advantages

Compounds of the invention are effective inhibitors of protein or lipid kinases, e.g. PI3K, such as class I PI3K, and/or mTOR.

The invention also relates to the use of such compounds as medicaments, to the use of such compounds for the treatment of a disease in which the inhibition of such protein or lipid kinases is desired and/or required such as cancer, to pharmaceutical compositions containing them, and to synthetic routes for their production.



Intellectual property

Patent title :

“Imidazopyrazines for use as kinase inhibitors”

Applicant: Spanish National Cancer Research Center (CNIO)

International patent application:

WO2010119264 (A1)

Patent granted in:

Australia, Brazil, Canada, China, Europe, Eurasia, India, Israel, Japan, South Korea, Mexico, Philippines, USA and South Africa

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USE OF PI3K INIBITORS FOR THE TREATMENT OF OBESITY, STEATOSIS AND AGEING

The inventors have found a method to treat or prevent diseases such as obesity, obesity-associated diseases or conditions, steatosis and biological aging by using a phosphoinositide 3-kinase (PI3K) inhibitor.

Industrial partners are being sought to collaborate through a patent license agreement for the development and exploitation of the technology.

Description

The CNIO has developed a method to treat or prevent diseases or conditions associated with the expression of peroxisome proliferator-activated receptor gamma coactivator 1- α (Pgc1 α) and/or uncoupling protein 1 (Thermogenin or Ucp1) in brown adipocytes, by the use of a phosphoinositide 3-kinase (PI3K) inhibitor (PI3Ki).

Main innovations and advantages

The present invention has surprisingly found the impact of PI3K signalling in the brown adipose tissue and in mammalian longevity. The PI3Ki of the present invention activate brown adipocytes *in vitro* and decrease body weight in obese mice.

The PI3Ki of the present invention are useful in the treatment or prevention of obesity, obesity-associated diseases (such as type 2 (adult-onset) diabetes, high blood pressure, stroke, heart attack, heart failure, gallstones, gout and gouty arthritis, osteoarthritis, sleep apnea and Pickwickian syndrome), steatosis, and also in reducing ageing.

Intellectual property

Patent title :

“Use of PI3K inhibitors for the treatment of obesity, steatosis and ageing”

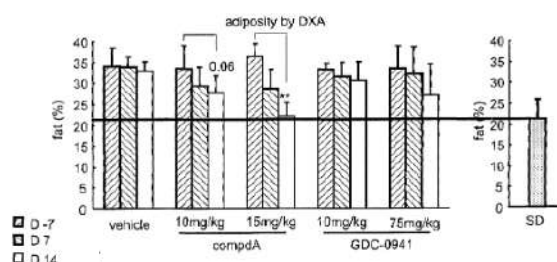
Applicant: Spanish National Cancer Research Center (CNIO)

International patent application:

WO2012052730 (A1)

Patent granted in:

Europe and USA



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INHIBITOR OF ATR

The CNIO has developed inhibitors of ataxia telangiectasia mutated and Rad3-related kinase (ATR).

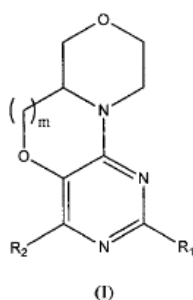
Industrial partners are being sought to collaborate through a patent license agreement for the development and exploitation of the technology.

Description

The inventors have found novel chemical entities with anti-cancer activity, and more specifically to chemical entities that inhibit ATR (Ataxia telangiectasia mutated and Rad3-related kinase). This invention also relates to pharmaceutical compositions containing, and the uses of, such chemical entities.

Main innovations and advantages

The present invention relates to a series of tricyclic chemical entities that are inhibitors of ATR. These chemical entities demonstrate good selectivity for ATR and are potentially useful in the treatment of cancer. The invention further relates to pharmaceutical compositions of the chemical entities, to the use of the compositions as therapeutic agents, and to methods of treatment using these compositions. In an aspect, the present invention provides chemical entities selected from compounds of formula (I).



Intellectual property

Patent title :

“CHEMICAL ENTITIES”

Applicant: Spanish National Cancer Research Center (CNIO)

International patent application:

WO2014140644

Patent extended/granted in: Australia, Brasil, Canada, Chile, China, Colombia, Ecuador, Europe, India, Indonesia, Israel, Japan, Malaysia, Mexico, New Zealand, Peru, Philippines, Russia, Singapore, South Africa Thailand, Taiwan, Ukraine and USA.

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TREATMENT OR PREVENTION OF AGE-RELATED DISORDERS IN ADULT SUBJECTS

The CNIO has developed a method for the amelioration of certain markers of ageing in mammals and the extension of lifespan in adult mammals.

Industrial partners are being sought to collaborate through a patent license agreement for the development and exploitation of the technology.

Description

The inventors have found that the use of a non-integrative nucleic acid vector, such as those derived from adeno-associated viruses (AAV), comprising a coding sequence for telomerase reverse transcriptase (TERT) is useful in the treatment or prevention of age-related disorders in an adult, wherein the treatment does not increase the incidence of cancer in the subject.

Main innovations and advantages

The invention is based on the surprising finding that telomerase-based therapies can be used to improve healthy ageing and extend longevity in an adult/old mammalian organism without increasing the risk of cancer. The extension of lifespan is accompanied by an amelioration of some markers of healthspan that are conventionally considered markers of ageing, such as epithelial barrier fitness, osteoporosis, glucose intolerance with insulin insensitivity, loss of memory, and neuromuscular degeneration associated with loss of neuromuscular coordination.

Intellectual property

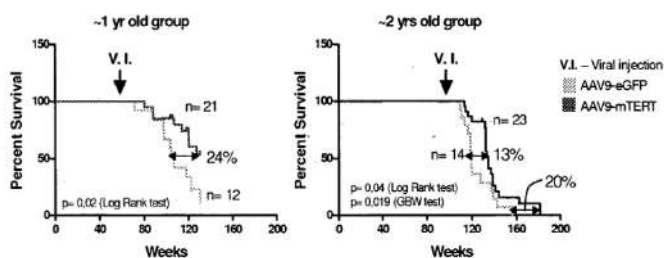
Patent title :

“Telomerase reverse transcriptase for protection against ageing”

Applicants:

Spanish National Cancer Research Center (CNIO) and Universitat Autònoma de Barcelona (UAB)

Patent granted in Europe (EP2402038 B1)



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TREATMENT OF MYOCARDIAL INFARCTION

The CNIO has developed compositions and methods useful for the treatment and prevention of conditions associated with myocardial infarction.

Industrial partners are being sought to collaborate through a patent license agreement for the development and exploitation of the technology.

Description

The inventors have found a novel method for the treatment of myocardial infarction based in non integrative virus vectors, for example, adeno-associated viral vectors (AAV) encoding for telomerase reverse transcriptase (TERT).

Main innovations and advantages

The inventors have found that the vectors of the invention are useful in the treatment of myocardial infarction, for example, in tissue damage resulting from myocardial infarction, fibrosis of the myocardium resulting from myocardial infarction, and reducing cardiac function resulting from myocardial infarction.

Using non-integrative viral vectors, such as AAV, seems to be particularly advantageous. For example, non-integrative vectors do not cause any permanent genetic modification; the vectors target to adult tissues, avoiding having the subjects under the effect of constitutive telomerase expression from early stages of development, and additionally, non-integrative vectors

effectively incorporate a safety mechanism to avoid over-proliferation of TERT expressing cells. .

Intellectual property

Patent title :

“Telomerase reverse transcriptase-based therapies for treatment of conditions associated with myocardial infarction”

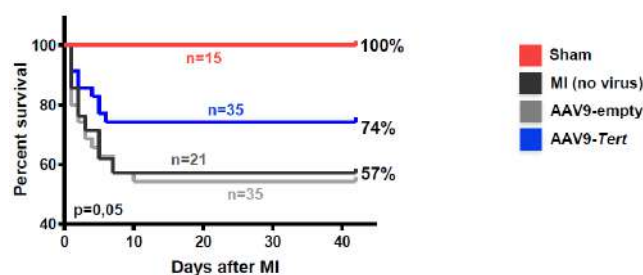
Applicant: Spanish National Cancer Research Center (CNIO) and Universitat Autònoma de Barcelona (UAB).

International patent application:

WO2016020346

Patent granted in:

Europe, Japan and USA.



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PROTEIN KINASE INHIBITORS

The CNIO has developed compounds useful in the treatment of diseases in which inhibition of a protein or lipid kinase (e.g. CDK8 and/or Haspin kinase) is desired and/or required, and particularly in the treatment of cancer or a proliferative disease.

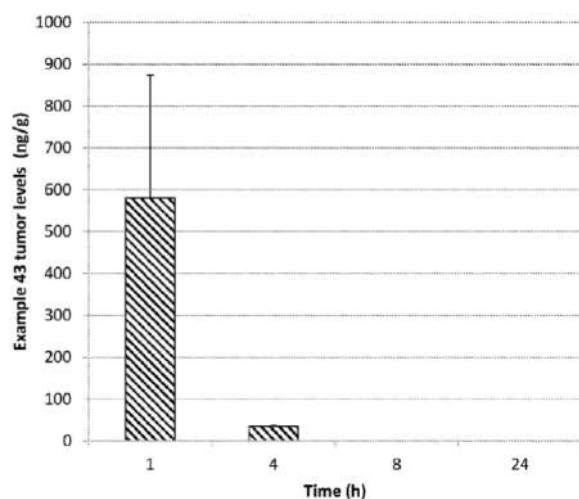
Industrial partners are being sought to collaborate through a patent license agreement for the development and exploitation of the technology

Description

The Experimental Therapeutics Programme from the CNIO has developed novel pharmaceutically-useful compounds, useful as kinase inhibitors (such as inhibitors of the CDK8 and/or Haspin kinases). The compounds are of potential utility in the treatment of diseases such as cancer, particularly colorectal/colon cancer, breast cancer, pancreatic cancer and cervical cancer.

Main innovations and advantages

The compounds of the present invention provide selective targeted therapies which provide advantages over current anti-cancer treatments, for example by reducing side effects (e.g. by preventing the killing of normal cells, as may occur using e.g. chemotherapy).



Intellectual property

Patent title :

“Condensed tricyclic compounds as protein kinase inhibitors”

Applicant: Spanish National Cancer Research Center (CNIO)

International patent application no: WO2017033019 (A1)

Patent granted in: Australia, China, Europe, India, Israel, Japan and USA.

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METHOD FOR EXPANDING STEMNESS AND DIFFERENTIATION POTENTIAL OF PLURIPOTENT CELLS

The CNIO has developed a method for expanding stemness and differentiation potential of pluripotent cells.

Industrial partners are being sought to collaborate through a patent license agreement for the development and exploitation of the technology.

Description

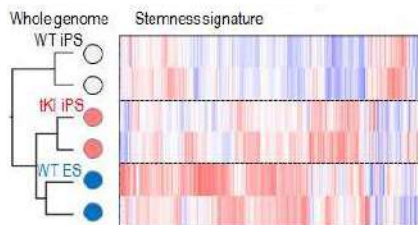
The inventors have found a novel and simple technique based on the transient expression of a single microRNA molecule to expand the differentiation potency of a wide range of PSCs including induced PSCs (iPSCs) as well as embryonic stem cells (ESCs).

Main innovations and advantages

The method of the present invention provides naïve pluripotent cells with an improved capacity to differentiate, that can be used to obtain more efficiently differentiated and mature cells proficient for regenerative medicine strategies.

Exposure to miR-203 improved the generation of unusual differentiated tissues, such as pancreas, bone marrow or trophoblast.

The naïve pluripotent cells resultant from the method of the invention show an improved differentiation and maturation outcome, which can be observed particularly, when differentiated specifically to cardiomyocytes.



Intellectual property

Patent title :

“Method for expanding stemness and differentiation potential of pluripotent cells”

Applicant: Spanish National Cancer Research Center (CNIO)

International patent application: WO2018215662 (A1)

Patent extended in: Canada, Europe, Japan and USA.

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THERAPY AGAINST CANCER

The CNIO has developed a combined therapy against cancer inhibiting expression, activity and/or function of epidermal growth factor receptor (EGFR) and c-RAF.

Industrial partners are being sought to collaborate through a patent license agreement for the development and exploitation of the technology.

Description

The inventors have found a novel pharmaceutical composition comprising an inhibitor of the expression, activity and/or function of c-Raf and an inhibitor of the expression, activity and/or function of EGF Receptor and its use in the treatment of cancer, for example, pancreatic cancer.

Main innovations and advantages

The inventors have shown that the simultaneous deletion of EGFR and c-Raf in pancreatic ductal adenocarcinoma (PDAC) results in a significant therapeutic effect with an extremely low toxicity.

The present invention represents a very promising therapy in the treatment of pancreatic cancer since it leads to a complete tumor regression while its side effects are much smaller than other therapies described up to date.

Intellectual property

Patent title :

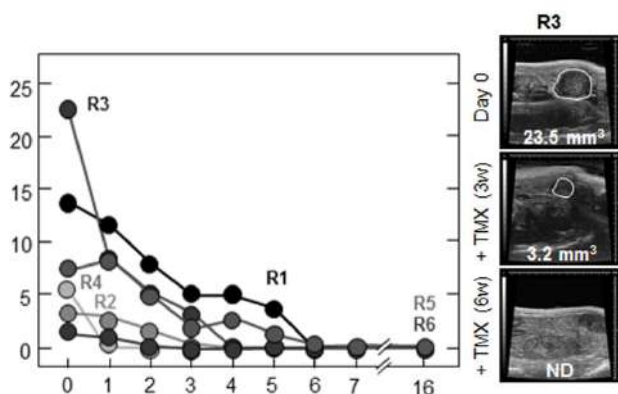
“COMBINED THERAPY INHIBITING EXPRESSION, ACTIVITY AND/OR FUNCTION OF EPIDERMAL GROWTH FACTOR RECEPTOR AND C-RAF AGAINST CANCER”

Applicant: Spanish National Cancer Research Center (CNIO)

International patent application:

WO2020020942

Extended in Europe



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BRAIN CANCER PREVENTION AND/OR TREATMENT

The CNIO has developed TRF1 inhibitors and compositions comprising them for the prevention and/or treatment of brain cancer, for example, glioblastoma.

Industrial partners are being sought to collaborate through a patent license agreement for the development and exploitation of the technology.

Description

The inventors have found TRF1 inhibitors and compositions comprising them for the treatment or prevention of brain cancer, such as glioblastoma, and particularly glioblastoma multiforme (GBM). PI3K inhibitors can be among the TRF1 inhibitors used. The invention also relates to a method for identifying compounds candidates to be used for treating glioblastoma or other cancers.

Main innovations and advantages

The inventors have found a therapy to target brain cancer, such as GBM, based on TRF1 inhibition. Compositions of the invention can comprise more than one TRF1 inhibitor, being particularly advantageous that at least one of the inhibitors is a PI3K inhibitor and that at least a second possible TRF1 inhibitor present selected, for example, from an RTK inhibitor, a MEK inhibitor, an ERK inhibitor, an HSP90 inhibitor, docetaxel or gemcitabine.

Intellectual property

Patent title :

“Modulation of TRF1 for brain cancer treatment”

Applicant:

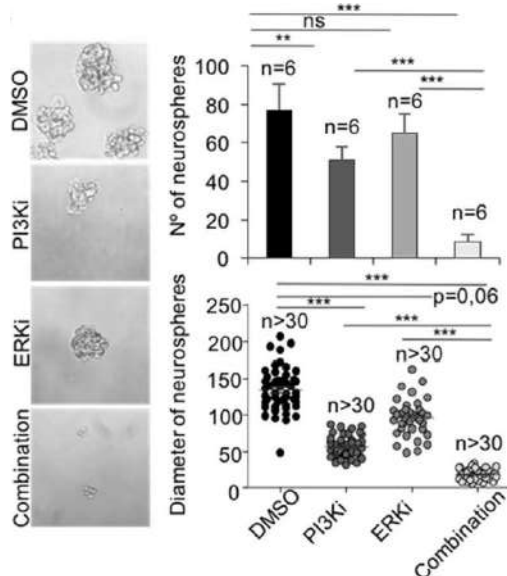
Spanish National Cancer Research Center (CNIO)

International patent application:

WO2020/052772

Patent extended in:

Canada, Europe and USA.



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Method for eliminating cancer cells

The CNIO has developed a gene-editing based cancer treatment where cancer cells are selectively eliminated.

Industrial partners are being sought to collaborate through a patent license agreement for the development and exploitation of the technology.

Description

The inventors have found a novel method for eliminating cancer cells, wherein said cells comprise a genomic rearrangement which leads to genomic amplifications. The present invention provides a way to eliminate cancer cells specifically using endonuclease(s) that cleave the genome at specific sites, which results in a selective elimination of the cancer inducing gene and thereby elimination of the cancer cells.

Main innovations and advantages

The inventors have found a simple and straightforward way to design a treatment which is universal (not patient specific). For those cancers where there is a fusion gene and fusion protein, the present invention allows the truncation or the elimination of the fusion protein, which in turn leads to the death of the cancer cell. The present invention provides a therapy with minimal side effects since the modification of the coding regions of the genome will only take place in cells carrying the genomic rearrangement, i.e. in cancer cells.

Intellectual property

Patent title :

“Gene editing based cancer treatment”

Applicants: Spanish National Cancer Research Center (CNIO) and

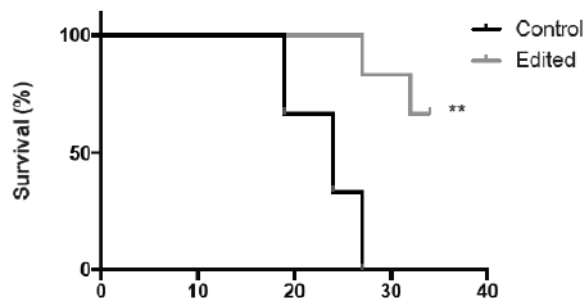
Josep Carreras Leukaemia Research Institute (IJC)

International patent application:

WO2020079243 (A1)

Patent extended in:

Canada, Europe, Japan and USA.



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INHIBITORS OF DISCOIDIN DOMAIN RECEPTORS (DDR1/2)

The CNIO has developed new inhibitors of Discoidin Domain Receptors (DDR1/2).

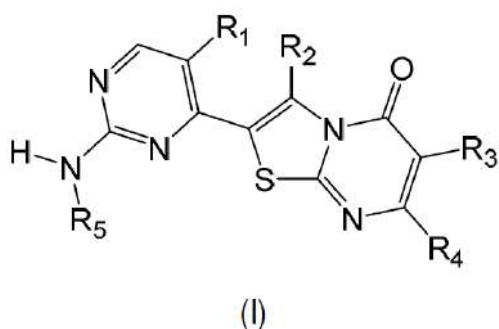
Industrial partners are being sought to collaborate through a patent license agreement for the development and exploitation of the technology.

Description

The inventors have found a novel group of compounds which are inhibitors of DDR1/2, whose overexpression is produced in several diseases such as cancer, pulmonary fibrosis, cirrhotic liver, liver fibrosis, renal disease, lupus nephritis, osteoarthritis, rheumatoid arthritis and atherosclerosis, therefore the compounds of the invention are useful for the treatment of said diseases.

Main innovations and advantages

The present invention refers to a group of compounds with a thienopyrimidone core linked to a second pyrimidine moiety, which are inhibitors of DDR 1/2. The invention also relates to the use of such compounds as medicaments, for the treatment of certain pathologies where DDR 1/2 are overexpressed, to the method for obtaining them, and to synthetic routes for their production



Intellectual property

Patent title :

“Thiazolopyrimidones as inhibitors of DDR1/2 and therapeutic uses thereof”

Applicant: Spanish National Cancer Research Center (CNIO)

International patent application:

WO2022157166 (A1)

Patent application suitable for entering national/regional phase

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METHOD FOR PREDICTING THE BENEFIT OF ENDOCRINE THERAPY IN BREAST CANCER

The CNIO has developed a novel method for predicting the benefit of endocrine therapy alone or in combination with CDK inhibitors in breast cancer.

Industrial partners are being sought to collaborate through a patent license agreement for the development and exploitation of the technology.

Description

The inventors have found that P27 single-nucleotide polymorphism T2871099G is a predictor of the benefit of endocrine therapy alone or in combination with CDK inhibitors in breast cancer.

Main innovations and advantages

The present invention relates to a method to determine the necessity to combine endocrine therapy with CDK4/6 inhibitors, based on P27 T2871099G SNP.

The method of the invention helps to discern which patients are sufficiently well treated with endocrine therapy from those that require combination with CDK inhibitors, in a quick, robust and inexpensive manner.

The present invention is, for example, useful in hormone-positive breast cancer and in particular in early breast cancer.

Intellectual property

Patent title: "P27 single-nucleotide polymorphism T2871099G as a predictor of the benefit of endocrine therapy alone or in combination with CDK inhibitors in breast cancer"

Applicant: Spanish National Cancer Research Center (CNIO).

International patent application:
WO2022161984

Patent suitable for entering
national/regional phase

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SELECTIVE HASPIN INHIBITORS

The CNIO has developed a novel group of compounds with a tricyclic core based on imidazo[1,2-b]pyridazine, which are inhibitors of the protein kinase HASPIN.

Industrial partners are being sought to collaborate through a patent license agreement for the development and exploitation of the technology.

Description

The inventors have found a novel. The present invention relates to a group of compounds with a tricyclic core based on imidazo[1,2-b]pyridazine which are inhibitors of HASPIN, whose activity is required for the proliferation of certain tumoral cells, so the compounds of the invention are useful for the prevention and/or treatment of cancer, alone or in combination with chemotherapeutic agents.

Main innovations and advantages

The novel compounds of the invention are not active for PIM1, thus, they are more selective and less toxic than other compounds of the state of art.

The compounds of the invention are useful for the treatment of cancer that depends on HASPIN, for example, Burkitt's lymphoma, chronic lymphocytic leukemias, pancreatic cancer, gallbladder carcinoma, bladder cancer, prostate cancer, melanoma, breast cancer, or ovarian cancer. They can be used alone or in combination with chemotherapeutic agents, presenting synergistic combination effects.

Intellectual property

Patent title :

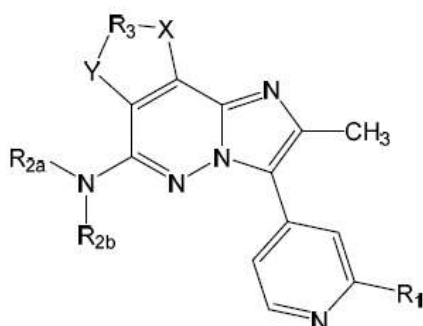
"Imidazo[1,2-b]pyridazine based tricyclic compounds as inhibitors of HASPIN and therapeutic uses thereof"

Applicant: Spanish National Cancer Research Center (CNIO)

International patent application:

WO2022200433

Patent application suitable for entering national/regional phase



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METHOD TO TREAT DYSKERATOSIS CONGENITA

The CNIO has developed a novel method to treat dyskeratosis congenita (DKC).

Industrial partners are being sought to collaborate through a patent license agreement for the development and exploitation of the technology.

Description

The inventors have found a novel method to treat dyskeratosis congenita based on the use of a nucleic acid vector comprising a coding sequence for telomerase reverse transcriptase (TERT).

Main innovations and advantages

The vectors of the invention have a therapeutic benefit in dyskeratosis congenita as can be seen in the experiments performed in a mouse model of the disease.

Non-integrative nucleic acid vectors are preferred, for example, adeno-associated virus (AAV). Using non-integrative viral vectors seems to be particularly advantageous. For example, non-integrative vectors do not cause any permanent genetic modification; the vectors target to adult tissues, avoiding having the subjects under the effect of constitutive telomerase expression from early stages of development, and additionally, non-integrative vectors

effectively incorporate a safety mechanism to avoid over-proliferation of TERT expressing cells.

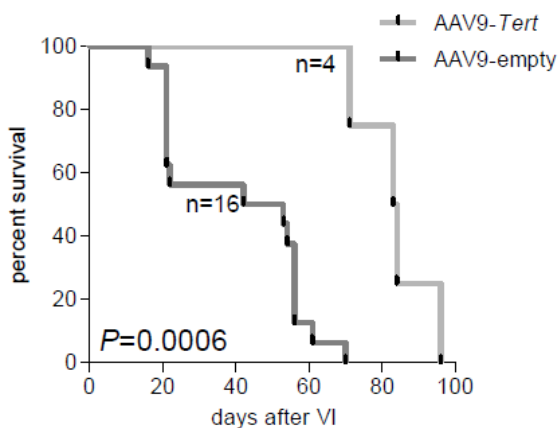
Intellectual property

Patent title :

“TELOMERASE REVERSE TRANSCRIPTASE-BASED THERAPIES”

Applicant: Spanish National Cancer Research Center (CNIO) and Universitat Autònoma de Barcelona (UAB).

This patent EP3848056 (A1) is a European divisional application



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A pharmaceutical composition for use in the treatment or prevention of cancer and/or metastasis

The CNIO has developed a pharmaceutical composition for use in the treatment or prevention of cancer and/or metastasis, for example, in combination with immunotherapy; and an early metastasis prognostic method for a subject afflicted with cancer.

Industrial partners are being sought to collaborate through a patent license agreement for the development and exploitation of the technology.

Description

The inventors have developed a pharmaceutical composition for use in the treatment or prevention of cancer and/or metastasis. The invention also refers to a novel early metastasis prognostic method. For example, the cancer is melanoma or the metastasis is from melanoma. The invention also relates to a pharmaceutical composition to increase the efficiency of immunotherapy and for use in the prevention of lymphangiogenesis.

Main innovations and advantages

The pharmaceutical composition of the present invention presents several advantages over existing therapies. Current melanoma treatments address against proteins which reduce tumor growth, but still a wide number of melanoma patients acquire resistance to these therapies and develop more aggressive relapses that coexist with the development of metastasis.

The present invention targets a protein involved in invasion, metastasis and cancer stem cells.

Therefore, the composition of the invention inhibits metastatic spread of cancer, for example, of melanoma, which is still the main cause of death for this disease. The specific targeting also represents an advantage over therapies such as general chemotherapies or radiation therapy and to immunotherapy resistant tumors.

Intellectual property

Patent title :
THX-B FOR TREATING AND PREVENTING
CANCER AND METASTASIS

Applicants:

Spanish National Cancer Research Center
(CNIO) and Mr. Horacio Uri Saragovi

International patent application:

WO2023/002008 (A1)

Patent application suitable for entering
national/regional phase

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HIGHLY SELECTIVE RET KINASE INHIBITION

The CNIO has developed *in vitro/in silico* screening methods for compounds which inhibit RET kinase activity.

Industrial partners are being sought to collaborate through a patent license agreement for the development and exploitation of the technology.

Description

The inventor has found a cryptic sub-pocket in proto-oncogene tyrosine-protein kinase receptor RET as a key structural determinant for efficient and selective RET kinase inhibition.

Main innovations and advantages

The identified cryptic pocket, called the post-lysine pocket, has important consequences on RET tyrosine kinase activity. The identification of the post-lysine pocket as a new druggable vulnerability in the RET kinase exploited by second generation RET inhibitors allows the screening of compounds and also drug design and the development of personalized therapies for patients with RET-driven cancers.

The present invention refers to a method of screening for a compound capable of inhibiting the tyrosine kinase activity of RET, to a compound that binds to at least one of RET's amino acids identified by the inventor, to the use of said compound to inhibit RET, to a RET polypeptide and nucleic acid with mutated sequence, and to a method for modifying compounds to inhibit RET.

Intellectual property

Patent title:

IDENTIFICATION OF A CRYPTIC AND DRUGGABLE POCKET IN THE ACTIVE SITE OF RET WITH THERAPEUTIC POTENTIAL: THE POST-LYSINE POCKET

Applicants:

Spanish National Cancer Research Center (CNIO)

International patent application:

WO2023/052462 (A1)

Patent application suitable for entering national/regional phase

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FAECAL MICROBIOTA SIGNATURE FOR PANCREATIC CANCER

The CNIO has developed a method for early detection of pancreatic cancer.

Industrial partners are being sought to collaborate through a patent license agreement for the development and exploitation of the technology.

Description

The inventors have found a method for early diagnosing pancreatic cancer based on a faecal microbiota signature with high specificity for pancreatic cancer.

Main innovations and advantages

The method of the invention is a sensitive, specific and non-invasive method for an early detection of pancreatic cancer, in particular Pancreatic Ductal Adenocarcinoma (PDAC) that could therefore improve survival outcomes.

The present invention refers to a method for diagnosing pancreatic cancer in a subject comprising determining the abundance of several Microbiome species in a faecal sample from said subject, as well as to a kit and its use for the diagnosis of pancreatic cancer.

Intellectual property

Patent title:

FAECAL MICROBIOTA SIGNATURE FOR PANCREATIC CANCER

Applicants:

Spanish National Cancer Research Center (CNIO) and European Molecular Biology Laboratory (EMBL)

International patent application:

WO2023/052486 (A1)

Patent application suitable for entering national/regional phase

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