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Comunidad de Madrid
Dirección General de Investigación e Innovación Tecnológica
CONSEJERÍA DE CIENCIA, UNIVERSIDADES E INNOVACIÓN

CATALOGUE

Health Sciences

Scientific and Technological Offer

Health sciences

- Estimated energy model based in quantitative structure-activity relationships (3D QSAR)
- Anticancer activity of ru (II) arene complexes complexes with oxime ligands
- Pyridazino[2,3-A]pyrrolo[2,1-C]quinoxalinium salts for the treatment of leishmania infections and diseases that involve the protein tyrosine phosphatise 1B
- Technoligies for the improvement of the mobility of people with motor affectation
- Walker for the mobility of people with motor disability
- Location system and navigation assistance for blind people, using artificial vision
- Device and method for ventricular repolarization alternans detections by windowing
- New therapeutic agents for the treatment of inflamatory disorders
- Double port injector to corneal transplant DMEK
- Carbosilane dendrimers with polyphenolic groups. Uses as antioxidants and anticancer
- Method of diagnosis of non-invasive renal failure and prior to symtoms and functional disorders
- New inhibitor compounds of the tyrosine phosphobase 1B protein
- Carbosilane dendrimers and their use as antivirals
- Carbosilane dendrimers with a polyphenolic nucleus and their use as antivirals
- Derivates of indolin-2-one and its therapeutic use in inflammatory, autoinmune, metabolic, cardio-vascular, neurological, and cancer diseases
- Carbosilane dendrons functionalized with fatty acids: formation of micelles and uses in biomedicine as antiviral, antibacterial, antiprionic, antimicrobial and drug transporters
- Nanoconjugates formed by dendritic molecules and peptides as antitumor agents against advance prostate cancer
- Compounds for the treatment of leishmania infections
- Carbosilane metallodendromers containing ruthenium and copper ions coordinated to schiff base ligands, their preparation and us
- Drug formulation and biodisponibility

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ESTIMATED BINDING ENERGY MODEL BASED IN QUANTITATIVE STRUCTURE-ACTIVITY RELATIONSHIPS (3D QSAR)

TECHNOLOGY OFFER

Code

BIO_UAH_01

Application areas

- Biological Sciences

Type of collaboration

- Technical cooperation
- Commercial agreement with technical assistance

Main researches

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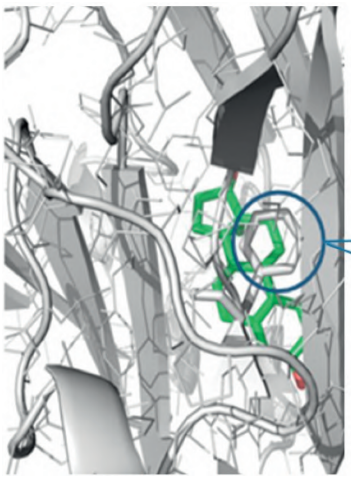

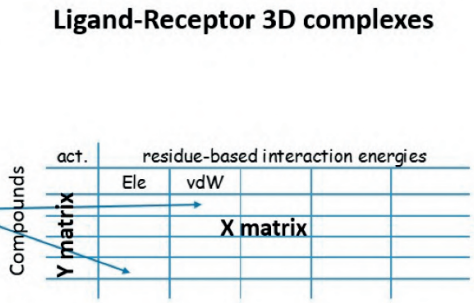

ABSTRACT

The biological activity of a compound depends greatly on its interaction energy with the receptor and so the accurate estimation of the compound's interaction energy is really important to predict a priori the activity of novel compounds before their synthesis. Unfortunately, even knowing the structure of the compound, the interaction is difficult to estimate.

To solve problems with series of interrelated compounds, a simpler model of interaction energy and its molecular mechanism can be built. This model called COMBINE (Combine Binding Energy) analysis is mainly based on the 3D QSAR method (Quantitative Structure-Activity Relationships) which uses receptor-ligand complex structures. The receptor-ligand interaction energy is computerized in AMBER molecular modelling programs. Residual contributions were considered with estimations of the electrostatic contribution of the ligands and receptors desolvatation with biological activity, using a continuous method. Due to the regression analysis PLS (Partial Linear Least Squares Regression Analysis) all the energy values relate to the biological activity.

ADVANTAGES AND INNOVATIONS

One of the most important competitive advantage is the possibility to predict and evaluate the interaction energy of a new compound with its biological target before its synthesis, as well as the possibility to quantify the structure-activity relations in analogous series. Equally, it is possible to build, visualize and optimize molecules with pharmacologic potential and to model by homology macromolecular structures which are still not experimentally available.

- Combine Binding Energy (COMBINE) is used to determine the effect of incorporating the dissolvent.
- It is used as a powerful design tool in receptor drugs.
- COMBINE could determine the electrostatic contribution to binding free energy between a ligand (L) and a receptor to form the complex L-R in the presence or in the absence of a dissolvent.

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ANTICANCER ACTIVITY OF RU (II) ARENE COMPLEXES WITH OXIME LIGANDS

Patent
ES2533653

Code

BIO_UAH_07

Application areas

- Biological Sciences, Health and Pharma

Type of Collaboration

- Technical cooperation
- Commercial agreement with technical assistance
- License agreementt

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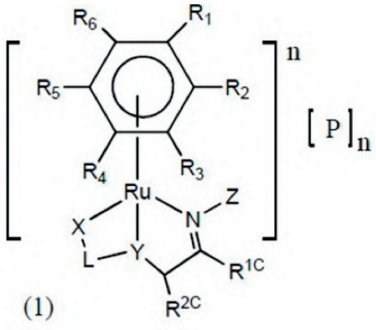

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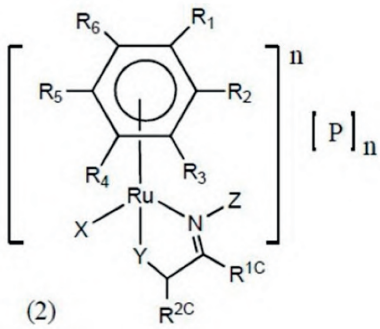

(2)

ABSTRACT

The invention describes the efficient antitumor activity of Ru (II) complexes and their enhanced cytotoxic action relative to that found for the organic and inorganic starting products.
The complexes studied show an excellent antitumor activity against the human prostate adenocarcinoma cell line, with a dose of 10-15µM at short incubation times (3 hours). They have also demonstrated antimetastatic capacity in adhesion and migration in vitro tests.
The synthetic reactions leading to the ruthenium compounds occur in mild conditions of pressure and at room temperature. The complexes are stable and soluble in aqueous media.
The complex subject of this study are derivatives of the formulas (1) and (2) (additional information), or solvates or precursors of them.
For (1) and (2), from R1 to R6 may be halide, H may be alkyl or aryl functionalized or without being functionalized. R1 and R2 may also be part of a saturated or unsaturated carbon or heterocyclic ring of 3 to 8 members. P is a contra anion. The n may be 0, 1 or 2. The Z may be OH or OR. RC1 and RC2 may be H, alkyl, alkenyl or linear or branched, cyclic, heterocyclic or acyclic alkynyl, each of these may be or may not be differently substituted by each other.

ADVANTAGES AND INNOVATIONS

- The complexes described herein have high cytotoxicities after only 3 hours with IC50 not exceeding common levels. Also present antimetastatic capacity in in vitro assays adhesion and migration.
- The complexes are stable and soluble in aqueous media, thereby facilitating an easy release and distribution in the biological environment. Furthermore, these properties allow synthesis reactions to be carried out using low cost technologies.
- The complexes studied are obtained from simple synthesis reactions, using natural non-oil products such as terpenes, which are renewable, cheap and easily modifiable.
- Excellent, fast-acting in vitro antitumor properties. Can be used as drug for cancer treatment or prevention.

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PYRIDAZINO[2,3-A]PYRROLO[2,1-C]QUINOXALINIUM SALTS FOR THE TREATMENT OF LEISHMANIA INFECTIONS AND DISEASES THAT INVOLVE THE PROTEIN TYROSINE PHOSPHATISE 1B

Patent
ES2537221

Code

BIO_UAH_10

Application areas

- Biological Sciences, Health and Pharma

Type of Collaboration

- Technical cooperation
- Commercial agreement with technical assistance
- License agreementt

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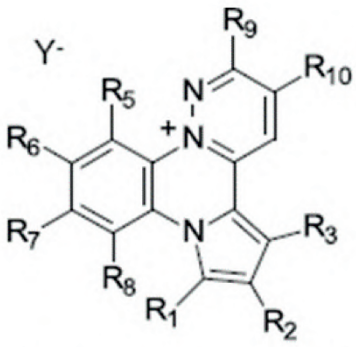

Estructura de nuevos compuesto de Fórmula I

ABSTRACT

The invention relates to the preparation of new compounds of Formula I as well as to the uses of these compounds to inhibit the growth and infection of the Leishmania parasite, which is an important new tool from the medical and veterinary point of views.
The invention also relates to the use of these compounds to inhibit PTP1B (protein belonging to the family of protein tyrosine phosphatases, PTPs).
The composition comprises at least one of the compounds of the invention together with a pharmaceutically acceptable carrier. The use of this composition for the treatment of infectious diseases is as a therapeutically effective amount. It can be prepared as a solid or aqueous suspension, in an acceptable pharmaceutically solvent and may be administered by a suitable administration route. The compounds of the invention are prepared from pirroloquinoxalines.
It can be used for the treatment of insulin resistance, glucose intolerance, obesity, diabetes mellitus, hypertension and ischemic diseases. Moreover, these compounds can be used in the treatment of cancer, osteoporosis, neurodegenerative and infectious diseases, and diseases involved with inflammation and the immune system.
The present invention also concerns the use of these compounds for the treatment of renal failure, myocardial infarction, ischemia, multiple sclerosis, neurodegenerative diseases or infectious diseases such as leishmaniasis.

ADVANTAGES AND INNOVATIONS

- High specificity for the Leishmania parasite.
- Possible new therapy for diabetes and obesity.
- As leishmanicidal, these compounds are highly selective. They can be used with other pharmaceuticals or additional active principles to provide a combination therapy.

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TECHNOLOGIES FOR THE IMPROVEMENT OF THE MOBILITY OF PEOPLE WITH MOTOR AFFECTATION

Patent
ES1138935 U
and
ES1104783 U

Code

BIO_UAH_11

Application areas

- Information and Communication Technologies
- Other Industrial Technologies
- Biological Sciences

Type of Collaboration

- Technical cooperation
- Commercial agreement with technical assistance
- License agreementt

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Fig. 1: Andador

Fig. 2: Silla de ruedas eléctricas

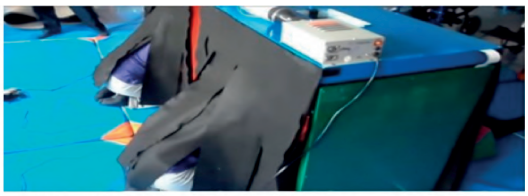

Fig. 3: Cabina multisensorial portátil

ABSTRACT

Walker for the improvement of the mobility of people with some motor affectation. This walker incorporates a guide for the legs that improves the maneuverability of the users, and also is accompanied by an electronic that allows the configuration of basic actions. The walker can be adjusted to the height of the child, allowing to configure different positions as well as adapting to the different weights of the user. The structu- re is made up of three distinct parts: a structure with wheels that provides stability, a harness with leg brace that supports the child and an electronics that provides fun- ctions added by software.

Portable multi-sensory cubicle that allows users with serious cognitive and / or physical conditions to receive an individualized multisensory stimulation.

It is easy to transport and store, and its structure of felts can isolate relatively the user. In this way, different methods of multisensory activation of the user are combined in an integrated way, providing him with auditory, optical and tactile stimulus.

The cubicle contains folding panels, felt pieces or opaque fabrics, an exterior decoration for tactile stimulation of the user, as well as an opening in one of the sides of the structure that allows to incorporate a tablet or digital device for the visual stimulation of the user. At the same time this tablet can be connected to a control electronics allowing amplification of the sound to act on the speakers and LEDs inside the cubicle. In addition, it is possible to interconnect several multi-sensory cubicles, just in case that it is desired to increase the size of the cubicle.

Electric wheelchair for children between 2-5 years of small size that allows the child to sit. It is characterized by its small size and it is easy to disassembly. It is supported on two axles with wheels, housing in the rear axle two electric motors that allow the mobility of the chair. In addition, the structure allows to accommodate the system of power batteries and a joystick that allows its control.

ADVANTAGES AND INNOVATIONS

- **Walker**: This walker allows to rotate in a relatively normal form, without forcing the patient to make exaggerated movements with the feet. For this, it contains guides in the design that transmits the lateral displacement almost immediately to the structure of the walker, as well as a development based mainly on flat pieces.
- **Electric chair**: The developed electric chair tries to cover the existing gap in this type of products for young children, on the other hand it has been complemented with a design that allows to place the Joystick in the front to be handling by the child or in the back to be controlled by an adult accompanying the child. On the other hand the bar that supports the Joystick can be removed to approach the classroom chair.
- **Multisensory cubicle:** The multi-sensory cubicle combines in a very small space the possibility of performing visual, auditory and tactile stimulation so that they can be combined in an individualized treatment room either for postural changes, for relaxation or for stimulation.

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WALKER FOR THE MOBILITY OF PEOPLE WITH MOTOR DISABILITY

Patent
ES1104783 U

Code

BIO_UAH_12

Application areas

- Information and Communication Technologies
- Other Industrial Technologies
- Biological Sciences

Type of Collaboration

- Technical cooperation
- Commercial agreement with technical assistance
- License agreementt

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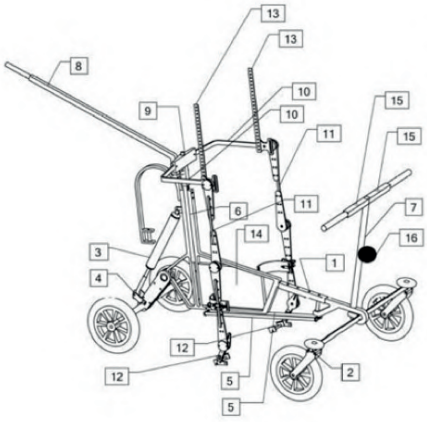

Figura 1

ABSTRACT

This walker includes a guide for the leg together with an electronic system that improves the user of manoeuvrability allowing the configuration of basic actions. Different machining processes and electronic development techniques are involved, supplementing its main functionality. The device of the invention consists of two different parts:

1) Wheeled structure providing stability
This structure has bars allowing the slippage of some elastics through them to facilitate reciprocal movement. This structure which provides the necessary stability has a support where the child is sitting. The walker can be adjusted to the child's height allowing to set different positions and to adapt to different user weights. The structure also carries a front bar where the child can support the hands and another one in the back allowing the adults take the child.

2) Harness with braces to support the child
Some braces are hanging from the harness allowing movements of feet, legs and hips. These articulated bars also support much of the children weight adapting the structure to their height in the growth stage.

ADVANTAGES AND INNOVATIONS

- It is not necessary to perform exaggerated movements in the feet, because the walker contains a design modification transmitting the lateral displacement almost immediately to its structure, as well as a development based on flat pieces.
- Production more economic obtained by the construction of wheeled structure with flat surfaces: the pieces are cut by a flexible cut mechanism such as waterjet or laser, therefore the most of the pieces are flat and they do not need subsequent machining.
- This structure has bars allowing the slippage of some elastics through them to facilitate reciprocal movement. These bars are joined to the child's ankles in the anteriorly part and others placed higher in the rear part to facilitate this movement.

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LOCATION SYSTEM AND NAVIGATION ASSISTANCE FOR BLIND PEOPLE, USING ARTIFICIAL VISION

Patent
ES2447641

Code

BIO_UAH_13

Application areas

- Information and Communication Technologies
- Biological Sciences

Type of Collaboration

- License agreement

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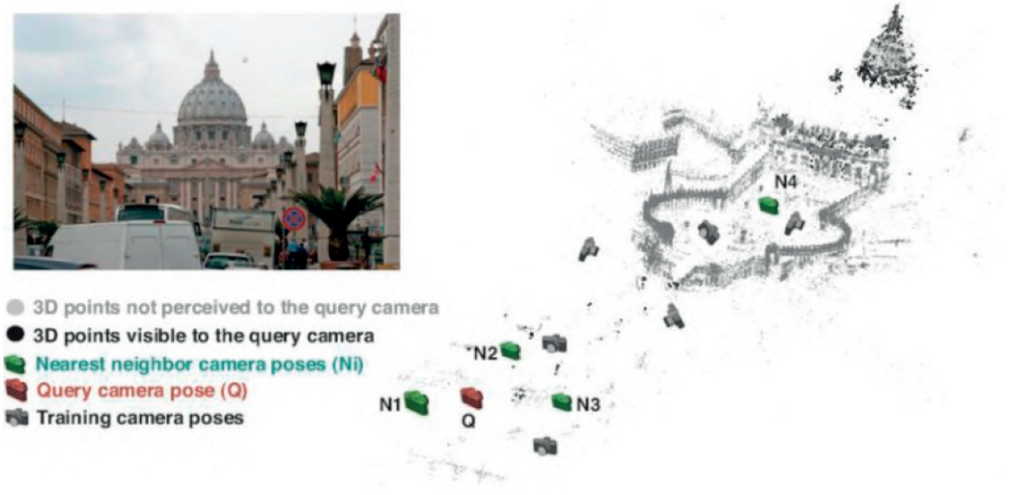

ABSTRACT

Navigational system for blind people sufficiently robust and simple to use that lets obtain an accurate location of the user in a known or unknown environment, both indoors and outdoors location. In this way the system will indicate the path that a person must follow to get to a destination, using acoustic information obtained by a voice synthesizer, similar to how the current GPS navigators do it. To this end, a method of locating and learning will be used, inspired in how human beings use visual capacity.
The location and environment mapping are two dependent processes that are calculated while the user navigates through it. The techniques are called SLAM (Simultaneous Localization and Mapping) and in recent years they have extended their application in the field of robotics and other emerging fields such as locating for blind people or surgery minimally invasive.
As a result of the great advances in research on object recognition using artificial vision, computers are able to recognize places such as monuments, or identify different objects in an image, such as faces or people, just by analyzing a single image. More and more, computers can develop similar tasks to the human vision.

ADVANTAGES AND INNOVATIONS

- It is the first system worldwide that presents the use of visual maps obtained by a stereo camera for navigation assistance to blind people, using visual information. It is an evolution of the SWAN Project (System for Wearable Audio Navigation) developed by the Georgia Institute of Technology, Atlanta, United States.
- In the near future the system is likely to be commercially exploited by institutions and companies in a variety of fields such as: assistance to the blind navigation, augmented reality, video games, humanoid robots, etc.
- The system has been successfully tested in the navigation assistance of humanoid robots and in a basic version with real blind people in the center of Madrid and Alcala de Henares.

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DEVICE AND METHOD FOR VENTRICULAR REPOLARIZATION ALTERNANS DETECTION BY WINDOWING

Patent
ES343054 B2

Code

BIO_UAH_15

Application areas

- Information and Communication Technologies
- Other Industrial Technologies
- Biological Sciences, Health and Pharma

Type of Collaboration

- Technical cooperation
- License agreement
- Commercial agreement with technical assistance

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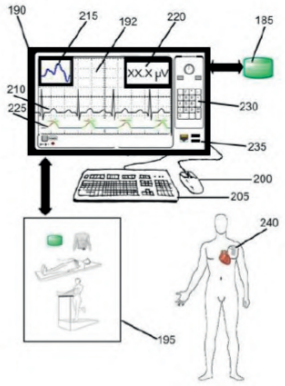

ABSTRACT

The designed scheme consists of the following:

1. Extraction and / or storage of the electrocardiogram (ECG)
2. Adaptation of the signal and elimination of noise and artifacts
3. Extraction of information of T-wave alternans (TWA) using the synthesis of a periodical window and the windowing of the signal
4. Post-processing for improving TWA detection
5. Detection of TWA from RAOT calculation and decision
6. Presentation of the results for estimating the TWA may be one or more of the following:
   - The Value of the power estimation, which may be in voltage units
   - Superposition of ventricular repolarization in order to visually identifying alternans
   - The estimated waveform of the alternating wave
7. Output Interface that transmits information to a user, to another processing stage or a device, about the existence or nonexistence of TWA in the signal.

ADVANTAGES AND INNOVATIONS

- The ECG is processed in the time domain.
- It is based on spectral analysis, using the ECG as an original signal sin the analysis.
- A small number of heart beats is used in the analysis, from 8 to 32.
- It is robust against noise, being valid for the analysis of any type of electrical signal of the heart from any existing device, like Holter monitoring long term, signals from exercise testing, cardiac monitoring devices or intracavitary signals from electrophysiological studies or implantable devices.

Using a reduced number of beats in the analysis:

- The variability effect of heart rate decreases.
- The resolution of the analysis improves.
- The computational cost is reduced, making it valid for implementation into any existing device, including portable or implantable devices.

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NEW THERAPEUTIC AGENTS FOR THE TREATMENT OF INFLAMMATORY DISORDERS

TECHNOLOGY OFFER

Code

BIO_UAH_17

Application areas

- Biological Sciences

Type of collaboration

- Technical cooperation
- License agreement

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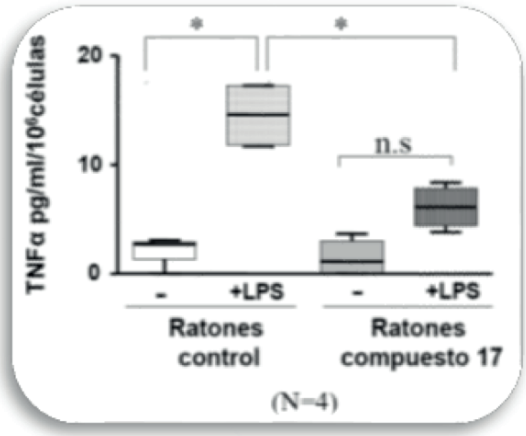

ABSTRACT

New inhibitors of TNF-α production are useful to prevent and/ or treat inflammatory diseases such as rheumatoid arthritis, osteoarthritis, Crohn disease, ulcerative colitis, asthma,bronchitis, chronic obstructive pulmonary disease, psoriasis, allergic rhinitis, ankylosing spondylitis, Hidradenitis suppurative, dermatitis and any other state with TNF-α high levels.

This compounds are capable to inhibit TNF- alpha expression at transcriptional level in primary human monocytes, what suggests that the mechanism could be related with some transcription factor and could regulate also the expression of additional citokinins. The effect seems to be apart independent from p38 MAPK or c-jun activation. The preliminary data suggest that NF-κB activity could be affected.

Besides TNF-α, these compounds also regulate the low production of of IL-1β y de IL-6 in THP-1 cells stimulated with LPS. The response to additional inflammatory stimulus has been explored such as poly I:C (ssRNA analogous) and the results show that this compounds also inhibit the TNF-α production and IL-12 response to stimulation with poly I:C in dendritic human cells differentiated in vitro.

Since metabolic diseases are related to low degree s inflammation, the action of those new inhibitors has been explored in mature human adipocytes produced in vitro from mesenchymal stem cells. The results show a lower regulation that depends on IL-6 production and leptin in human adipocytes stimulated with LPS.

In vivo studies in animal models, previous treated with low doses of this compounds, exhibit significantly lower TNF- alpha production when are subjected to powerful pro-inflammatory stimuli such us LPS. This result indicates that the compounds present anti-inflammatory effectivity when are administrated in vivo.

In relation to safety, long term treatment in mice with low doses of this compounds present absence of kidney, lung or liver toxicity.

ADVANTAGES AND INNOVATIONS

- Less secondary effects than steroidal anti- inflammatory drugs (hormones) and non steroidal anti- inflammatory drugs (NSAIDs) used nowadays.
- Oral administration.

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DOUBLE PORT INJECTOR TO CORNEAL TRANSPLANT DMEK

Patent
ES2395681 B1

Code

BIO_UAH_18

Application areas

- Biological Sciences, Health and Pharma

Type of Collaboration

- Technical cooperation
- License agreement

Main Researchers

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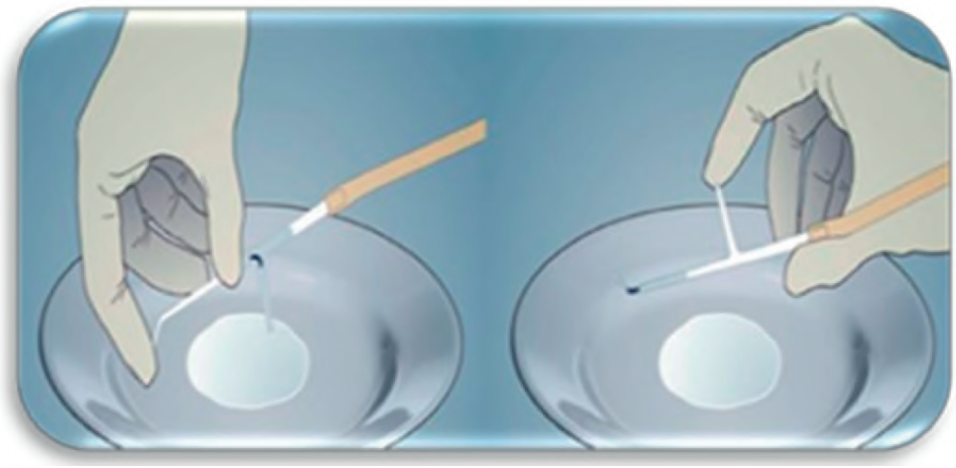

ABSTRACT

A Corneal Endothelium Inyector with two asymmetric and separate entrances ways. The entrance with a wider lumen is used to graft insertion without friction. The entrance with thinner lumen, located in the injector s tip, has been designed for the controled exit of the endotellium through a minimal incision.
This double port design allows to reduce the compression that affects the graft when it goes in through the port, unlike what it happens with injectors with one entrance, where the graft has to be compress to pass through the same track that uses to go out, increasing the friction.
The use of a closed system allows to vacuum the graft without touching it, besides with this invention it is unnecessary the use of viscoelastic agents that could interfere with the adhesion of the graft inside the eye.
All the process takes place continuously, there's no need to disable the injector from the aspiration/suction system, like happens with other injectors now in the market.
The injector is made in crystal to prevent adhesions and reduce the graft friction with the walls.

ADVANTAGES AND INNOVATIONS

- The main difference of this invention against other models nowadays in the market, is that it presents a double port with asymmetric lumen to separate the way of entrance and the way out. That will also reduce the graft compression when going through the injector. This is main difference with the one line injectors that share entry and exit.
- The injector is made in crystal to reduce adhesion and friction with the walls compared to plastic injectors.
- Both ports are separated and independent from de suction system, which makes the whole process take place continuously without need of disassemble the injectors from the aspiration system.

In conclusion, this new design try to diminish the endothelial damage during corneal endothelial graft implantation in eye s anterior chamber.

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CARBOSILANE DENDRIMERS WITH POLYPHENOLIC GROUPS. USES AS ANTIOXIDANTS AND ANTICANCER

Patent
ES2543640

Code

BIO_UAH_21

Application areas

- Biological Sciences
- Agrofood Industry
- Pharmaceutical and Cosmetics

Type of Collaboration

- Technical cooperation
- Comercial agreement
- License agreement

Main Researcher

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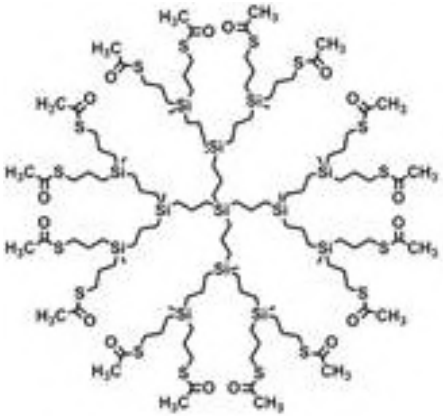

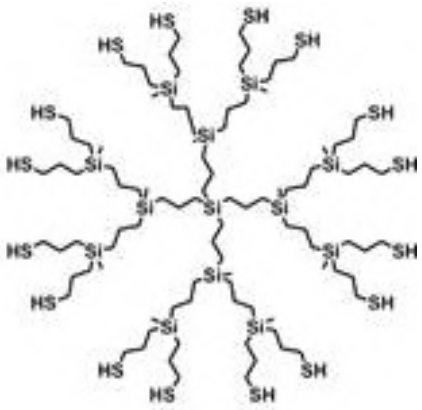

ABSTRACT

The present invention gives rise to highly branched dendritic macromolecules synthesized from a polyfunctional nucleus, called dendrimers, of carbosilane structure, that is, they contain in their structure silicon-carbon bonds and functionalized in their periphery with thiol groups. In addition, the invention provides a process for obtaining them and their uses as antioxidants.

The dendrimers of the invention can have application in different fields such as cosmetics, among which its use as antioxidants is worth mentioning since they can protect products that are particularly sensitive to oxidation. For example, in hair care compositions such as shampoos, lotions, gels, emulsions or hairsprays, which can be applied before or after different hair treatments, such as dyeing, wicks, hair discoloration, as well as permanent or smoothed among others.

They can also be used as antioxidants in skin care products or makeup products, in mascara for lashes and eyebrows, anti-aging creams, lengthening the durability of lipsticks, eye shadows, blushers, eyeliners or nail polish. Also in the care of the skin as constituents of lotions, creams and milk cleansing.

ADVANTAGES AND INNOVATIONS

- Respond predictably in solution
- They can be extensively modified to carry multiple ligands with biological activity
- They can cross biological barriers
- Dendrimers are multivalent systems that allow the incorporation of multiple functionalities-SH on the surface of a single molecule increasing the concentration of active centers per molecule and therefore enhancing the antioxidant capacity of the system
- In addition, they can be used as anchoring platforms for different molecules through click chemistry processes such as the addition of thiolene
- The commercial thiol derivatives used in cosmetics have the inconvenient of the characteristic bad smell of the compounds with sulfur, while in the dendrimers referred to in this invention, that odor is much less intense, being more pleasant its use

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METHOD OF DIAGNOSIS OF NON-INVASIVE RENAL FAILURE AND PRIOR TO SYMPTOMS AND FUNCTIONAL DISORDERS

TECHNOLOGY OFFER

Code

BIO_UAH_22

Application areas

- Life Sciences, Medicine, Pharma

Type of collaboration

- Technical cooperation
- Commercial agreement with technical assistance
- License agreement

Main researches

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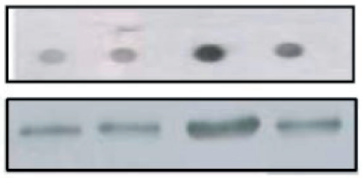

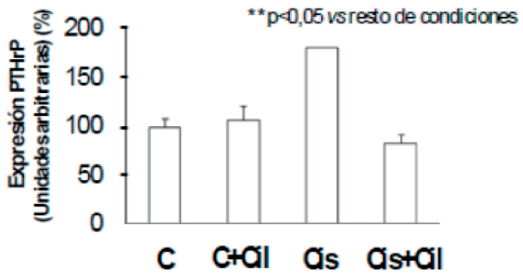

ABSTRACT

Renal disease can be acute or chronic and both progress with Renal Insufficiency (RI) and ultimately death.

In recent years the search and identification of new RI biomarkers molecules, particularly in urine, has intensified.

The invention describes the diagnosis of acute or chronic Renal Insufficiency by urinary quantification of the protein related to Parathyroid Hormone PTHrP, comparing that amount with at least one reference value and diagnosing RI based on that comparison. PTHrP is normally undetectable in organic fluids of a healthy individual, so that its mere presence already serves as a marker of disease. Thus, the finding of an increased urinary PTHrP value in comparison to the value found in healthy individuals results in a biomarker indicative of acute or chronic IR.

The most viable method is to analyze urine samples using Western Blotting of proteins using a specific monoclonal antibody that recognizes the protein related to Parathormone (PTHrP). The presence of a single band, in addition to demonstrating the specificity of the methodology used, allows to use a simpler detection technique such as the dot blot.

In order to quantify the above analysis, a preferred embodiment of the method of the invention is that the reference value is obtained from a control sample. And that the individual from which the urine sample is taken is a mammal, preferably a human.

ADVANTAGES AND INNOVATIONS

The biomarker described has the following major clinical advantages over other known biomarkers:

- The method only requires the analysis of an isolated sample of urine to make possible the diagnosis of RI.
- While the diagnostic utility of known biomarkers in urine is limited to acute renal failure (ARF), this method further allows the diagnosis of chronic renal failure (CRF).
- Since the method described in this invention only requires the analysis of an isolated urine sample, it makes it possible to diagnose acute or chronic RI in isolated samples from patients' urine or in single samples, and even in old urine samples allowing the retrospective diagnosis even in the absence of serum or plasma.
- The presence of a unique band, in addition to demonstrating the specificity of the methodology used, allows the use of a simpler detection technique such as the dot blot.

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NEW INHIBITOR COMPOUNDS OF THE TYROSINE PHOSPHATASE 1B PROTEIN

Patent
ES2522717 B1

Code

BIO_UAH_23

Application areas

- Biological Sciences, Health and Pharma

Type of Collaboration

- Technical cooperation
- License agreement
- Commercial agreement with technical assistance

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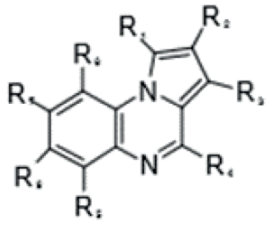
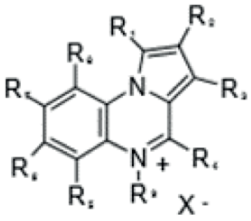


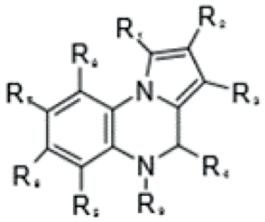
I

Fig. 1



II

Fig. 2



III

Fig. 3

Figure 1, 2 and 3.- View of the structure of new compounds of Formula I, Formula II and Formula III

ABSTRACT

The invention describes the presentation of three families of compounds with inhibitory activity on protein tyrosine phosphatase B1 (PTP1B). The new compounds of this invention have a structure of pyrroloquinoxaline and pyrroloquinoxalinium, never before used in the inhibition of PTP1B.
The present invention is related to the field of chemical synthesis of new compounds and their use as inhibitors of PTP1B, which are useful in the treatment or prevention of diseases in which PTP1B is known to be involved in the pathogenesis
As inhibitors of phosphatase activity and, in particular, as inhibitors of PTP1B, the novel compounds of the present invention can be used for the treatment of insulin resistance, glucose intolerance, obesity, diabetes mellitus, hypertension and ischemic diseases of large and small blood vessels, conditions that accompany type 2 diabetes including dyslipidemia, for example, hyperlipidemia and hypertriglyceridemia, atherosclerosis, vascular restenosis, irritable bowel syndrome, pancreatitis, adipose cell cancer and carcinomas such as liposarcoma, and other disorders where insulin resistance is indicated. In addition, the compounds of the present invention can be used for the treatment of cancer, osteoporosis, neurodegenerative and infectious diseases, and diseases involved with inflammation and the immune system.

ADVANTAGES AND INNOVATIONS

The formulas described in the invention represent a novelty in terms of the inhibition of PTP1B, since they are sufficiently lipophilic allosteric inhibitors, that represents an advantage over the active center inhibitors discovered before, which show a very low bioavailability and which failed in clinical trials.

It presents commercial potential at an international level, focused mainly on the markets of the US, Europe, Australia, Japan and India with reasonable difficulty and cost of implementation.

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Universidad de Alcalá

CARBOSILANE DENDRIMERS AND THEIR USE AS ANTIVIRALS

Patent
ES 2364264 B2

Code

BIO_UAH_24

Application areas

- Biological Sciences, Biotechnology, Medicine, Health Science

Type of Collaboration

- Technical cooperation
- License agreement
- Manufacturing agreement
- Commercial agreement with technical assistance

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ABSTRACT

Dendrimers are hyperbranched molecules of well-defined three-dimensional size and structure and possessing uniform chemical properties due in part to their low polydispersity. The nature and properties of the dendrimers can be controlled by acting on the core of the dendrimer, on the growth units or branches or on the periphery of dendrimers.

The dendrimers of this invention are of carbosilane and the surface is covered with different anionic groups, which give dendrimers antiviral properties.
The ability of dendrimers to interfere with the virus-cell interaction suggests that they could act as topical microbicides, that is, compounds applied to the vaginal or rectal mucous to prevent sexually transmitted diseases. Therefore, another aspect of the present invention relates to dendrimers as a medicine per se. This medicine being preferably for the prevention and / or treatment of diseases caused by viruses, bacteria or fungi. And more preferably when the disease is caused by strains of HIV.

As antivirals, these dendrimers prevent the correct process of virus adhesion to the target cell, as well as the infection and its corresponding production of new viral particles.

ADVANTAGES AND INNOVATIONS

The anti-inflammatory properties of these dendrimers are additional advantages with respect to other dendrimers with antiviral, antibacterial or antipyretic activity.

In addition to the prophylactic application, they have therapeutic effect especially in sexually transmitted diseases, by preventing the infection of cells not yet infected.
Their preparation as pharmaceutical formula can be very varied, being possible any solid composition (tablets, pills, capsules, granules, etc.) or liquid (gels, solutions, suspensions or emulsions). For oral, nasal, topical or parenteral administration, preferably the administration will be topical.

These dendrimers by themselves have biological activity as antiviral agents. They have in vitro activity against a variety of viruses.

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Universidad de Alcalá

CARBOSILANE DENDRIMERS WITH A POLYPHENOLIC NUCLEUS AND THEIR USE AS ANTIVIRALS

Patent
ES 2364264 B2

Code

BIO_UAH_25

Application areas

- Biological Sciences, Biotechnology, Medicine, Health Science

Type of Collaboration

- Technical cooperation
- License agreement
- Manufacturing agreement
- Commercial agreement with technical assistance

Main Researchers

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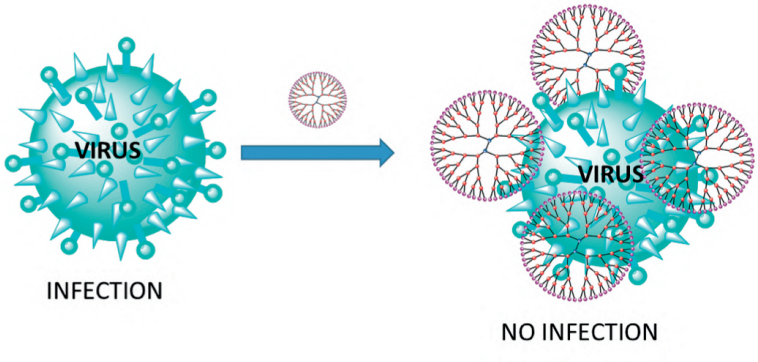

ABSTRACT

Dendrimers are hyperbranched molecules of well-defined threedimensional size and structure and possessing uniform chemical properties due in part to their low polydispersity. The nature and properties of the dendrimers can be controlled by acting on the core of the dendrimer, on the growth units or branches or on the periphery of dendrimers.

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These dendrimers by themselves have biological activity as antiviral agents. They have in vitro activity against a variety of viruses.

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Universidad de Alcalá

DERIVATIVES OF INDOLIN-2-ONE AND ITS THERAPEUTIC USE IN INFLAMMATORY, AUTOIMMUNE, METABOLIC, CARDIOVASCULAR, NEUROLOGICAL AND CANCER DISEASES

Patent
ES2646993

Code

BIO_UAH_26

Application areas

- Biological Sciences, Health Science

Type of Collaboration

- Technical cooperation
- Commercial agreement with technical assistance
- License agreement

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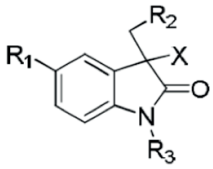
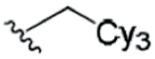


(I)

View of the structure of the compound of Formula I

ABSTRACT

A compound whose base formula (I) is in the image, where O represents a pharmaceutically acceptable salt thereof, wherein X represents hydrogen or halogen; R1 represents hydrogen or halogen; R2 represents phenyl or Cy1 and R3 represents hydrogen or a group of formula:



The compounds of formula (I) and their salts may differ in certain physical properties, but are equivalent for purposes of the invention.
Other aspects of the invention are related to (1) pharmaceutical composition comprising a compound of formula (I) as defined above and one or more pharmaceutically acceptable excipients thereof and (2) use of a compound of formula (I) for the manufacture of a medicament for the treatment of a disease associated with the modulation of the AMPK enzyme, such as autoimmune, inflammatory, cardiovascular, metabolic, neurological and cancer diseases, more preferably where the disease is selected from diabetes type 1 and 2, obesity, inflammation, dyslipidemia, hypertension, hyperglycemia, hypertriglyceridemia, insulin resistance, epilepsy, stroke, Krabbe / Twitcher diseases, Alzheimer's, Parkinson's, Huntington's and cancer, even more preferably where the disease is cancer; and still more preferably where the disease is prostate cancer, breast cancer, pancreatic cancer, uterine cancer and gliomas.
The compounds of formula (I) can exist in different physical forms, for instance, in amorphous form and crystalline forms.
As for the administration of the compounds, this can occur in several formulations: oral, parenteral, nasal, ocular, rectal, and topical.

ADVANTAGES AND INNOVATIONS

- The formulas described in the invention represent a novelty in terms of the modulation of the levels of AMP/ATP optimal concentrations, using derivatives of indolin-2-one, which act as modulators of AMPK, whose decompensation is related to the appearance of metabolic diseases, cancer, etc., which represents an advantage with respect to the products currently in the market.
- The administration of the compounds can be done in several formulations: oral, parenteral, nasal, ocular, rectal, and topical, which significantly improves their use.
- It presents commercial potential at a national and international level, with reasonable difficulty and implementation cost.

Last updated 06/2020

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CARBOSILANE DENDRONS FUNCTIONALIZED WITH FATTY ACIDS: FORMATION OF MICELLES AND USES IN BIOMEDICINE AS ANTIVIRAL, ANTIBACTERIAL, ANTIPRIONIC, ANTIMICROBIAL AND DRUG TRANSPORTERS

Patent
ES2657282 B1

Code

BIO_UAH_27

Application areas

- Biological Sciences, Health and Pharma
- Environment and risk prevention

Type of Collaboration

- Technical cooperation
- Commercial agreement with technical assistance
- License agreement

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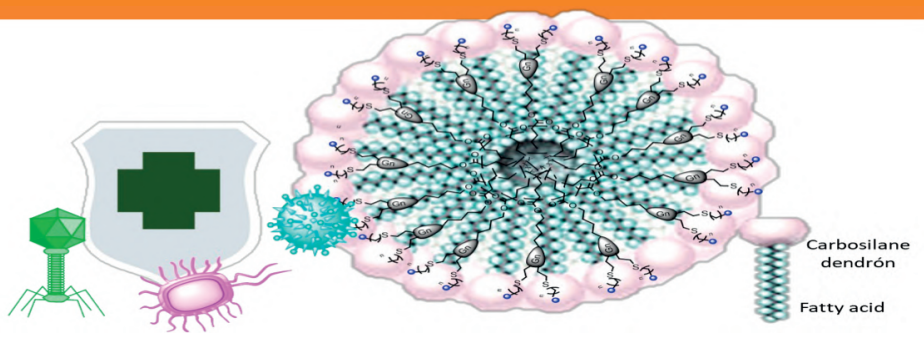

ABSTRACT

The present invention provides compounds formed by dendrons of carbosilane structure that are functionalized in their periphery with anionic groups (such as carboxylate, sulfonate or sulfate), which endow the system with a net negative charge, or cationic (such as ammonium), which endow the system with a positive net charge.

These dendrons present a focal point that contains a hydrophobic function, mainly derived from a fatty acid. The fatty acid is linked to the dendron preferably through an ester bond, without dismissing other bonds, or even through electrostatic interactions.

The patent also includes the preparation of Janus type dendrimers, which are characterized by being formed by two dendritic units that have some distinct structural feature.

And finally, the invention includes the ability of the described compounds to form micelles. The principal medium for its formation would be aqueous but micelles can also be formed in solutions containing soluble salts in these media or surfactants.

Regarding the uses in biomedicine of these compounds and the micelles formed by them, it is worth highlighting: their use as non-viral transport agents for the transfection or internalization of nucleic material within different cell lines in gene therapy processes; use of these compounds as "per se" therapeutic agents, e. g. as antiviral, antimicrobial or antipyretic agents, or as drug transporters, even for the preparation of a drug of solid or liquid composition and oral, nasal, topical or parenteral administration.

In their environmental application, they can be used as biocides to prevent the appearance of microorganisms on surfaces or water treatment.

ADVANTAGES AND INNOVATIONS

- These systems are able to overcome some of the difficulties that certain drugs found, increasing their solubility and even acting as transporters to the areas of interest.
- Ease of diffusion of dendrimers through biological barriers, and therefore access to target cells.
- Possibility of encapsulation and transport of drugs or other molecules with biological activity.
- The preparation of these dendrimers as pharmaceutical formula can be very varied, being possible any solid composition (tablets, pills, capsules, granules, etc.) or liquid (gels, solutions, suspensions or emulsions). For oral, nasal, topical or parenteral administration.

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Universidad de Alcalá

NANOCONJUGATES FORMED BY DENDRITIC MOLECULES AND PEPTIDES AS ANTITUMOR AGENTS AGAINST ADVANCED PROSTATE CANCER

Patent
ES2677242 A1

Code

BIO_UAH_28

Application areas

- Biological Sciences, Health and Pharman

Type of Collaboration

- Technical cooperation
- License agreement
- Commercial agreement with technical assistance

Main Researchers

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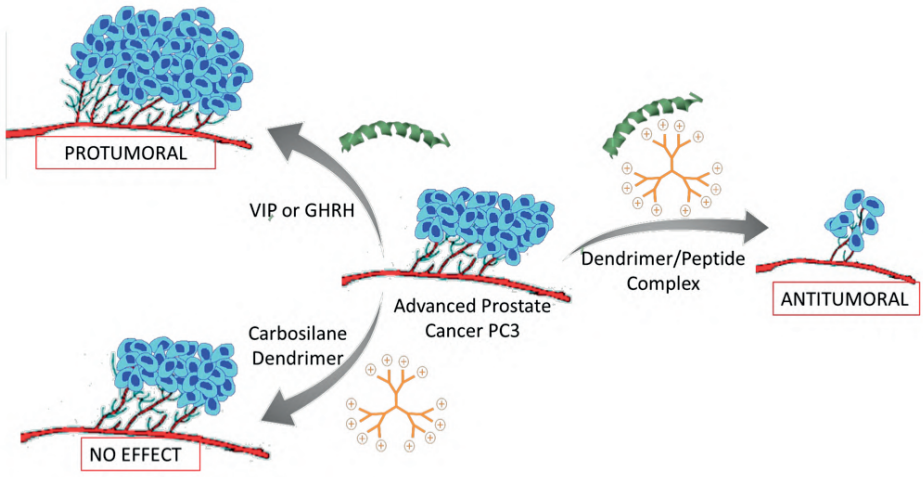

ABSTRACT

The treatment of advanced prostate cancer is nowadays only palliative. In this stage, it is androgen-independent and, unfortunately, is even favored by several human neuropeptides, as vasoactive intestinal peptide (VIP) and growth hormone-releasing hormone (GHRH). The present invention provides the preparation of active nanoconjugates against advanced prostate cancer and to prevent metastasis.

These systems are formed by dendritic molecules and neuropeptides. Preferably, the dendritic macromolecules are of carbosilane structure, mainly with cationic functions in the periphery, and the neuropeptides are of the glucagon / secretin family, mainly VIP, GHRH and PACAP.

The present invention also relates to the biomedical uses of the peptide/dendritic molecule combinations, preferably for the development of drugs for the treatment of advance prostate cancer. However, other types of cancers are not excluded.

ADVANTAGES AND INNOVATIONS

- The properties of nanoconjugates allow treating tumor cells of advance prostate cancer.
- Dendritic systems can be used as transporters of drugs or antitumor nucleic acids due to their ability to be absorbed "in vivo" in tumor zones and to internalize the treatment in cancer cells.
- The dendrimer also remains in the tumor zone without returning to the bloodstream.
- The necessary development, for the commercial exploitation of this patent, does not entail a high technical difficulty.

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COMPOUNDS FOR THE TREATMENT OF LEISHMANIA INFECTIONS

Patent
ES2526935 B2

Code

BIO_UAH_30

Application areas

- Biological Sciences, Health and Pharma

Type of Collaboration

- Technical cooperation
- License agreement
- Commercial agreement with technical assistance

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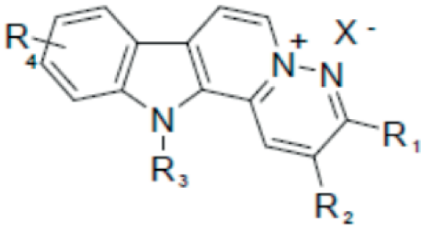

I

Estructura de nuevos compuestos de Fórmula I

ABSTRACT

Preparation and uses of a series of compounds that act as bioactive agents against the Leishmania parasite and as therapeutic agents in the treatment of this disease, in both, its visceral (LV) version and in the mucocutaneous one (CML).
The preparation and use of the structures of pyridazino [1 ', 6': 1,2] pyrido [3,4-b] indolinium salts presented can be an interesting solution for the treatment of the disease, the infections caused by the parasite and to inhibit the growth of this one.
The present invention relates to a pharmaceutical composition comprising at least one of the compounds of the invention, together with a pharmaceutically acceptable vehicle.
The pharmaceutically acceptable adjuvants and vehicles that can be used in said compositions are the adjuvants and vehicles known to those skilled in the art and commonly used in the preparation of therapeutic compositions.

ADVANTAGES AND INNOVATIONS

- The compounds of the invention produce less toxicity and fewer side effects in the patient.
- The compounds of the invention are pharmaceutically acceptable salts, prodrugs and/or solvates, as well as pharmaceutical compositions containing them. They can be used together with other drugs, or additional active ingredients, to provide a combination therapy.
- This new result has good specificity for the Leishmania parasite and would be a competitive advantage for that pharmaceutical company that would manufacture an active ingredient for the formulation of a leishmanicidal drug.
- Given the similarity of the different species of Leishmania, the compounds of the invention are used for the treatment of any type of leishmaniasis. Both visceral (LV) and mucocutaneous (LMC).
- The therapeutic composition can be prepared in solid form or aqueous suspension, in a pharmaceutically acceptable diluent.
- It can be administered by any appropriate route of administration: oral, topical, rectal or parenteral.

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CARBOSILANE METALLODENDRIMERS CONTAINING RUTHENIUM AND COPPER IONS COORDINATED TO SCHIFF BASE LIGANDS, THEIR PREPARATION AND USES

Patent
ES2735282

Code

BIO_UAH_32

Application areas

- Biological Sciences
- Agrofood Industry
- Pharmaceutical and Cosmetics

Type of Collaboration

- Technical cooperation
- Comercial agreement
- License agreement
- Manufacturing agreement

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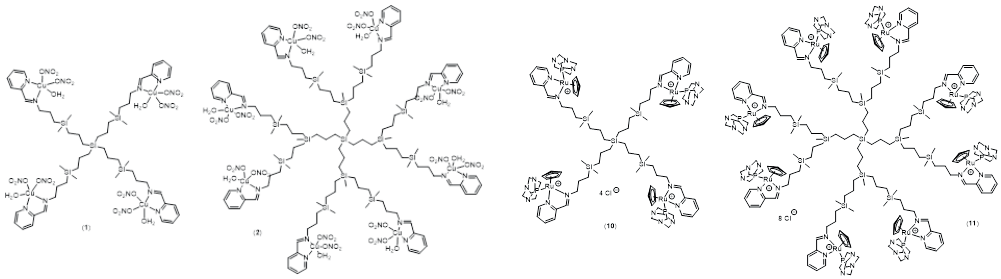

ABSTRACT

Preparation of metallodendrimers for their use in the treatment of various cancers, especially advanced prostate cancer, as well as infectious diseases caused by bacteria and other biomedical applications.

These systems are based on carbosilane dendritic skeletons functionalized on their periphery with Schiff bases capable of coordinating metal atoms, in this specific case the metals coordinated to the dendritic system are Cu(II) and Ru(II).

The preparation is carried out by coordinating the corresponding metal salt to the Schiff base groups of the precursor dendrimers, through simple synthetic routes with high yields.

In the metallodendrimers of the present invention, the dendrimer significantly increases the therapeutic activity with respect to the isolated metal complexes. Its antitumor activity in a variety of cell lines (derived from breast, cervix, prostate and colon tumours) is in the micromolar range and is selective, up to 16 times more active in tumour cell lines than in healthy ones. This antitumour activity is reproducible in in vivo assays, reducing up to 36% the volume of the subcutaneous tumour in immunosuppressed mice. In addition, they show bacteriostatic and bactericidal activity in both Gram+ and Gram- type bacteria. Therefore, these compounds are an interesting alternative for the use in the pharmaceutical industry, and can be employed as new drugs or formulations containing them, for the treatment of tumour diseases and as antimicrobial drugs.

ADVANTAGES AND INNOVATIONS

- Due to the lipophilic nature of the skeleton, even small generation systems have a high interaction with biological membranes, resulting in high biological activity and synthetic cost savings.
- The preparation process is highly versatile and can easily generate metallodendrimers based on different metals and on demand depending on the application.
- The dendritic nature gives these derivatives a nanoscopic size and a multivalence (capacity to host multiple groups on its surface) that can favour the properties of these compounds and different from what it would be found in these same groups if they were individually.
- Biodistribution tests carried out by ICP, after several in vivo assays, show that they are eliminated by urine and faeces, presenting low cardiotoxicity and low-moderate liver damage.
- The necessary development, for the commercial exploitation of this patent, does not involve a high technical difficulty

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Universidad de Alcalá

DRUG FORMULATION AND BIODISPONIBILITY

TECHNOLOGY OFFER

Code

BIO_UAH_34

Application areas

- Biological Sciences
- Other indistrial technologies

Type of collaboration

- Manufacturing agreement
- Comercial agreement
- Service agreement

Main researches

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ABSTRACT

This consolidated research group frames its research activity in the design, development, elaboration, control and evaluation of immediate or modified-release drugs, which has allowed new galenic developments and an optimization of existing drug formulations, or betting for galenic innovations.
The group has worked on numerous projects and maintains regular collaborations with companies in the pharmaceutical sector, which allows it to focus its research in a practical way and bring the results obtained closer to the market.
Our main lines of research focus on expanding the knowledge of the properties of drugs in relation to their polarity that allow us to find solutions to problems of solubility in liquid formulations, development of models and predictive theories of solubility, promotion of vectorization strategies to increase bioavailability, advance in the characterization of the drug release and/or absorption processes from the medicine that contains them and the evaluation of the pharmacokinetic profile after its administration to the organism, advance in the physical-chemical-drug-excipient characterization, development of rational criteria beneficial in drug formulation by predicting the release of active ingredients from polymer matrices, providing criteria that facilitate the prediction of drug release based on physical- chemical characteristics, polarity and degree of interaction with the polymer, saving in this way time and effort in the design of release systems.

ADVANTAGES AND INNOVATIONS

- Technical advice and consulting on drug formulation and development, scaling and manufacturing of pilot batches, quality control, stability studies, and manufacturing to third parties.
- Preformulation studies.
- Galenic design and development of innovative, generic and brand name (OTC) drugs.
- Galenic design and development of new forms of administration.
- Compatibility studies of active ingredients and excipients.
- Design of manufacturing processes.
- Expert reports.
- Patent study.

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