UNIVERSIDAD DE GRANADA | Oficina de Transferencia de Resultados de Investigación

GADOLINIUM COMPLEXES FOR USE IN ANTI-INFLAMMATORY THERAPY

A series of coordination compounds using lanthanides, and in particular gadolinium, as the central atom surrounded by both diclofenac molecules and solvent, have been developed for use as an anti-inflammatory treatment.
These coordination compounds show an anti-inflammatory activity 75 times higher than the activity of uncoordinated diclofenac.

Technology for Licensing

Keywords:
Diclofenac, gadolinium, metallic complex, antiflammatory, lanthanide, luminescence

Description:

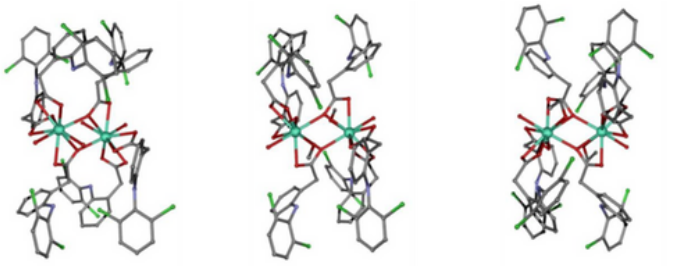
Diclofenac is a chemical compound belonging to the phenyl alkanoic acid family commonly used in drug development based on its analgesic, anti-inflammatory and antipyretic properties. Although Diclofenac by itself is a potent cyclooxygenase inhibitor, such activity is enhanced when this compound is used as a ligand in coordination compounds. The pharmaceutical industry uses transition series elements as the central atom in this type of compounds, without considering other elements, such as lanthanides, which could also be useful in drug development.

The invention describes dinuclear coordination compounds consisting of lanthanide group elements, such as gadolinium, as central ions, coordinated with both diclofenac molecules and solvent molecules suitable for medical use. The coordination compounds of this invention have a lower cytotoxic capacity compared to the use of drugs using free (uncoordinated) diclofenac, according to the results obtained in methyl tetrazolium assays. Furthermore, the tests carried out on culture media to determine the concentration of nitrite suggest that at a concentration of 48 µg/mL the anti-inflammatory response of the compounds comprising the present invention are 75 times higher than the response provided by diclofenac at the same concentration.

This invention represents an improvement in the effectiveness of existing anti-inflammatory products as well as incorporating a new line of coordinating compounds in medicine not explored to date.

Advantages and Benefits

- Greater anti-inflammatory activity than uncoordinated diclofenac.
- Lower cytotoxicity than uncoordinated diclofenac.
- Use of lanthanides for drug development



Compound 1 $[Gd_2(dicl)_6(H_2O)_4]$ | Compound 2 $[Gd_2(dicl)_6(MeOH)_2(H_2O)_2]$ | Compound 3 $[Gd_2(dicl)_6(EtOH)_2(H_2O)_2]$

Gadolinium complexes

Actuación en el marco del Proyecto OI-Booster: Plan de intensificación de acciones de Transferencia de Conocimiento en Entornos de Innovación Abierta. Objetivo prioritario OP.01 "Refuerzo de la investigación, el desarrollo tecnológico y la innovación".

UNIÓN EUROPEA
Fondo Europeo de Desarrollo Regional

Junta de Andalucía
Consejería de Transformación Económica, Industria, Conocimiento y Universidades

Andalucía se mueve con Europa

Patent status:
Spanish Patent application number: P202230425
Priority date: 18/05/2022

Contact:
Oficina de Transferencia de Resultados de Investigación (OTRI) - Universidad de Granada

patentes@ugr.es www.otri.ugr.es