



Molecular prototypes for development of new bioactive molecules

Patent Application: **MX/a/2016/016553**

Status: patent pending



Abstract: This invention relates to the organic synthesis of hydroxybenzylidene-1-indanone derivatives and their therapeutic application in cancer, Alzheimer and other neurodegenerative diseases due to their ability to form iron complexes. They can also form copper or vanadium complexes with semiconductive properties and complexes of boron with fluorescent properties, useful in other material industries

Background

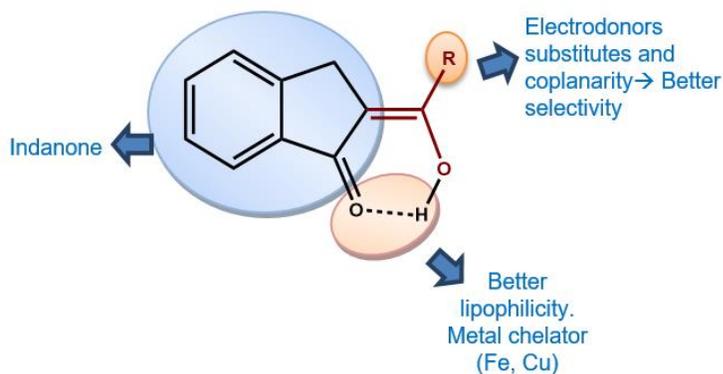
It is widely known that plants are an excellent source of new molecules with applications of interest, mainly in biology. One of the most ubiquitous functional structures in nature is **indanone**. This molecule presents cytotoxic and antibacterial activity because of its relation between its structure and its activity, it may also cross the hematoencephalic, which is essential in the treatment of several brain-related diseases. The versatility of these types of compounds, which have been proven effective with examples like donepezil and indanocine, has inspired the development and preparation of the molecular prototypes (ligands).

Description

Design, development and synthesis directed toward molecular prototypes (ligands) that due to its composition and structure allow the development of new compounds. This new compounds can both, present biological activity optimal for therapeutic uses against cancer, Alzheimer and neurodegenerative illnesses; and present semiconducting properties convenient for the construction of electronic devices.

Stage of research

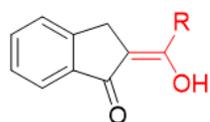
It has been shown that molecular prototypes are useful in the inhibition of the growth of cancer cells in several malignant pathologies like glial cancer of the central nervous system, prostate cancer, leukemia, colon cancer, breast cancer, and lung cancer; however, its activity is significantly better and more selective toward glial cancer of the central nervous system. These reasons cause these molecules to be susceptible to become pharmaceutical agents for medicines used in the inhibition of cancer cells.



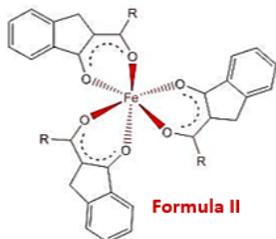
The results indicate the great potential in the biological application for medicines, not only for the treatment of cancer, but also for the treatment of conditions like Alzheimer or chronic inflammations. The formation of Iron complexes of these molecular prototypes shows their capacity to trap Iron (Fe) which is relevant in the treatment of cancer and Alzheimer.

Additionally, these compounds may trap Copper or Vanadium by the formation of metallic complexes.

These coordination compounds have interesting semiconductor properties for the construction of electronic devices. At the same time, boron complexes of these prototypes exhibit fluorescent properties which are important for the development of new tinctures in imageology.



Formula I



Formula II

- ✓ Use against cancer cells.
- ✓ Useful in Alzheimer and other Neurodegenerative illness.

Application fields

The current invention represents an important development in

- the **chemical**,
- **pharmaceutical**, and
- **medical** industries

Which are responsible of studying organic and inorganic structures with the objective of developing new bioactive molecules for therapeutic use.

Molecular prototypes of this invention and its respective metallic complexes present interesting properties in **biology** and **chemistry** of **cancer**, neurodegenerative diseases, and material science fields.

Additionally, such molecular prototypes are very versatile and have an application on agrochemical products, perfumes, new organic materials with application in non-linear optics, cytotoxic analogs, and polymeric units in liquid crystals.

Advantages

The molecular prototypes of this invention are based on the functional structure of indanone and their respective metallic complexes obtained through facile and quick synthesis methods. These compounds present interesting properties in chemistry and biology of cancer, neurodegenerative diseases and in material sciences. They are therefore candidates for the development of compound libraries synthesized directly for the development of new medicines and new materials in electronics and imageology. Their composition, structures, configuration and chemical coplanarity, in contrast to other similar compounds, increases:

- (a) its **selectivity** – specially towards cancerous cell lines,
- (b) its **lipophilicity** and
- (c) their metal **chelation** abilities.

