Drug for treatment of cerebral diseases.

KEYWORDS

- ❑ GLIOBLASTOMA
- ❑ MALIGNANT GLIOMAS
- ❑ BRAIN TUMORS
- ❑ INTRANASAL DELIVERY
- ❑ HEDGEHOG PATHWAY

AREA

- ❑ PHARMACEUTICAL

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Patent Type
Patent for invention.

Co-Ownership
Sapienza University of Rome 67%, Italian Institute of Technology 33%.

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Industrial & Commercial Reference
Pharmaceutical Industries involved in the development of antitumoral drugs and innovative routes of administration.

Time to Market
Now the drug and the intranasal route of administration are at preclinical stage. It will be necessary to implement the clinical phases I, II and III in patients with brain tumors (3-5 years).

Availability
Cession, Licensing, Research, Development, Experimentation, Collaboration, Start-up and Spin-off.

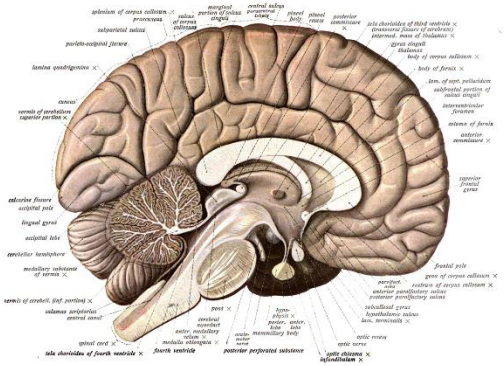

Fig. 1 Human brain bisected in the sagittal plane, showing the white matter of the corpus callosum.

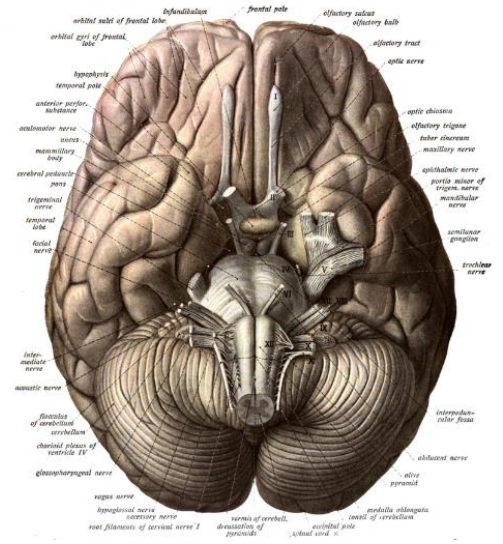

Fig. 2 Human brain viewed from below, showing cerebellum and brainstem.

Abstract
The present invention provides a method for a rapid and effective distribution of an antitumor compound.

Unlike standard administrations, it will be possible to use the minimum pharmacologically active amount of the compound locally, thus avoiding any side effects due to massive drug administration in regions of the body far from the tumor site, the brain.
In addition it will be assured a direct absorption in the blood, thus avoiding cell metabolism that effects that can significantly reduce the plasma concentrations of the compound.

Publications

❖ Infante P. et al. Gli1/DNA interaction is a druggable target for Hedgehog-dependent tumors. EMBO J. 2015 Jan 13;34(2):200-17.

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Drug for treatment of cerebral diseases.

Technical Description

The present invention refers to an anti-tumor compound, tested on murine and human brain tumor cells, as well as in animal models of glioblastoma, the most common and severe brain tumor in humans.
This compound has the ability to block biological / biochemical processes that lead to uncontrolled growth of the tumor. In animal models of glioblastoma the compound was administered intranasally.
We found that the compound was able to quickly reach the brain and through these studies we demonstrated that the antitumor action of the compound is effective at much lower doses than those used in the classic routes of administration.

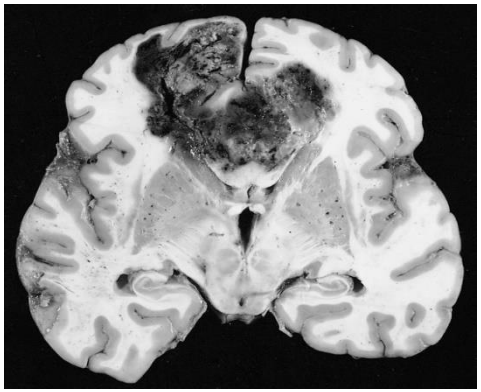

Fig. 3 Untreated glioblastoma. Macroscopic examination.

Technologies & Advantages

The present invention provides a method for a rapid and effective distribution of an antitumor compound through the brain.

Unlike standard administrations that are invasive for patients (e.g. intravenous or intramuscular injections), where a high amount of active agent is also required, using the present invention will be possible to use the minimum pharmacologically active amount of the compound locally and not invasively, thus avoiding possible side effects due to a massive administration of the drug in regions of the body distant from the region affected by the tumor, the brain.

It is also guaranteed a direct absorption in the blood and a high plasma stability of the drug: these characteristics avoid the development of metabolic processes that can significantly reduce the plasma concentrations of the compound and therefore allow the use of less quantity of drug compared to the standard administrations ensuring the same antitumor action.

Applications

The fields of application of this invention are the treatment and prevention of brain tumor pathologies, specifically brain tumors whose growth is particularly dependent on biological / biochemical processes related to the Hedgehog signaling pathway.

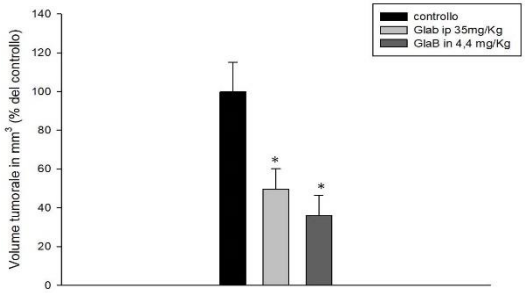

Fig. 4 Histogram of the tumor volume measured in mm3 in mice inoculated with murine glioma cells. Statistical analysis using Student T-test showed a significant reduction (* p <0.001) of tumor volume in mice treated with intraperitoneal GlaB (N = 7, 35mg / kg), (0.48 + 0.10 mm3) and intranasal (N = 7, 4.4mg / kg) (0.21 + 0.04 mm3) compared to control mice, which were treated with the vehicle alone (ethanol: hydroxypropyl-beta-cyclodextrin, 1: 5) (N = 10, 0.96 + 0.18 mm3) .neri).

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