TREATMENT OF GLIOMA, GLIOBLASTOMA, AND ASTROCYTOMA

SUMMARY

The National Institute on Aging, Laboratory of Clinical Investigation is seeking statements of capability or interest from parties interested in collaborative research to further develop, evaluate, or commercialize the use of fenoterol and fenoterol analogs in the front line and adjuvant treatment of CNS tumors and other B2 AR expressing tumors.

REFERENCE NUMBER

E-013-2010

PRODUCT TYPE

- Therapeutics

KEYWORDS

- brain
- Fenoterol
- B2 AR-positive
- glioma
- glioblastoma
- astrocytoma

COLLABORATION OPPORTUNITY

This invention is available for licensing.

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DESCRIPTION OF TECHNOLOGY

To date there is no effective treatment for the brain tumors or brain cancers indentified as gliomas, glioblastomas, or astrocytomas. This technology relates to the discovery that fenoterol and related analogues block astrocytoma and glioblastoma cell division at low doses. In a xenograft model utilizing the 1321N1 astrocytoma tumor implanted in the flank of SKID mice, the (R,R)-4-methoxyfenoterol analogue significantly decreased tumor growth relative to a control group receiving vehicle and studies utilizing [3H]-(R,R)-4-methoxyfenoterol have shown that the compound readily passes the blood-brain barrier. The anti-tumor effect is associated with the ability of fenoterol and related analogues to induce

production of cyclic adenosine monophosphate (cAMP), which is normally decreased in glioblastomas and astrocytomas. Induced cAMP production inhibits brain tumor growth in vivo. Fenoterol and related analogues are beta-2 adrenergic receptor (B2 AR) agonists and the anti-tumor effect is associated with the expression of this receptor. Since there is a heterogeneous expression of B2 AR in human brain tumors, patients who will respond to fenoterol therapy can be predetermined leading to individualized treatment.

In addition to use in the initial treatment of brain tumors, the systemic and CNS bioavailability of the drug after oral administration and the minimal systemic toxicity suggest that fenoterol and it analogs can be used in the adjuvant treatment of patients with B2 AR-positive gliomas, glioblastomas or astrocytomas. Studies with a number of fenoterol analogs and CNS-implanted tumors are in progress.

POTENTIAL COMMERCIAL APPLICATIONS

- Therapeutic in the front line and adjuvant treatment of glioma, glioblastoma and astrocytoma.

COMPETITIVE ADVANTAGES

- Potential first-in-class therapeutic for multiple types of brain tumors.

INVENTOR(S)

- Irving W Wainer (NIA)

DEVELOPMENT STAGE

- Pre-clinical (in vivo)

PATENT STATUS

- **U.S. Filed:** U.S. Provisional Application No. 61/312,642 filed 10 Mar 2010

THERAPEUTIC AREA

- Cancer/Neoplasm
- Central Nervous System, Mental and Behavioral, Pain