TECHNOLOGY

The beta subunit of human hemoglobin (HBB): a Cytostatic/Cytotoxic Peptide for the Treatment of Neuroblastoma Lung Metastases

OVERVIEW

A collaborative research project between the University of Maryland, Baltimore and Tel Aviv University has identified a synthetic peptide derived from the beta subunit of hemoglobin (HBB2), *which inhibits the propagation of micrometastatic neuroblastomas (NB).* In vitro studies have demonstrated that HBB2 can significantly reduce the viability and proliferation of neuroblastoma cells through inhibition of cell cycle progression and induction of apoptosis. Murine xenograft studies have demonstrated potent inhibition of local, lung and bone metastatic tumor growth in peptide-treated versus control-treated groups.

APPLICATIONS

NB is the most common extracranial solid cancer affecting children and accounts for approximately 15% of childhood cancer-related deaths. Over half of all cases diagnosed typically present metastasis in the lymph nodes, bones, and liver at the time of discovery. The causes of neuroblastoma are yet unknown and only 1-2% of cases have been identified as a heritable form of the cancer. While early screening is successful in identifying neuroblastoma tumors, many cases spontaneously regress to a benign, non-cancerous stage and may not warrant the use of surgery, chemo or radiation therapies. Currently there are no targeted therapies with FDA approval for the treatment of neuroblastoma. Treatment modalities that are successful in restraining the progression of the disease without severe side-effects or damage to normal tissues are highly desirable.

ADVANTAGES

The HBB2 peptide:

- *Reduces the viability of lung-metastasizing NB cells, specifically that of micrometastatic NB cells.*
- *Reduces the viability of other lung-metastasizing cancer cells such as MCF-7.*
- *Reduces cell survival signaling, decreasing ERK and FAK phosphorylation*
- *Induces cell-cycle arrest in G0-G1 phase*
- *alters the expression of genes involved in cell proliferation, survival, apoptosis, adhesion, migration andinvasion and regulation of actin cytoskeleton*
- *leads to higher stem-cell marker expression on the surviving micrometastatic NB cells*

STAGE OF DEVELOPMENT

· - HBB2 significantly reduces the viability and proliferation of neuroblastoma cells through inhibition of cell cycle progression and induction of apoptosis.

· - Murine xenograft studies have demonstrated potent inhibition of local, lung and bone metastatic tumor growth in peptide-treated versus control-treated groups.

R&D REQUIRED

Further preclinical characterization of the biologic activity as well as pharmaco-kinetics/dynamics are currently being pursued.

LICENSING POTENTIAL

UM seeks to develop and commercialize by an exclusive or non-exclusive license agreement and/or sponsored research with a company active in the area.

CONTACT INFO

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Additional Information

INSTITUTION

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PATENT STATUS

PCT application filed, pending

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