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T E C H N O L O G Y O P P O R T U N I T Y

Anti-Mitotic Peptides for Treatment of Cancer

McGill University, together with its collaborators at Université d'Angers and INSERM, are seeking to outlicense a portfolio of anti-mitotic peptides for the treatment of cancer. In particular, the NFL-TBS₄₀₋₆₃ peptide demonstrates efficacy in treating malignant gliomas in animals models. Glioblastomas are the most common primary CNS malignant glioma in adults and accounts for nearly 75% of cases. Gliomas can not be cured and the prognosis for patients with high-grade gliomas is generally poor. Of 10,000 Americans diagnosed each year with malignant gliomas, only half are alive one year after diagnosis, and 25% after two years. Glioblastoma multiforme (GBM) has a worse prognosis. Chemotherapeutic drugs presently in use offer only limited efficacy due to lack of specificity of these agents for neoplastic tissue resulting in severe neurotoxicity. There is a clear market need for a new anti-tumor drug to treat gliomas.

Description

Cancers are characterized by abnormal cell proliferation. Therefore molecules targeting the process of cell division have long been of interest. Using peptide-array technology the inventors have identified peptides with sequence homology to multiple types of intermediate filaments that bind tubulin. Intermediate filaments are highly cell type specific. Therefore, it is reasonable to expect that peptides with various tissue-specificity can be developed. To date such peptides have been recovered from neurofilaments, keratin, vimentin, GFAP and desmin. In particular, NFL-TBS₄₀₋₆₃, a peptide which corresponds to the second tubulin-binding site of the light neurofilament subunit, seems to be actively and selectively transported into glioma cells, inhibits microtubule polymerization, and arrests glioma cell proliferation in vitro. Further, intracranial administration of NFL-TBS₄₀₋₆₃ is effective in delaying or in some cases, completely preventing progression of transplanted glioblastoma cells in rat models.

Advantages

- NFL-TBS₄₀₋₆₃ provides similar therapeutic efficacy as microtubule-targeting agents such as taxol while specifically targeting brain tumor cells, thus preserving the integrity of normal astrocytes and neurons.
- NFL-TBS₄₀₋₆₃ can be synthesized thereby avoiding the purification step required for molecules extracted from tissues or plants.

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