



The Neurofilament-Derived Peptide NFL-TBS.40-63 Targets Neural Stem Cells and Affects Their Properties

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Mots-clés	<p>Animals [4], Animals, Newborn [5], Biological Transport [6], Brain [7], Cell Cycle [8], Cell Survival [9], Cells, Cultured [10], Drug Delivery Systems [11], Female [12], Injections, Intraventricular [13], Neural stem cells [14], Neurofilament Proteins [15], Peptide Fragments [16], Rats [17], Rats, Wistar [18]</p> <p>Targeting neural stem cells (NSCs) in the adult brain represents a promising approach for developing new regenerative strategies, because these cells can proliferate, self-renew, and differentiate into new neurons, astrocytes, and oligodendrocytes. Previous work showed that the NFL-TBS.40-63 peptide, corresponding to the sequence of a tubulin-binding site on neurofilaments, can target glioblastoma cells, where it disrupts their microtubules and inhibits their proliferation. We show that this peptide targets NSCs in vitro and in vivo when injected into the cerebrospinal fluid. Although neurosphere formation was not altered by the peptide, the NSC self-renewal capacity and proliferation were reduced and were associated with increased adhesion and differentiation. These results indicate that the NFL-TBS.40-63 peptide represents a new molecular tool to target NSCs to develop new strategies for regenerative medicine and the treatment of brain tumors.</p>
Résumé en anglais	<p>SIGNIFICANCE: In the present study, the NFL-TBS.40-63 peptide targeted neural stem cells in vitro when isolated from the subventricular zone and in vivo when injected into the cerebrospinal fluid present in the lateral ventricle. The in vitro formation of neurospheres was not altered by the peptide; however, at a high concentration of the peptide, the neural stem cell (NSC) self-renewal capacity and proliferation were reduced and associated with increased adhesion and differentiation. These results indicate that the NFL-TBS.40-63 peptide represents a new molecular tool to target NSCs to develop new strategies for regenerative medicine and the treatment of brain tumors.</p>

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Liens

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