HERPES SIMPLEX VECTORS EXPRESSING FGF-2 AND BDNF PROMPT NEURONOGENESIS AND EXERT DISEASE-MODIFYING EFFECTS IN A MODEL OF TEMPORAL LOBE EPILEPSY

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Neurotrophic factors (NTF) are involved in the survival, proliferation and differentiation of neurons from their precursors. Therefore, modulating NTF levels in lesion areas may represent a new approach for the therapy of seizure-induced damage. It is reported here that recombinant herpesvirus-based vectors expressing a combination of two NTFs, FGF-2 and BDNF, increases survival and proliferation of neural progenitors and favors their differentiation into neurons *in vitro*. These vectors were also tested *in vivo*, in a model of status epilepticus-induced neurodegeneration and epileptogenesis. When injected in the hippocampus 3 days after status epilepticus, FGF-2/BDNF expressing vectors partially repaired neuronal damage and prevented the occurrence of spontaneous seizures. Thus, supplementation of FGF-2 and BDNF promotes neuronogenesis and repair of existing neuronal damage, modifying the disease course in a model of epilepsy associated with hippocampal damage. Notably, these findings were obtained under conditions that reproduce those that may allow therapeutic intervention in patients.