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Cellular therapy after spinal cord injury using neural progenitor cells

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Stellingen:

1. Multipotent neural progenitor cells that are isolated from the adult spinal cord of rats survive transplantation into the acutely injured spinal cord and differentiate into astroglia and oligodendroglia only. (This thesis).
2. Multipotent neural progenitor cells facilitate regenerative sprouting of corticospinal tract axons in the acutely lesioned spinal cord when co-grafted with fibroblasts. (This thesis).
3. Highly purified grafts of Schwann cells are not able to replace the cystic defect that develops after spinal cord injury. (This thesis).
4. Adult derived neural progenitor cells cannot be used to induce long-term transgene expression in an ex vivo gene therapy approach using the currently available retroviral vectors. (This thesis).
5. Magnetic resonance imaging at 17.6 T provides extremely high-resolution *in vivo* visualization of structural changes, which are sometimes not even seen with histological analysis of spinal cord injured animals over time. (This thesis).
6. Extensive spontaneous collateral sprouting of the partially injured corticospinal tract correlates with functional motor recovery in the adult central nervous system of rats.
(Weidner *et al.*, PNAS 2001 98(6) 3513-3518).
7. Fibroblast therapy in combination with Neurotrophin-3 gene delivery can both elicit growth of corticospinal axons and improves functional outcome in chronic stages of spinal cord injury, however a causal relation between outgrowth and functional improvement cannot be shown.
(Tuszynski *et al.*, Exp Neurol 2003 181(1) 47-56).
8. It is not sufficient to demonstrate axon elongation in combination with behavioral improvement after spinal cord injury to conclude that the observed regenerating axons are responsible for the improved functional outcome
(Horner and Gage, Nature 2000 407(6807) 963-970).
9. Grafts of adult neural stem cells into a rat thoracic spinal cord contusion injury improves functional outcome, but also causes aberrant axonal sprouting that is associated with allodynia-like hypersensitivity of the forepaws.
(Hofstetter *et al.*, Nat Neurosci 2005, 8(3) 346-353).
10. In terms of the superior quality of the local beer, the province of Limburg is the Free State of Bavaria of the Netherlands.