Universidade Federal de São Paulo

REVISÃO:

BIOLOGIA DO TRATAMENTO COM CÉLULAS-TRONCO

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ABRIL/2007

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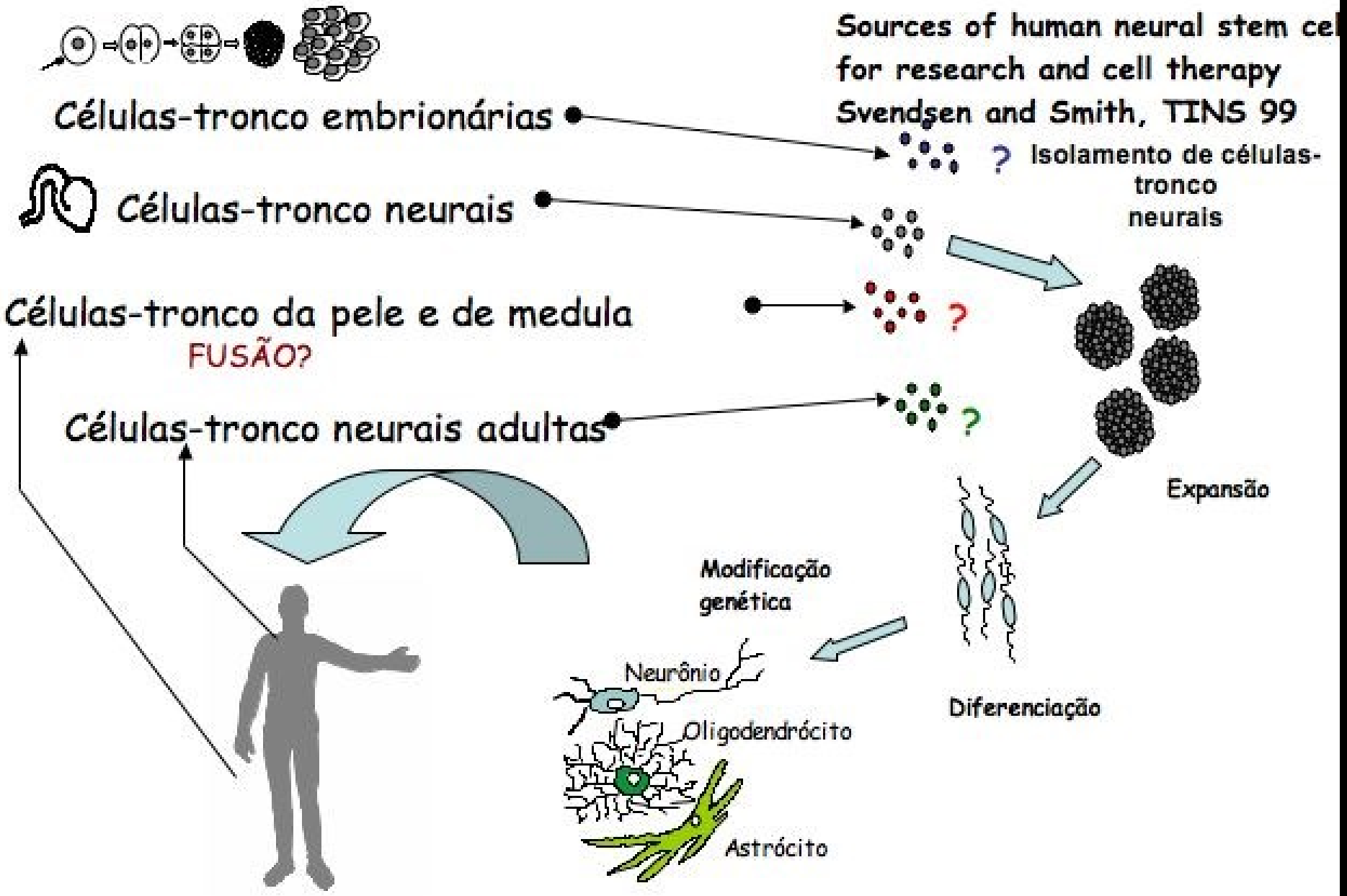
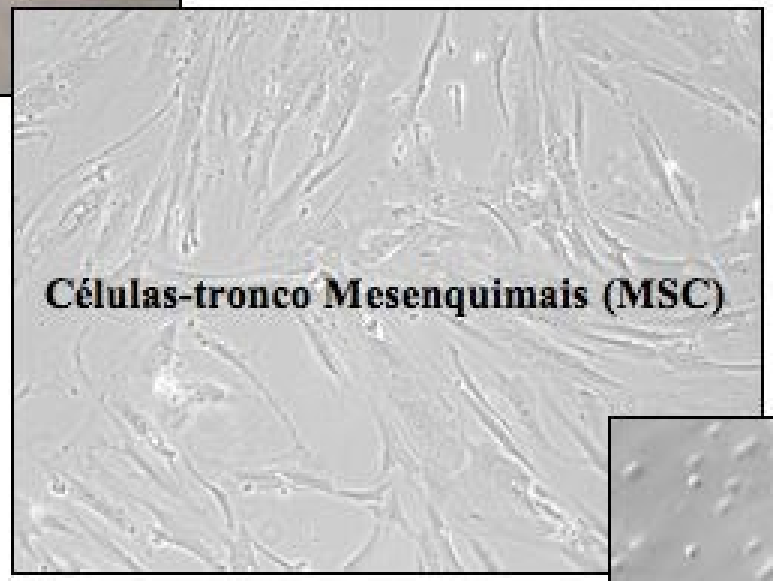
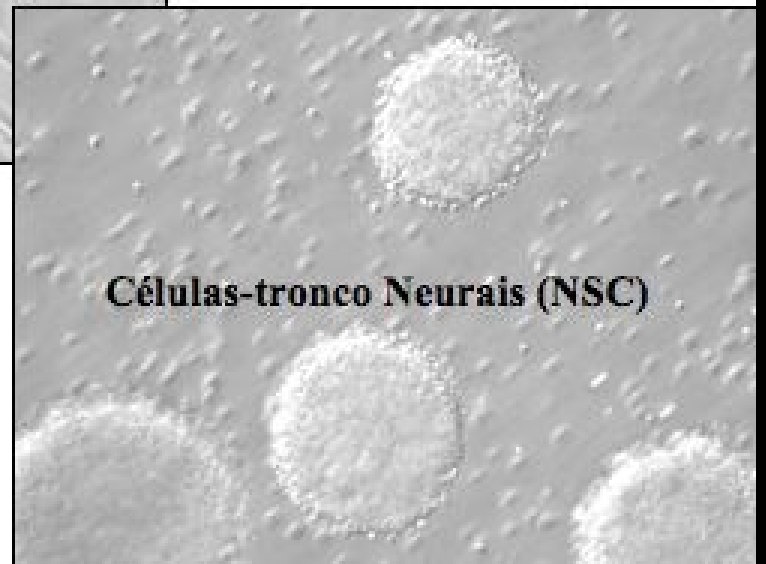
De onde vem as células-tronco?

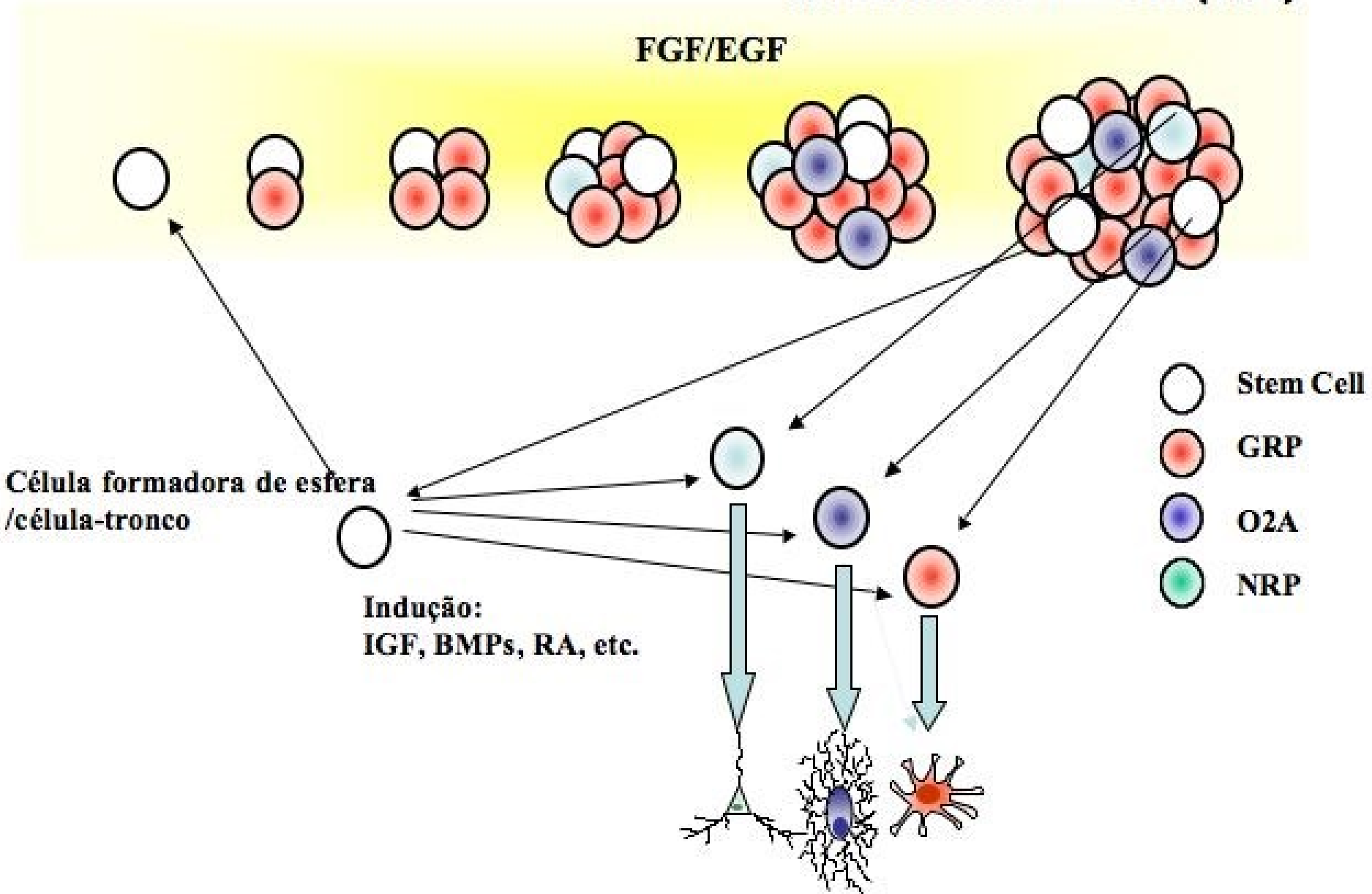


Células-tronco Embrionárias (ESC)


Células-tronco Mesenquimais (MSC)


Células-tronco Neurais (NSC)

Reynolds, Tetzlaff and Weiss
J. Neuroscience 12: 4565 (1992)

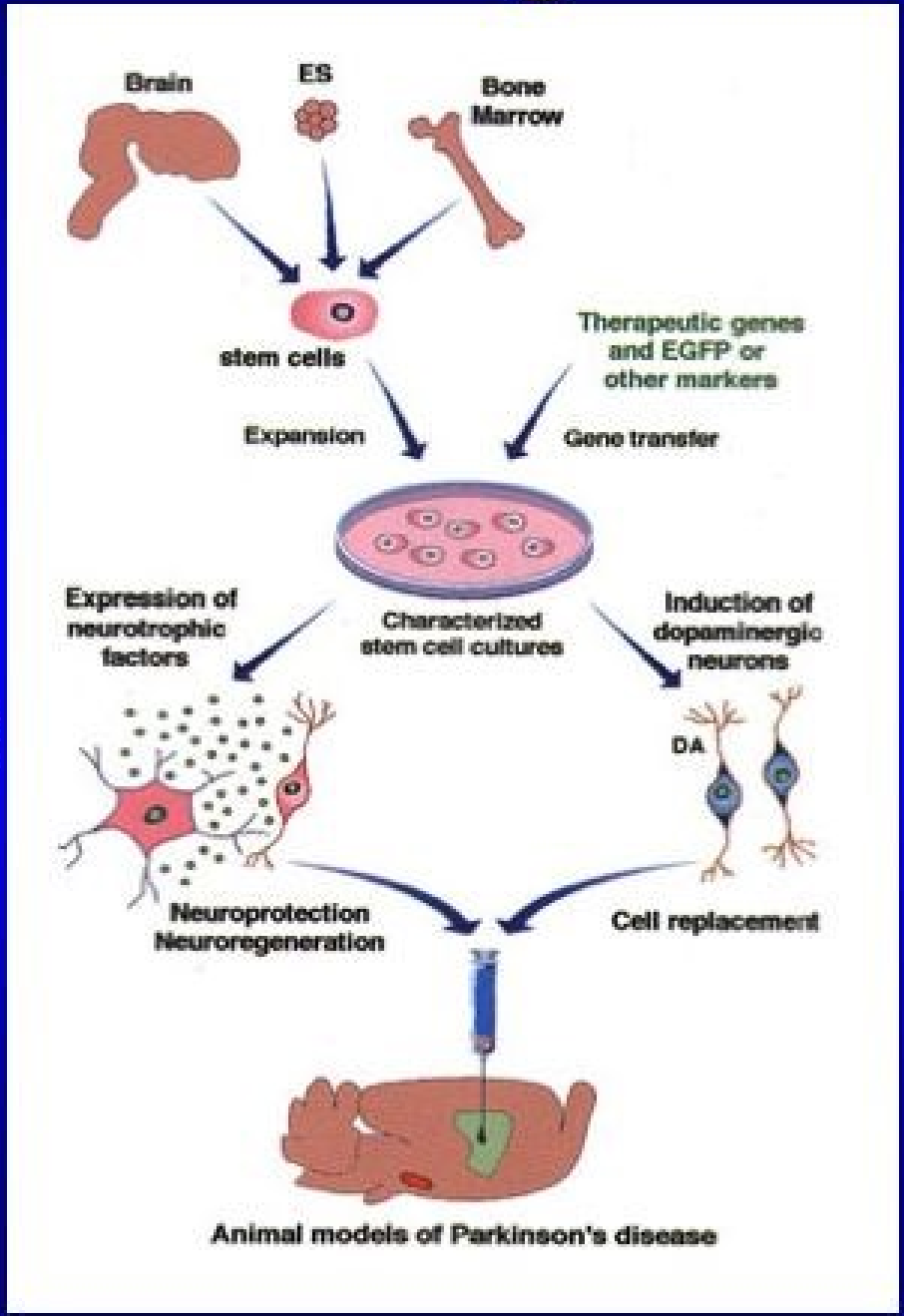


Potencialidade Celular

Diferenciação por 7d

Estratégias

Neuroproteção

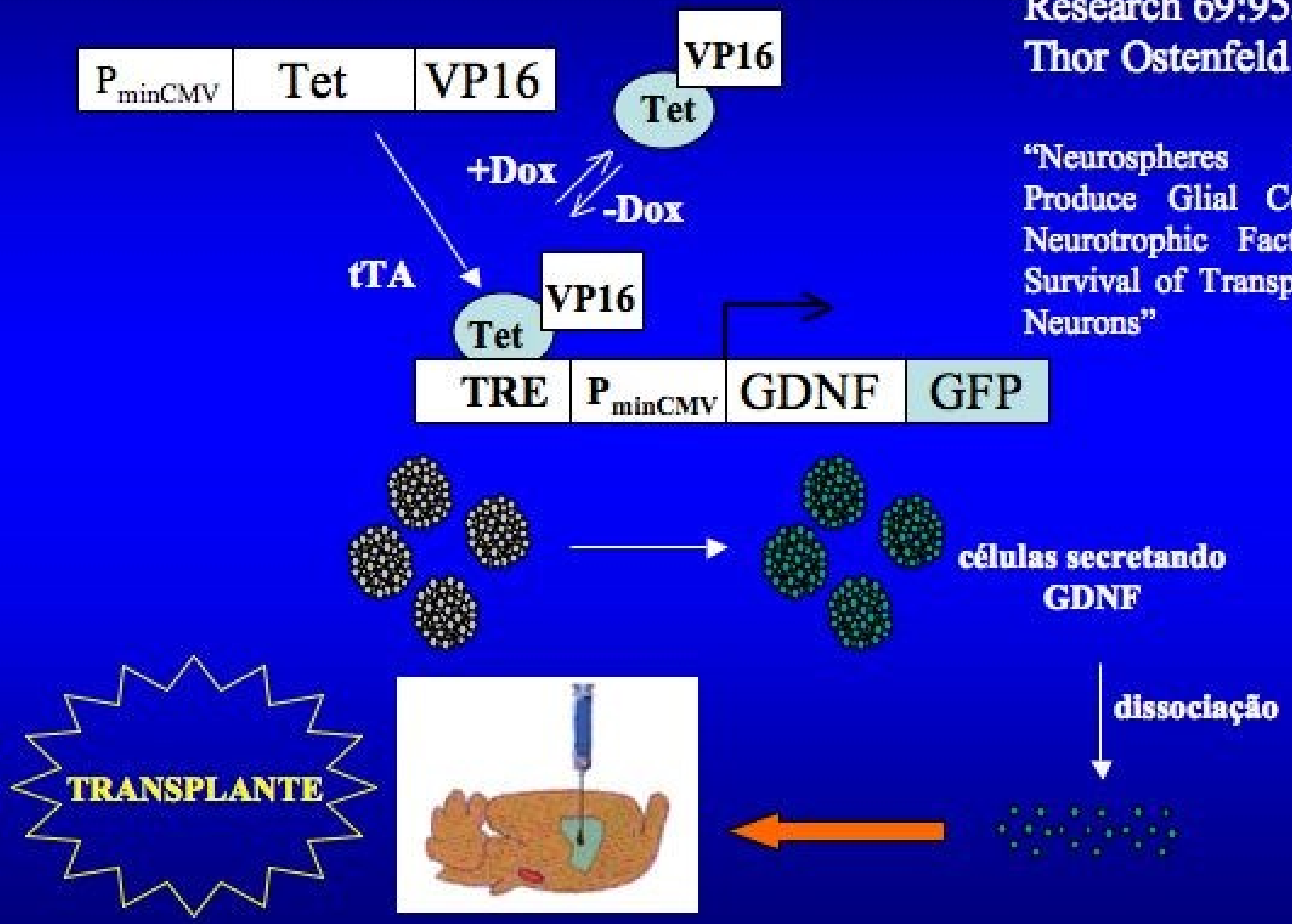


substituição celular

Neuroproteção

Journal of Neuroscience Research 69:955–965 (2002)
Thor Ostenfeld et al.

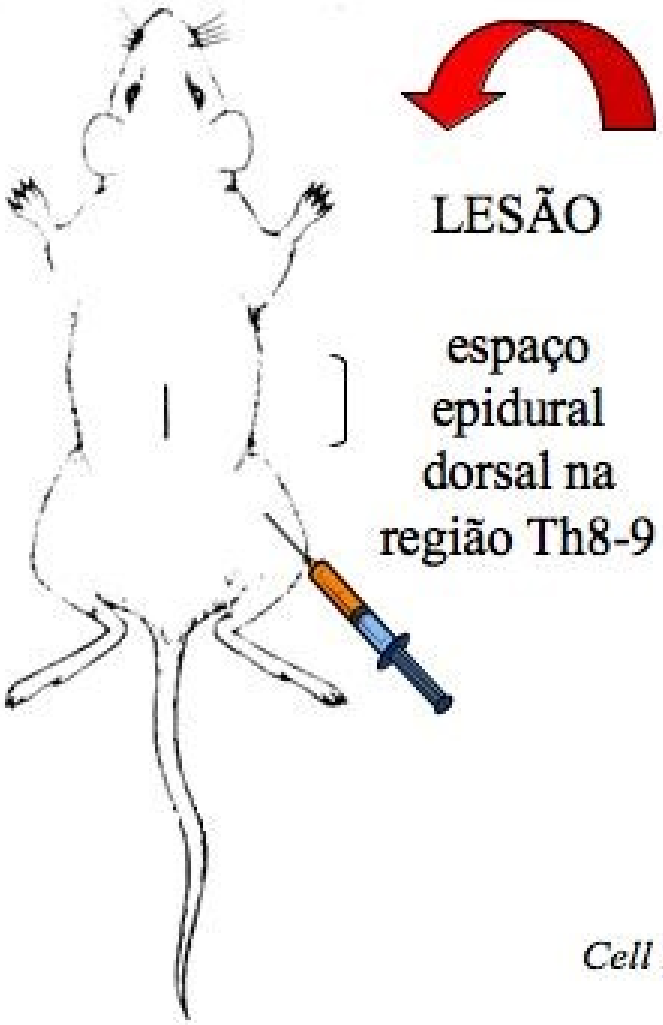
"Neurospheres Modified To Produce Glial Cell Line-Derived Neurotrophic Factor Increase the Survival of Transplanted Dopamine Neurons"



MODELOS PRÉ-CLÍNICOS DE LESÃO MEDULAR E CÉLULAS-TRONCO

Artigo 1: Terapia com MSC

Transplants of Human Mesenchymal Stem Cells Improve Functional Recovery After Spinal Cord Injury in the Rat

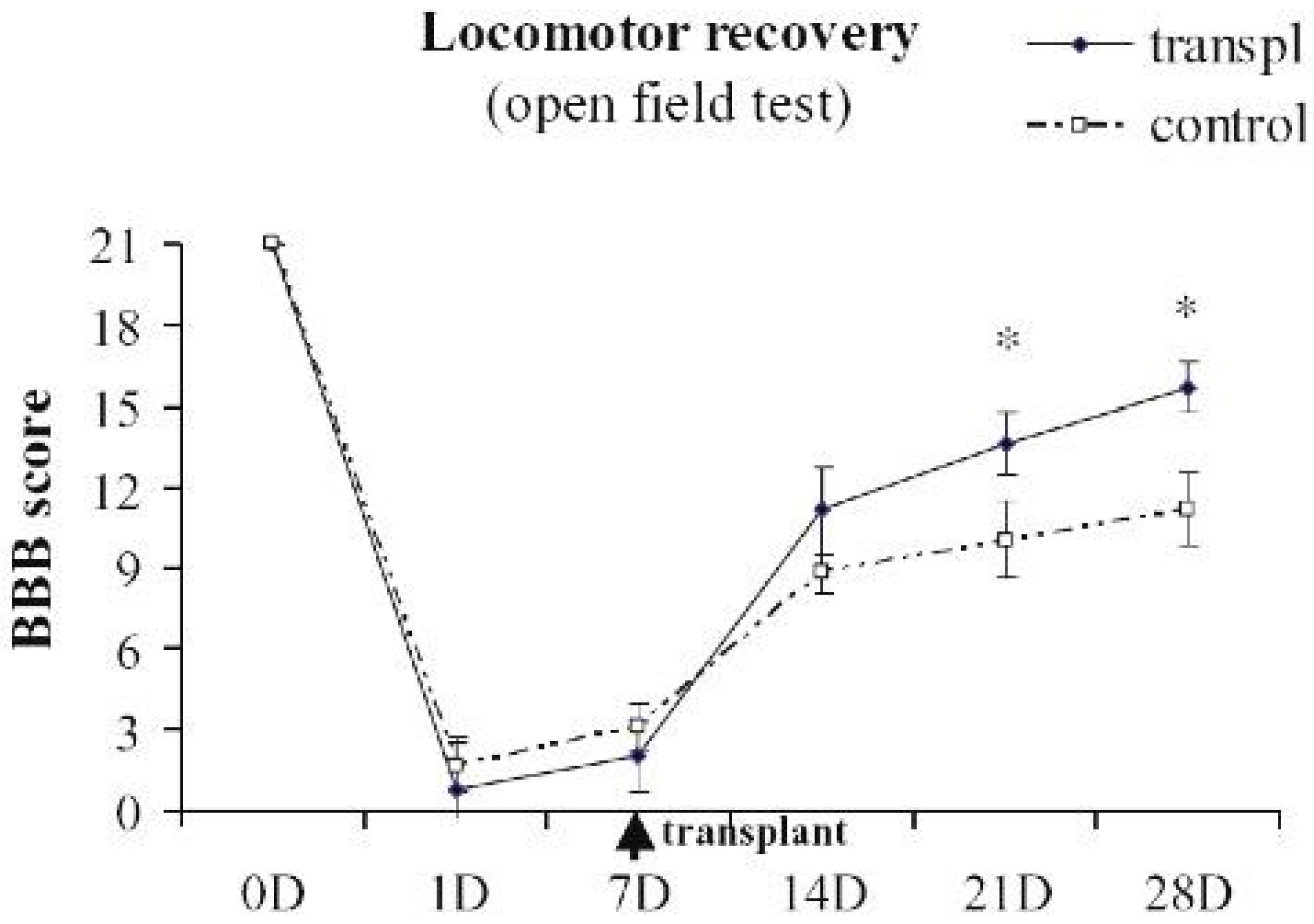


Transplante de hMSC

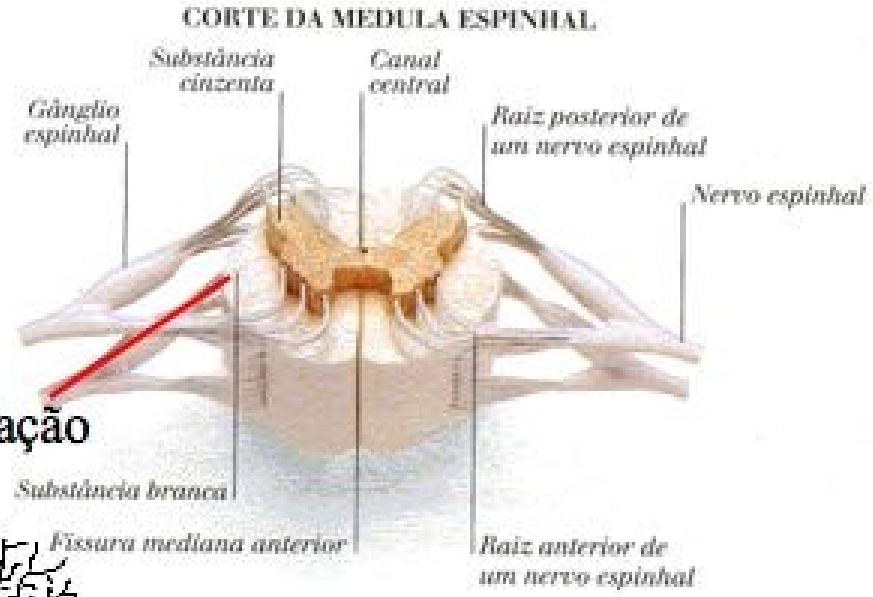
$1X10^6$ hMSC em 0,5 mL DMEM, na veia femoral direita, 7 dias após SCI.

Cell Mol Neurobiol. 2006 Oct-Nov;26(7-8):1167-80

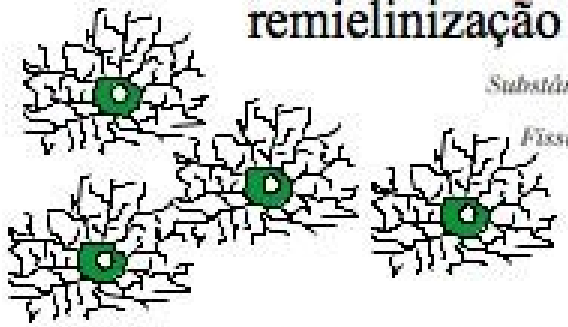
RECUPERAÇÃO MOTORA



DIFERENCIAÇÃO E RECUPERAÇÃO FUNCIONAL



remielinização



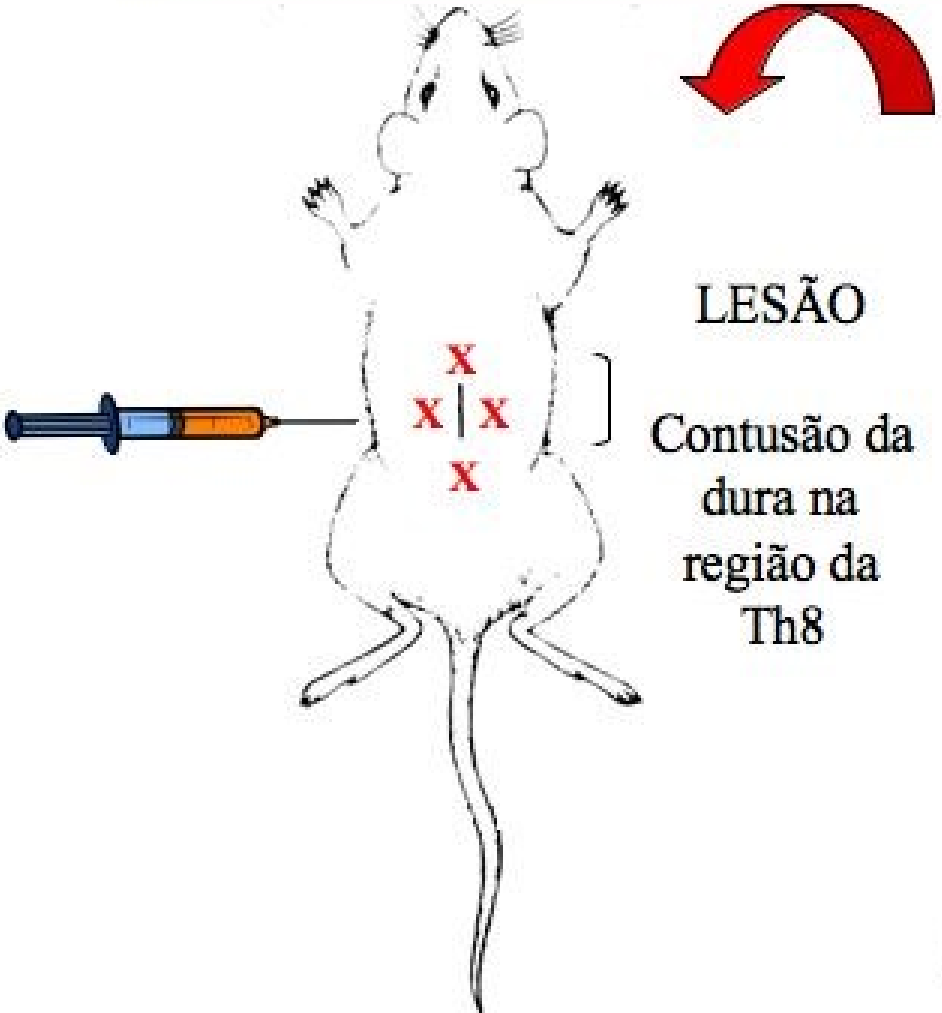
Apenas 2% hMSC se diferenciam em oligodendrócitos

Responsável pela recuperação → FATORES DE CRESCIMENTO
QUIMIOCINAS
CITOCINAS

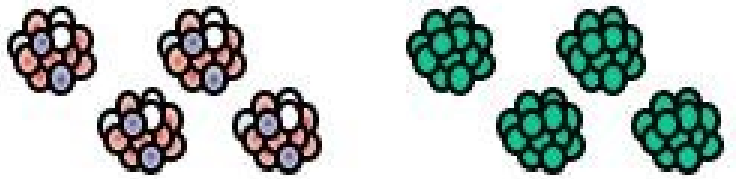
(NGF, BDNF, VEGF)

Artigo 2: Terapia com NSC modificadas geneticamente

Pain with no gain: Allodynia following neural stem cell transplantation in spinal cord injury



após 8 dias da SCI



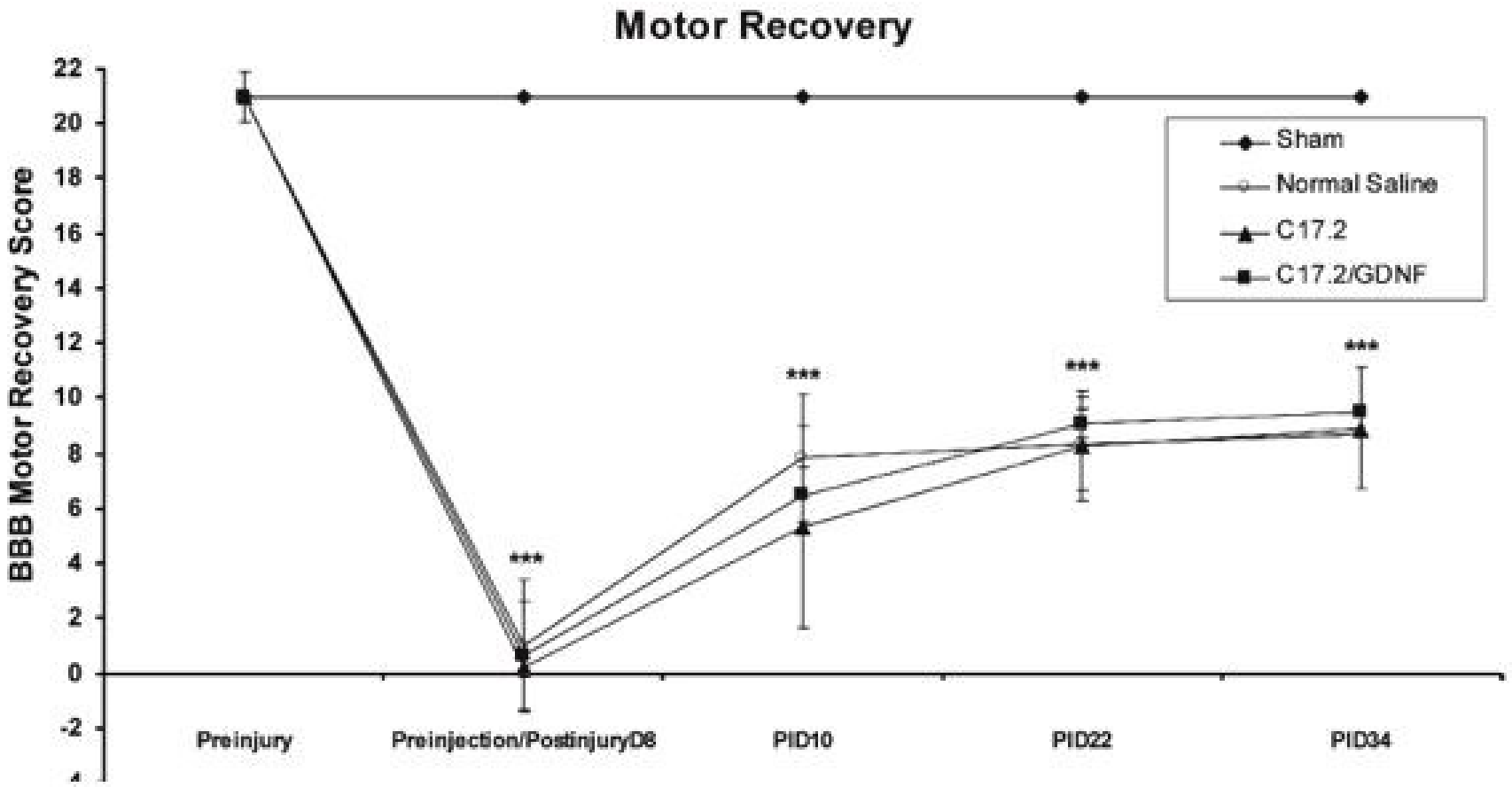
NSC NSC-GDNF

Transplante de NSC

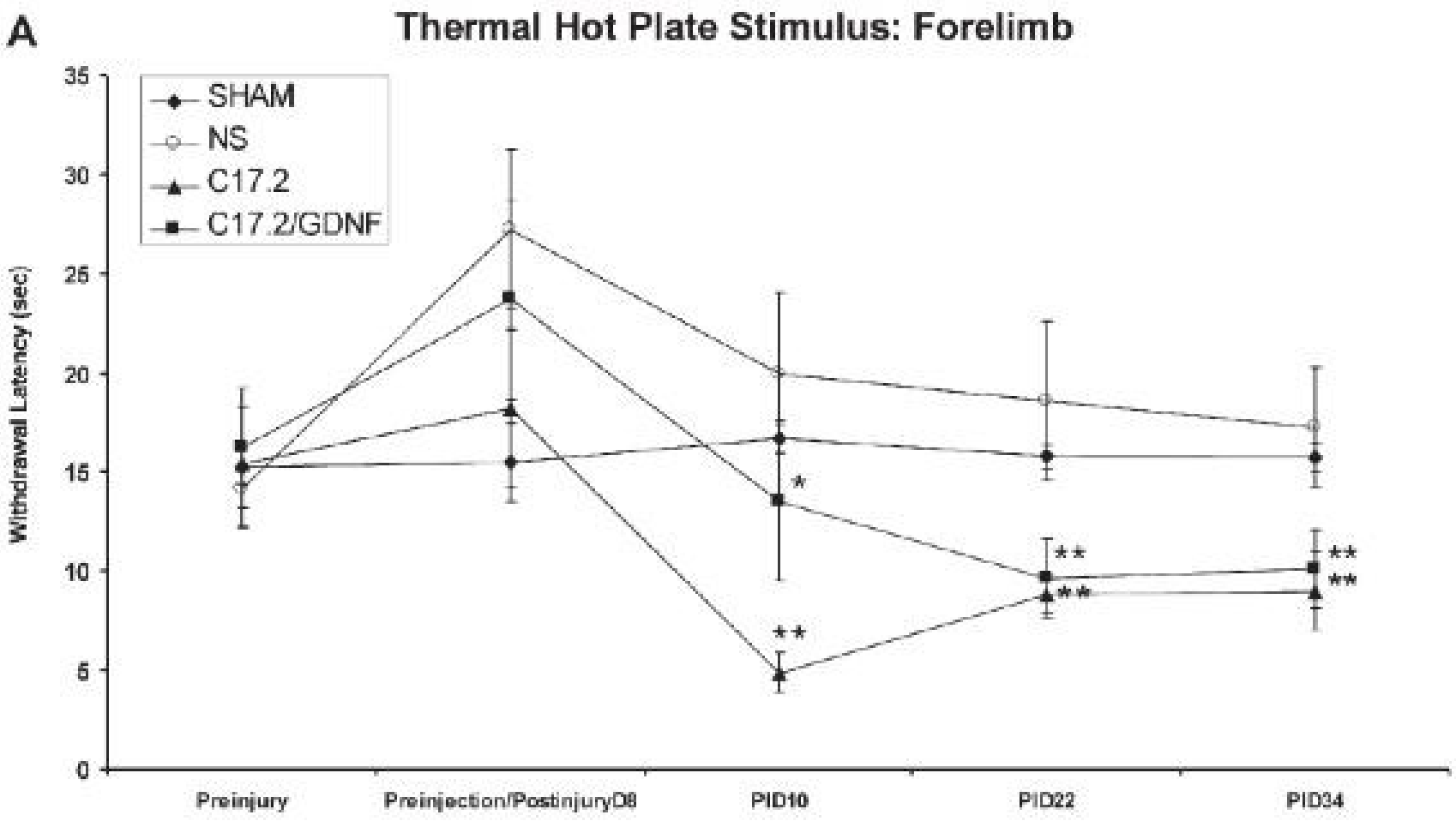
4 injeções de 25.000 céls/5 µL na Th8 , 8d após SCI.

Experimental Neurology (2006) Oct;201(2):335-48

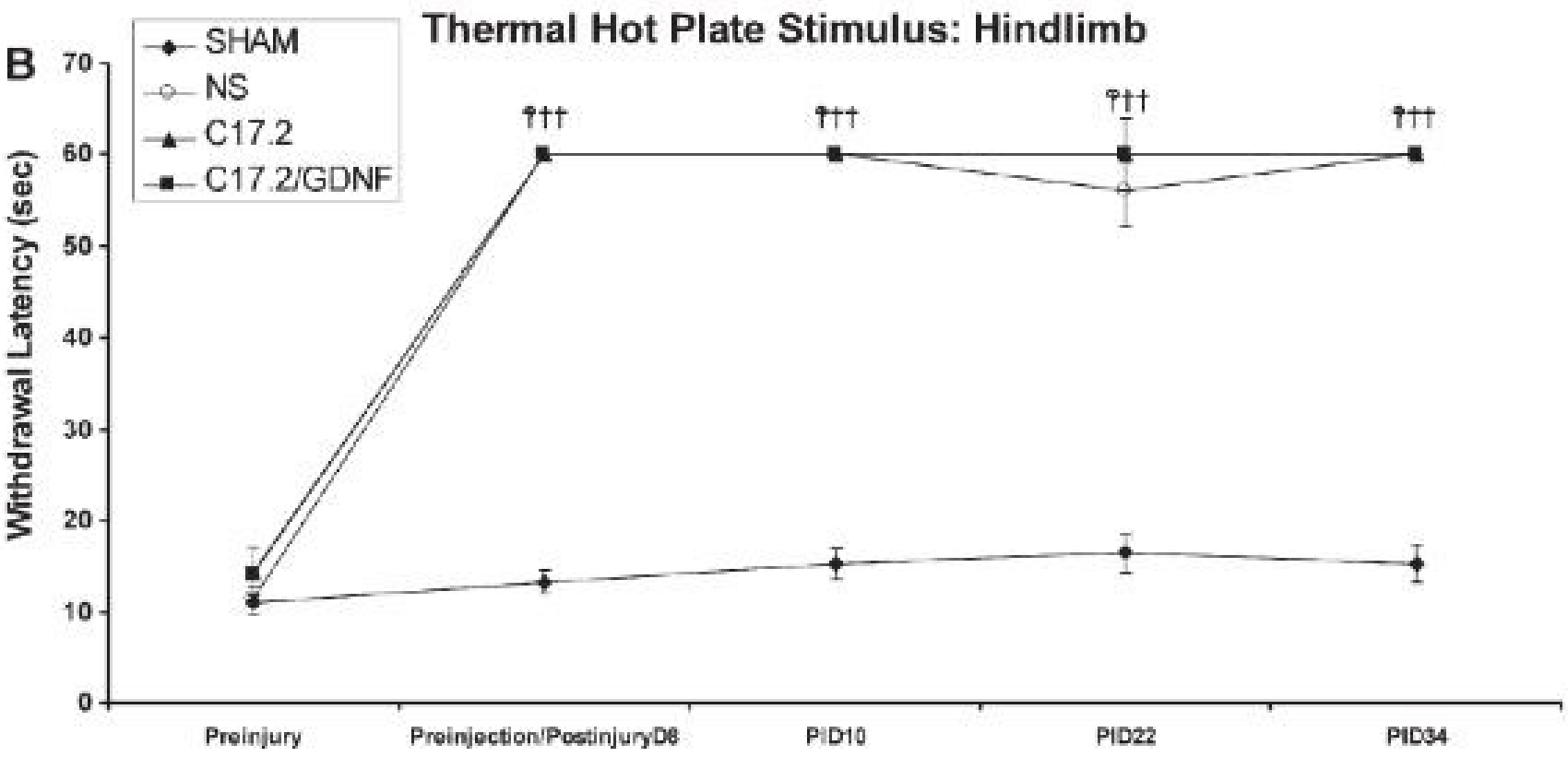
Recuperação Motora Não é Afetada Pela Presença de NSC



Estímulo Térmico: Membro Anterior
Aumento da Alodinia Após Injeção de NSC

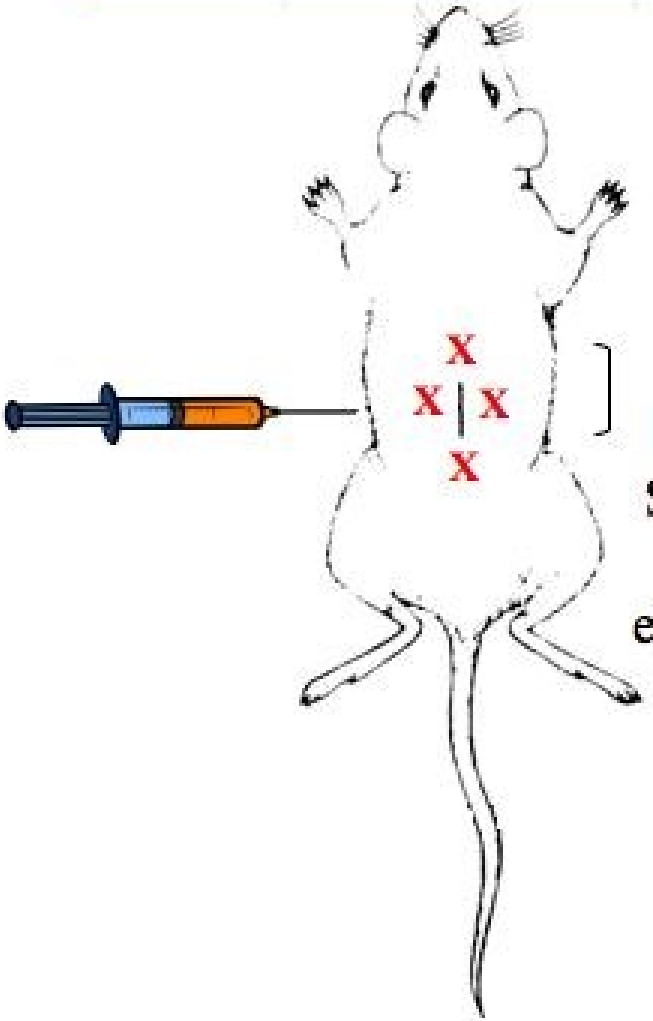


Estímulo Térmico: Membro Posterior
Não Houve Ganho na Sensibilidade Após Injeção de NSC



Artigo 3: Terapia com ESC e cocktail de fatores de crescimento/drogas

Hopkins Scientists Use Embryonic Stem Cells, New Cues To Awaken Latent Motor Nerve Repair



LESÃO

infecção com Sindbis virus – mata especificamente neurônios motores

NSC

ESC

Transplante de neurônios motores derivados de ESC

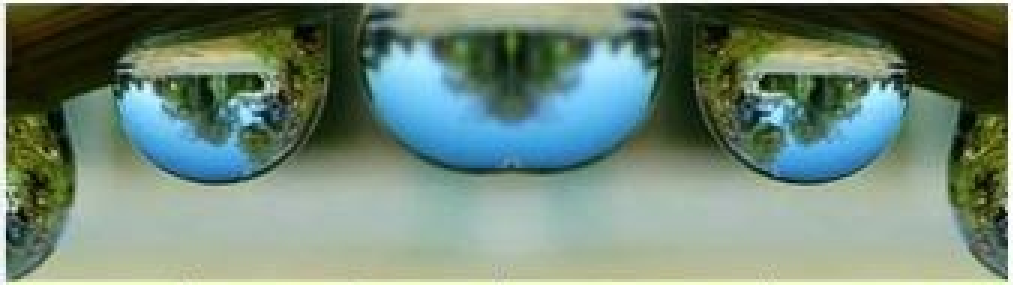
ESC + RA e Shh- diferenciação em NM
dcAMP e Rolipram – superar a inibição do crescimento neural
GDNF (NSC) – direcionamento neural para os músculos

Ann Neurol. 2006 Jul;60(1):32-44.

http://www.cbsnews.com/sections/i_video/main500251.shtml?id=1736310n

CHINASTEMCELLNEWS

BRINGING THE LATEST RESEARCH AND TREATMENTS TO YOU.



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Conferences | Links

REASON FOR COMING FOR TREATMENT: In 1995, when Razvan was in high school, he had a terrible accident when diving into a river. He was paralyzed from the neck down. The only thing he could move at that point was his eyes. Within 24 hours, he was operated on by Dr. Gh. Panoze. Since 1995, he has had daily rehabiliation (kinetotherapy, physiotherapy, massage, and accupuncture) at the Medical Physical Recovery Section of Poiana Campina Hospital.

DIAGNOSIS: C5-C6 Incomplete Spinal Cord Injury

He could move all parts of his arms except for his fingers. He could raise his hands up almost to shoulder height. He could stand up on his feet with support. He had sensation down to his chest (almost 50% for touch and temperature). He could hold his urine for a few seconds before he had to go.

TREATMENT: Umbilical Cord Stem Cell Injections with Nerve Growth Factor.

http://www.Stem Cells - China Stem Cell News - Home.htm

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