



# **Célula-Tronco: uma perspectiva promissora no tratamento da ELA**

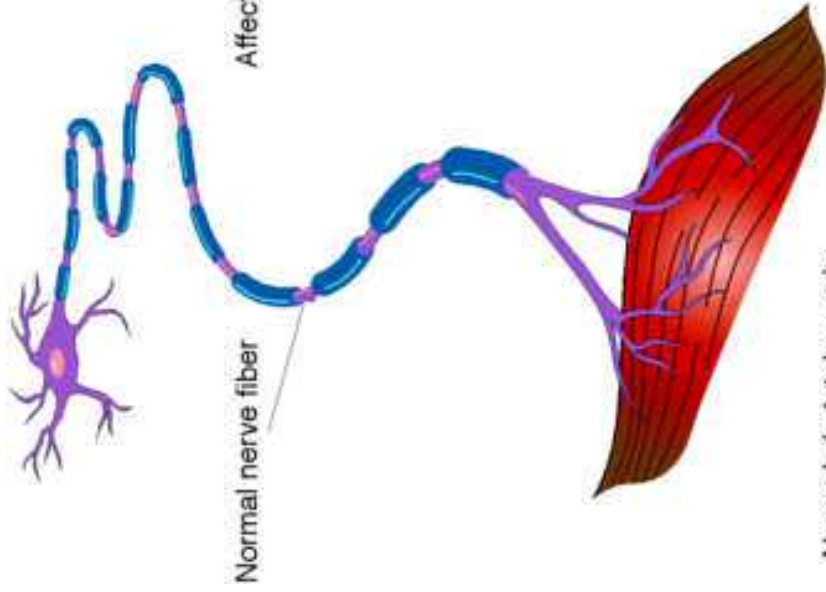
## **Onde estamos**

**Gerson Chadi. MD. PhD.  
Departamento de Neurologia  
Faculdade de Medicina da USP  
gerchadi@usp.br**

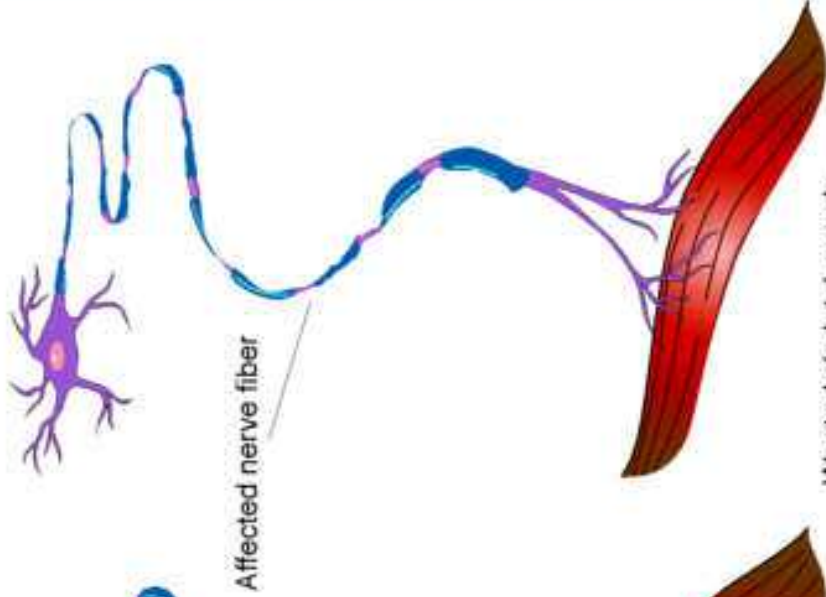
***Dia Nacional de Luta Contra a ELA. Câmara dos Deputados. 2017***

professional illness medical  
 medical health disorder  
 Amyotrophic  
 Sclerosis  
 Lateral  
 disease care Gehring  
 Lou neuron

NORMAL SPINAL NEURON



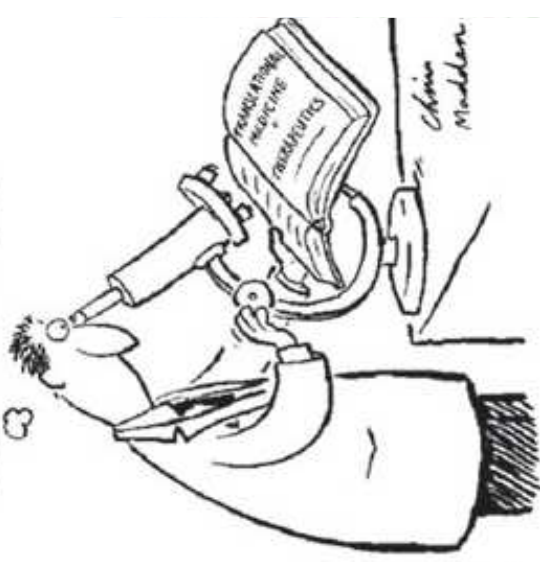
DISEASED SPINAL NEURON



# AMYOTROPHIC LATERAL SCLEROSIS

DIFFICULTY  
 CHARGOT  
 DISORDI  
 SS STIFF  
 MAGNASTE

It's all becoming clear now that I can get it into focus



cells  
 analysis  
 therapy bone  
 development  
 associated with  
 response  
 cancer  
 patients

# MARCOS NA ELA EM INTERVALOS DE 70 ANOS

Descobrimento  
Perseverança

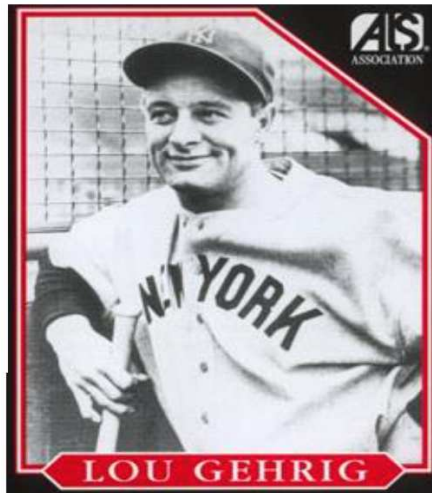
1868



Dr. Jean-Martin Charcot

Desesperança

1938

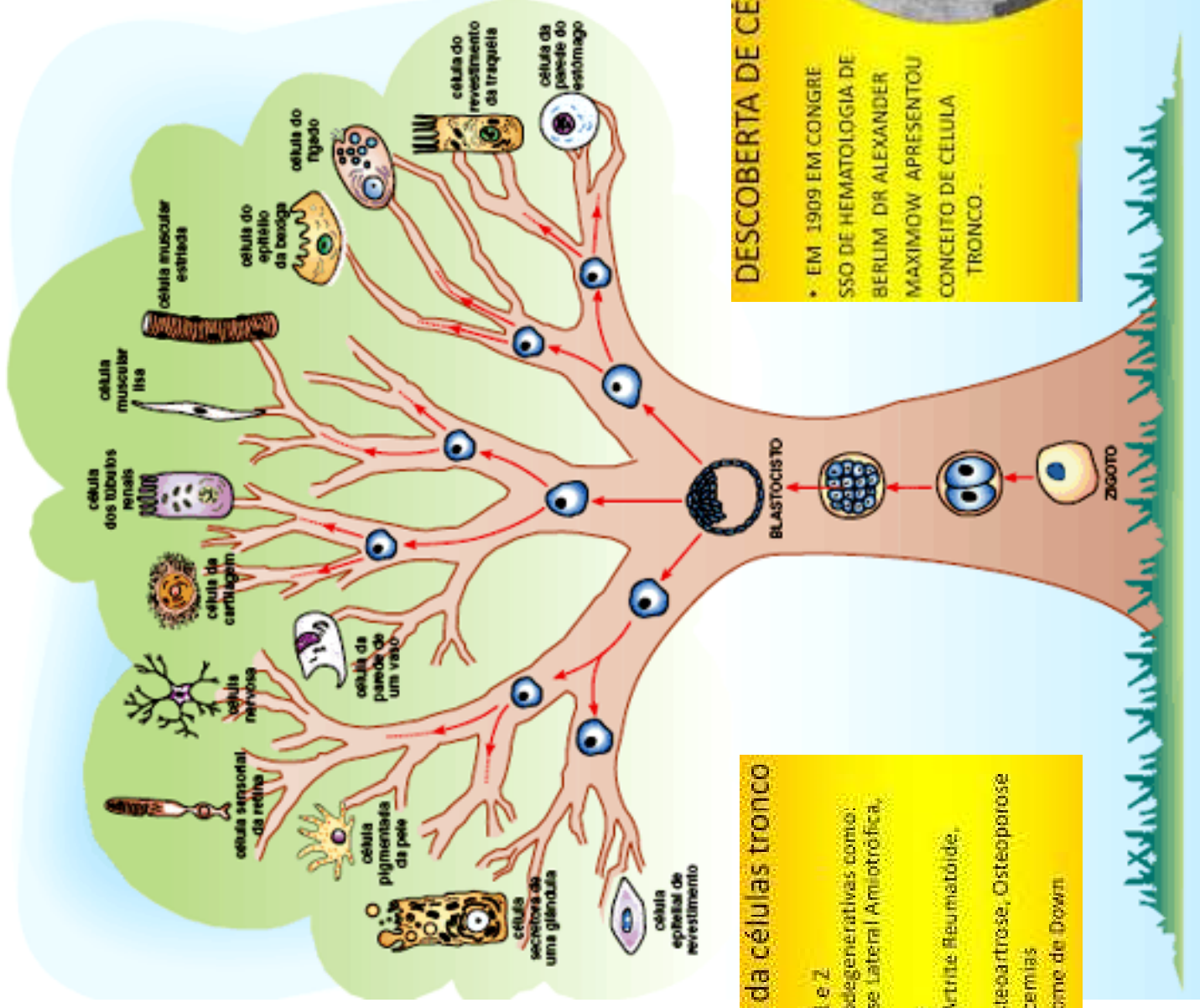


Despertar da  
Esperança

2014



	%
<b>Autologous Bone Marrow-derived Stem Cell</b>	<b>30</b>
<b>Autologous Mesenchymal Stem Cell</b>	<b>21</b>
<b>Autologous Mesenchymal Bone Marrow Stromal Cells Secreting NTFs</b>	<b>14</b>
<b>Human Spinal Cord Derived Neural Stem Cell</b>	<b>7</b>
<b>Granulocyte Colony Stimulating Factor (GCSF)</b>	<b>7</b>
<b>Autologous Bone Marrow-derived Stem/Progenitor Cells</b>	<b>3</b>
<b>Umbilical Cord Mesenchymal Stem Cells</b>	<b>3</b>
<b>Hematopoietic Stem Cells in Patients</b>	<b>3</b>
<b>Human Neural Stem Cell</b>	<b>3</b>
<b>Mesenchymal Stem Cell</b>	<b>3</b>
<b>LA-haplo Matched Allogenic Bone Marrow Derived Stem</b>	<b>3</b>
<b>Glycosides(CTG)</b>	<b>3</b>



### Potencial terapêutico da células tronco

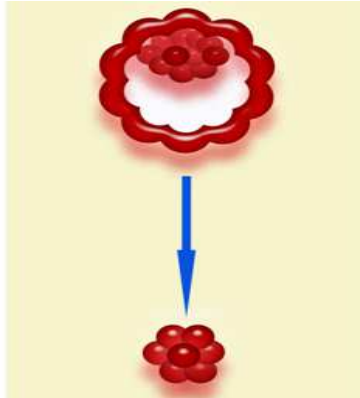
- Tratamento de diabetes tipo 1 e 2
- Tratamento de doenças neurodegenerativas como: Alzheimer, Parkinson, Esclerose Lateral Amiotrófica, Esclerose Múltipla
- Tratamento para retinopatias
- Doenças autoimunes: Lupus, Artrite Reumatóide, Esclerodermia
- Doenças osteomusculares: Osteoartrite, Osteoporose
- Cânceres hematológicos: Leucemias
- Autismo, Esquizofrenia, Síndrome de Down

### DESCOBERTA DE CÉLULA TRONCO

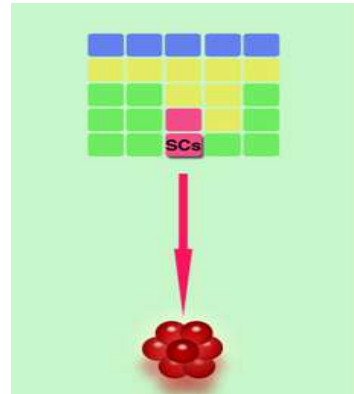
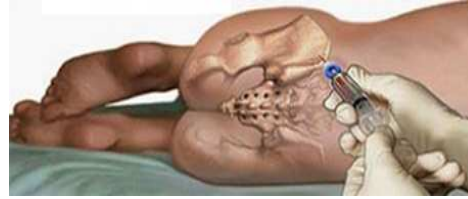
- EM 1909 EM CONGRESSO DE HEMATOLOGIA DE BERLIM, DR ALEXANDER MAXIMOW APRESENTOU CONCEITO DE CÉLULA TRONCO.



# CT Embrionária

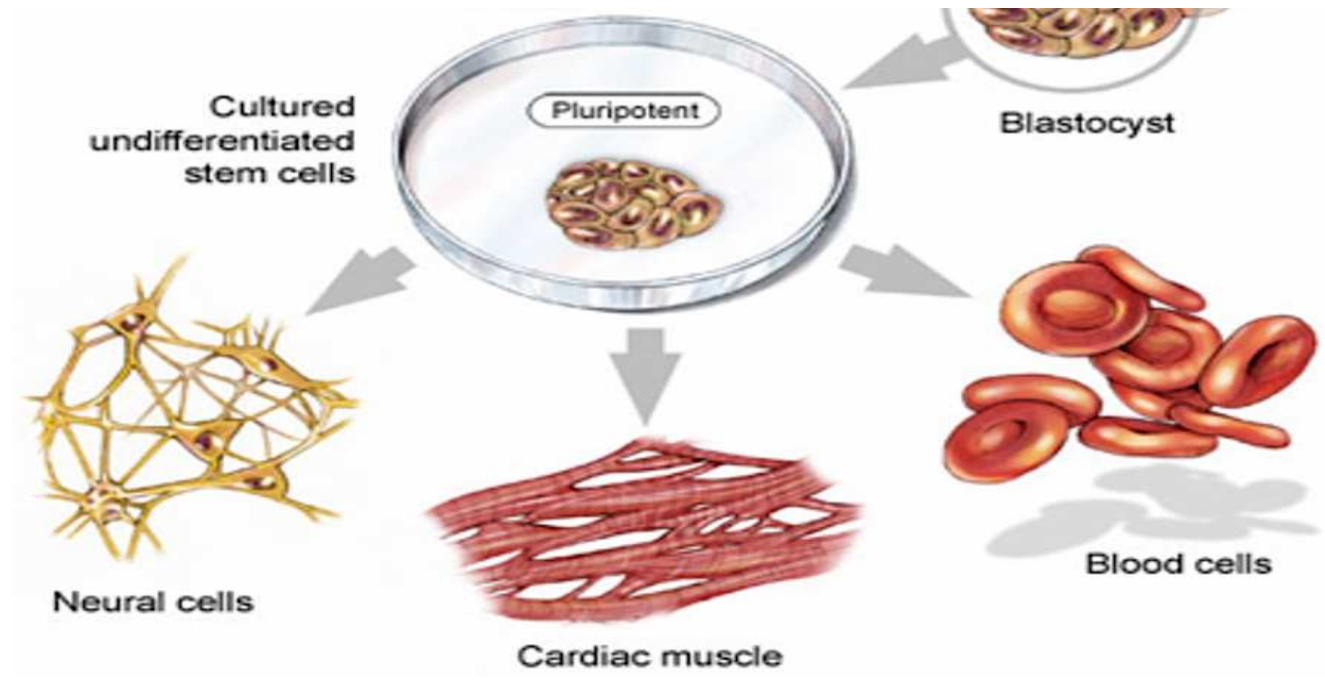
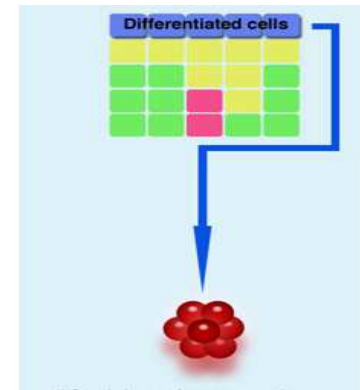


# CT Adulta



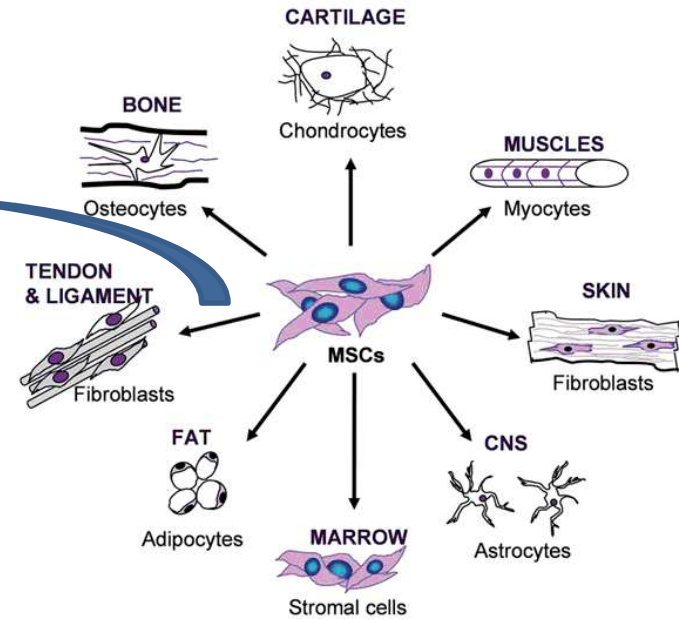
# IPS

## Pluripotente induzida

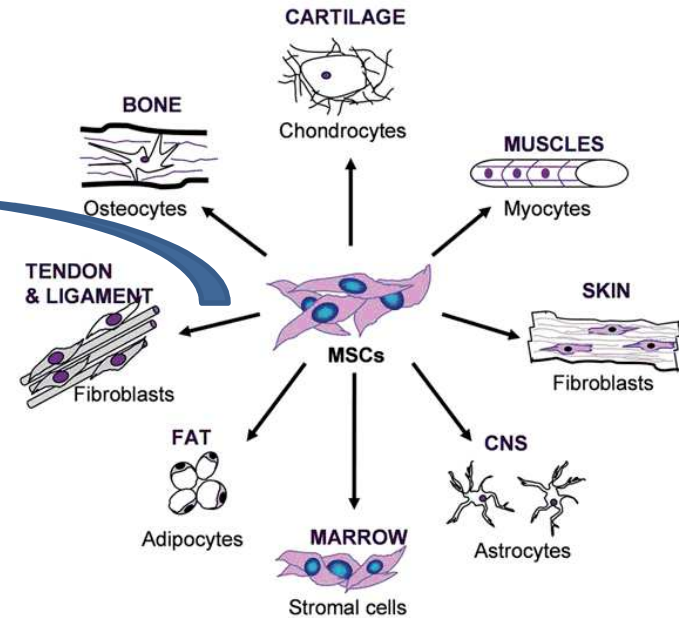


# Células Tronco Mesenquimais

**SECRETAR SUBSTÂNCIAS ATIVAS**



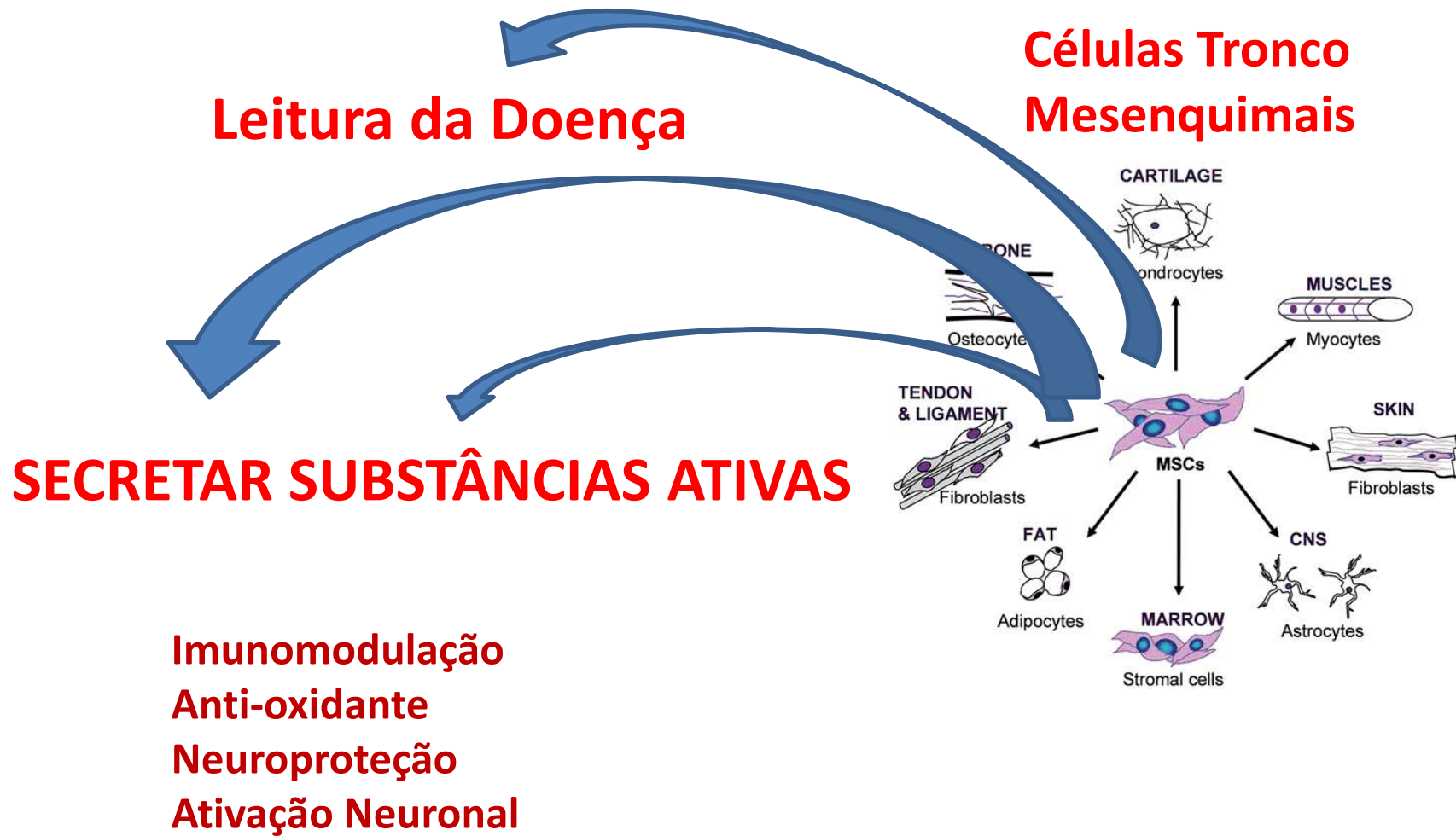
## Células Tronco Mesenquimais

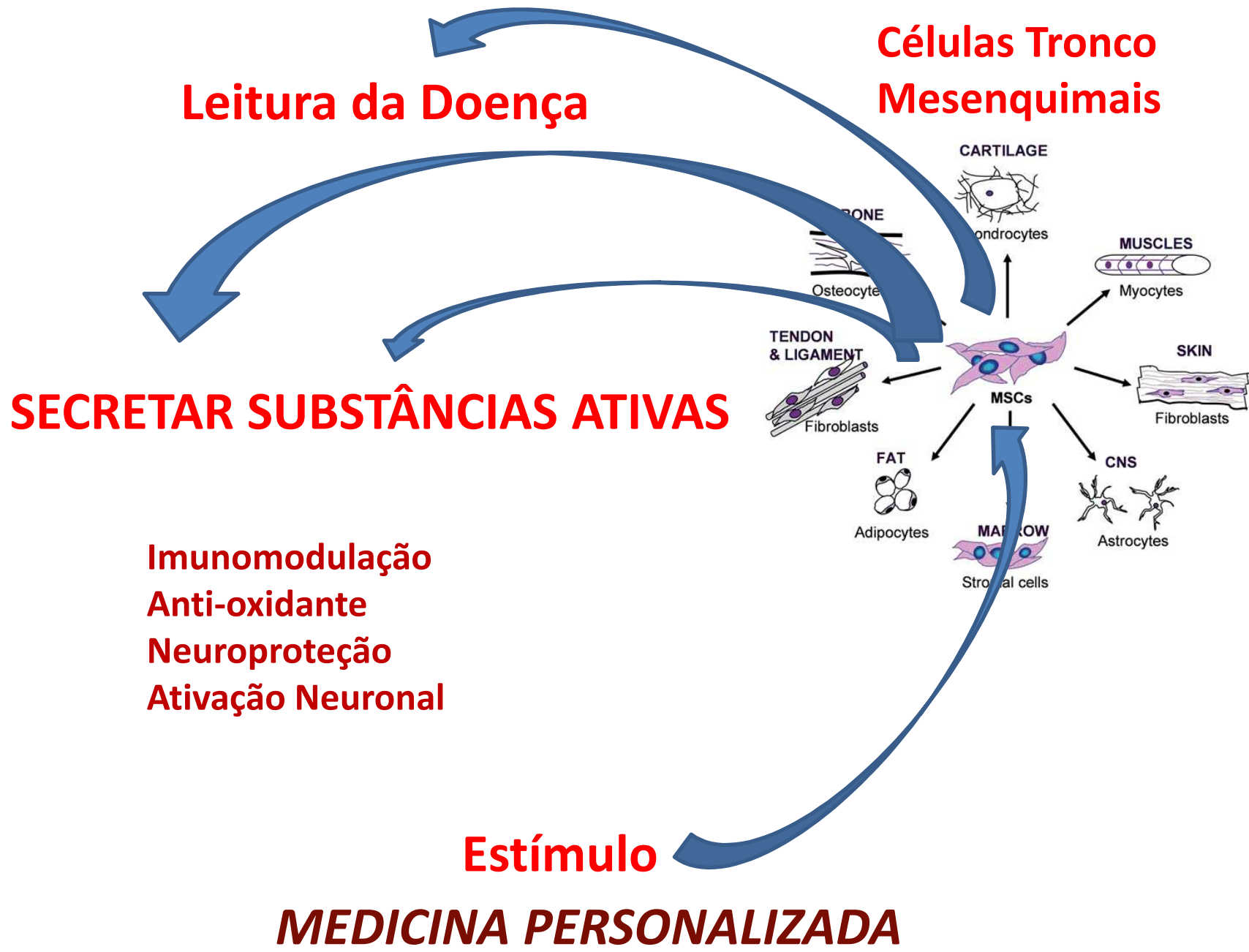


**SECRETAR SUBSTÂNCIAS ATIVAS**

**Imunomodulação**  
**Anti-oxidante**  
**Neuroproteção**  
**Ativação Neuronal**







**Células Tronco Mesenquimais**

**Leitura da Doença**












**SECRETAR SUBSTÂNCIAS ATIVAS**

- Imunomodulação**
- Anti-oxidante**
- Neuroproteção**
- Ativação Neuronal**

**Estímulo**

**MEDICINA PERSONALIZADA**

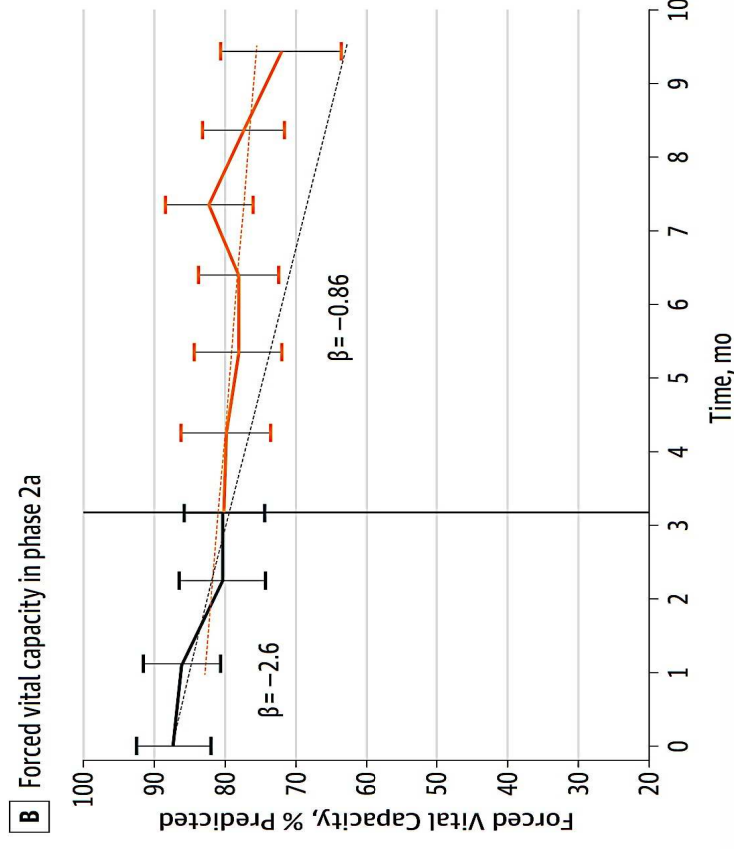
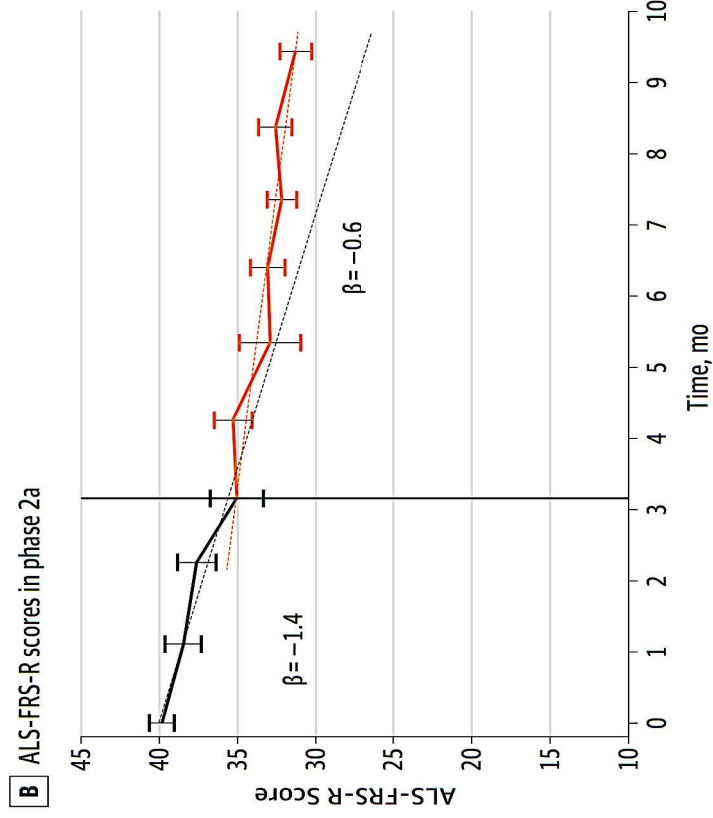
# Levantamento CTM ELA

-  ALS Pathogenesis and Therapeutic - role of stem cells and extracellular vesicles.pdf
-  Intraspinal Neural Stem Cell transplantation in ALS - Phase 1.pdf
-  Safety and Clinical Effects of Mesenchymal Stem Cells, NTF and ALS - Supplementary.pdf
-  Safety and Clinical Effects of Mesenchymal Stem Cells, NTF and ALS.pdf
-  Safety and Clinical Effects of Mesenchyma...lls, NTF and ALS.pdf.sb-b5e6fe7d-xScyq0
-  Safety of intrathecal autologous adipose derived mesenchymal cells in patients ALS.pdf
-  Stem cells for ALS- An overview of possible therapeutic approaches.pdf
-  The Use of Autologous Mesenchymal Ste...Amyotrophic Lateral Sclerosis in Belarus.pdf
-  Transplantation of autologous peripheral blood mononuclear cells in 14 patients ALS.pdf
-  Transplantation of Mesenchymal Stromal...ts With Amyotrophic - results phase I Ila.pdf
-  Transplantation of spinal cord-derived neural stem cells for als.pdf

Original Investigation

# Safety and Clinical Effects of Mesenchymal Stem Cells Secreting Neurotrophic Factor Transplantation in Patients With Amyotrophic Lateral Sclerosis Results of Phase 1/2 and 2a Clinical Trials

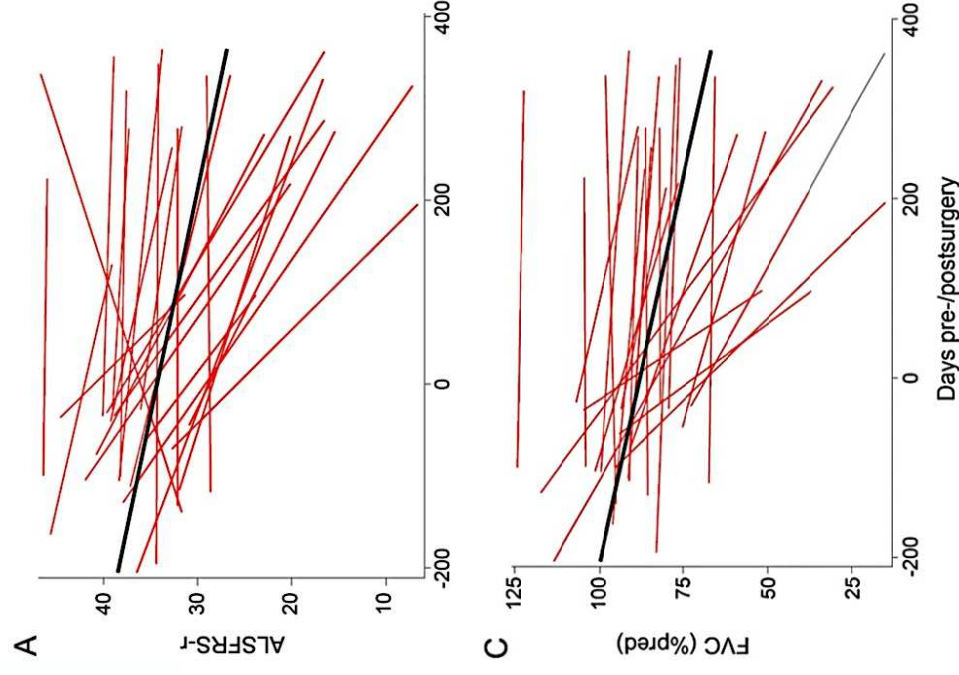
Panayiota Petrou, MD; Yael Gothelf, PhD; Zohar Argov, MD; Marc Gotkine, MD; Yossef S. Levy, PhD; Ibrahim Kassis, PhD; Adi Vaknin-Dembinsky, MD;  
Tamir Ben-Hur, MD; Daniel Offen, PhD; Oded Abramsky, MD; Eldad Melamed, MD<sup>†</sup>; Dimitrios Karussis, MD, PhD



# Transplantation of spinal cord–derived neural stem cells for ALS

## Analysis of phase 1 and 2 trials

Jonathan D. Glass, MD\*  
Vicki S. Hertzberg, PhD\*  
Nicholas M. Boulis, MD  
Jonathan Riley, MD  
Meraida Polak, RN  
Jane Bordeau, RN  
Christina Fournier, MD  
Karl Johé, PhD  
Tom Hazel, PhD  
Merit Cudkowicz, MD  
Nazem Atassi, MD  
Lawrence F. Borges, MD  
Seward B. Rutkove, MD  
Jayna Duell, RN  
Parag G. Patil, MD  
Stephen A. Goutman,  
MD  
Eva L. Feldman, MD,  
PhD

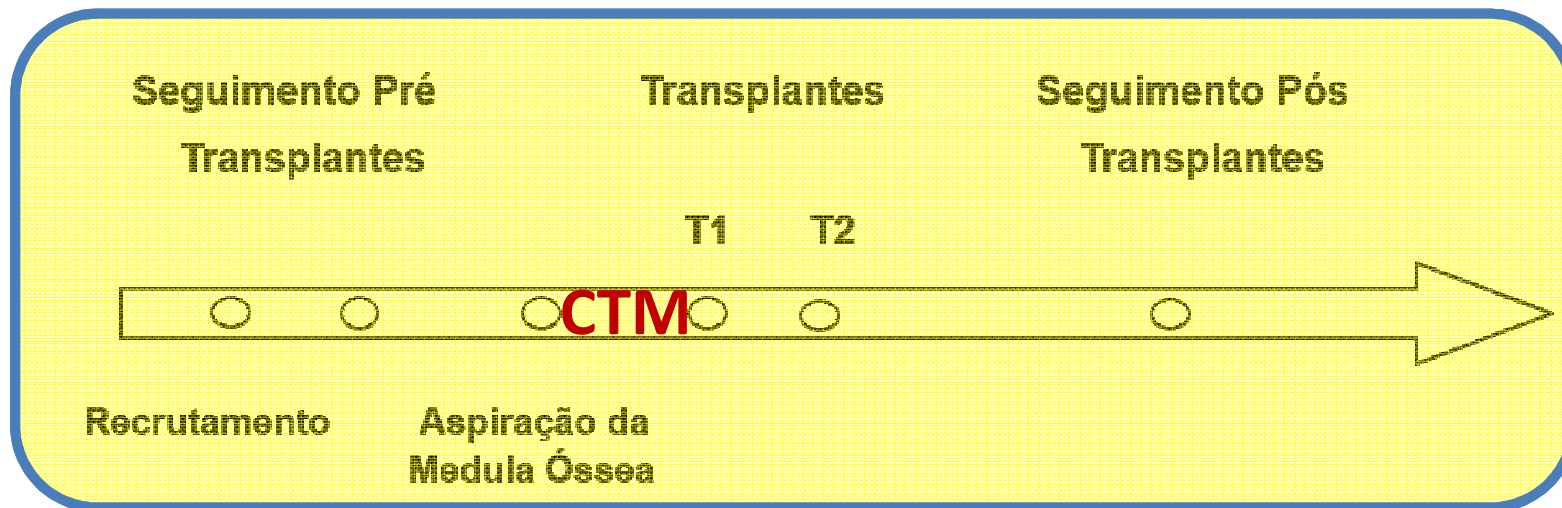




**Estudo fase 1/2 da segurança e eficácia de duas doses intratecais de células-tronco mesenquimais autólogas (CTM), obtidas de células estromais da medula óssea, em pacientes com Esclerose Lateral Amiotrófica**

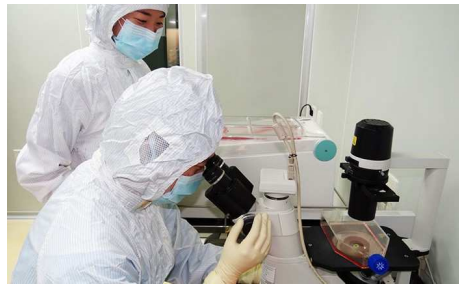
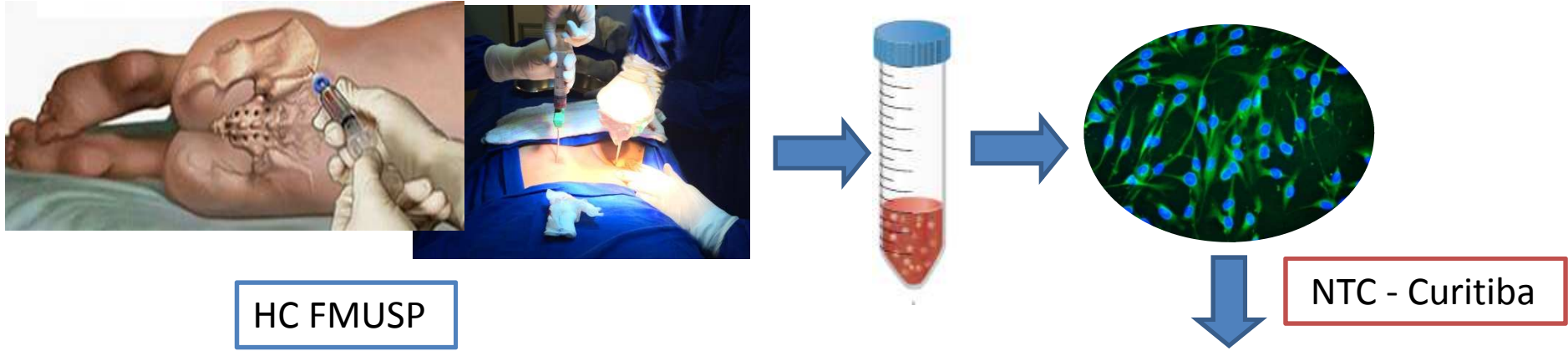
**Financiado pelo Ministério da Saúde e CNPq**

**PRIMEIRO INSTITUCIONALIZADO PARA DOENÇA NEURODEGENERATIVA NO PAÍS**

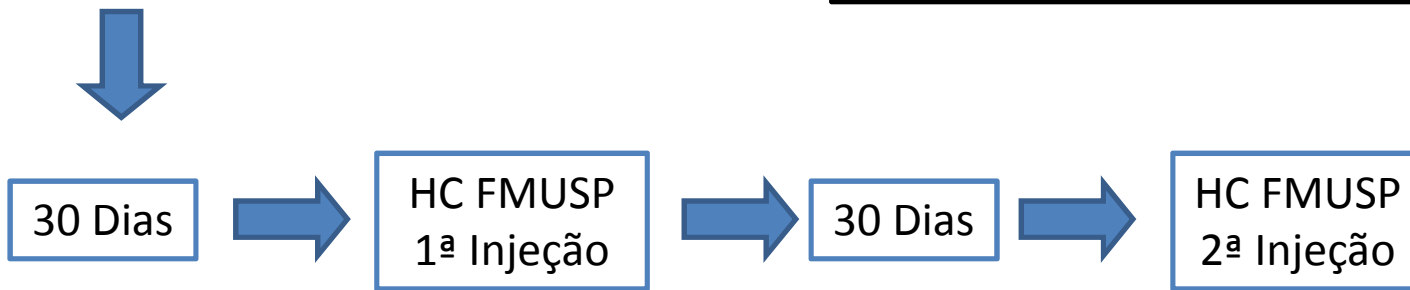
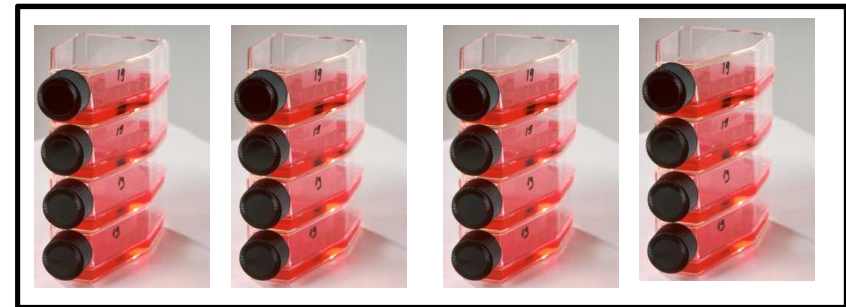




# Ensaio CT ELA. Projeto ELA Brasil. FMUSP



ANVISA







**IDENTIFICAÇÃO:** 08.EMAM.010

**AMOSTRA:** Células-tronco mesenquimais derivadas da medula óssea – P3

**RESULTADO:** CD105 – 91,2 %

CD73 – 84 %

CD90 – 97,9 %

CD29 – 97,5 %

CD166 – 84,6 %

CD14 – 3,78 %

CD34 – 0,22 %

CD45 – 2,74 %

CD19 – 2,97 %

HLA-DR – 0,69 %

#### VIABILIDADE CELULAR

**TÉCNICA:** CITOMETRIA DE FLUXO

Curitiba, 22 de maio de 201

**IDENTIFICAÇÃO:** 08.EMAM.010

**AMOSTRA:** Células-tronco mesenquimais derivadas da medula óssea – P3

**RESULTADO:** 7AAD - 10,1 % – Viabilidade: 89,9 %

ANEXINA - 3,75 %

**-Citogenética MO**

**-Citogenética CTM**

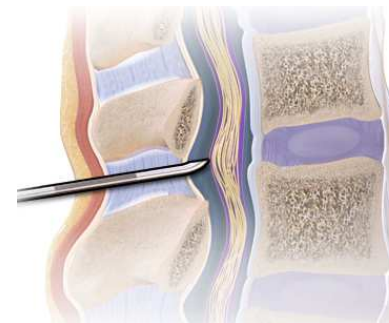
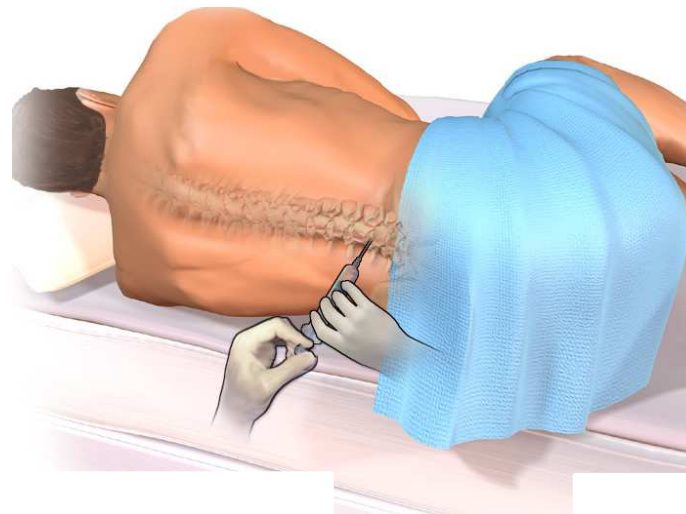
**-Dosagem de endotoxina**

**-Microbiológicos I, II, III**

**-Micoplasma**

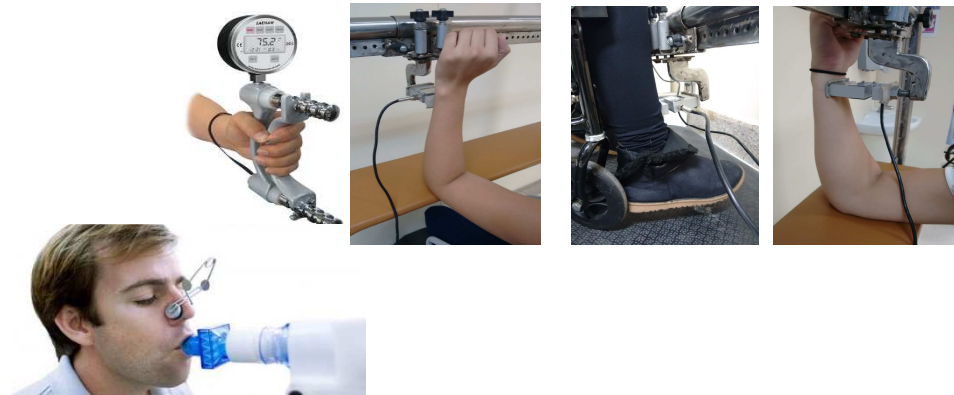
**-Cultura, Antibiógrama 14 dias**

## Infusão Intratecal ESA por Punção Lombar $10^6$ CTM / Kg



# Projeto CT – ELA da FMUSP

Medidas de Força Muscular

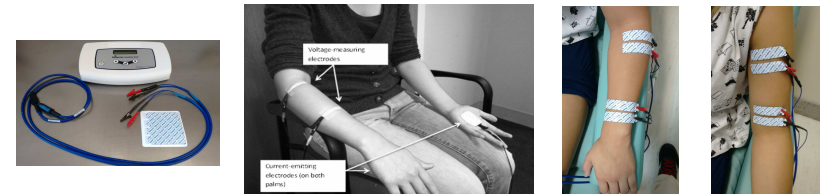


Função respiratória

Força língua, pálato, bochecha



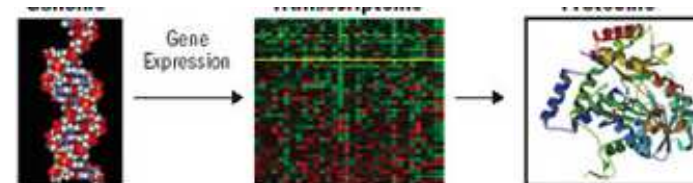
Miografia por Impedância Elétrica



Neuroimagem de última geração



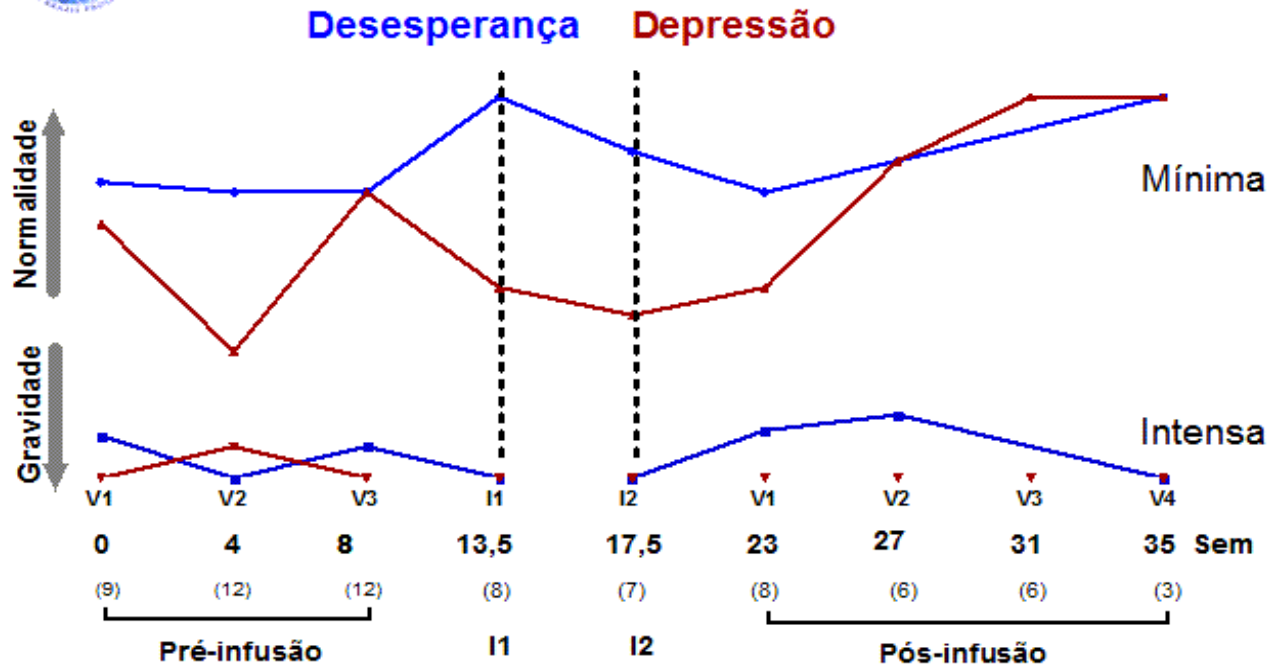
Análises Moleculares no Liquor



**PROJETO ELA BRASIL da FMUSP Discutirá em Brasília o IMPACTO POSITIVO DA REALIZAÇÃO de ESTUDOS CLÍNICOS aos PACIENTES com ELA**

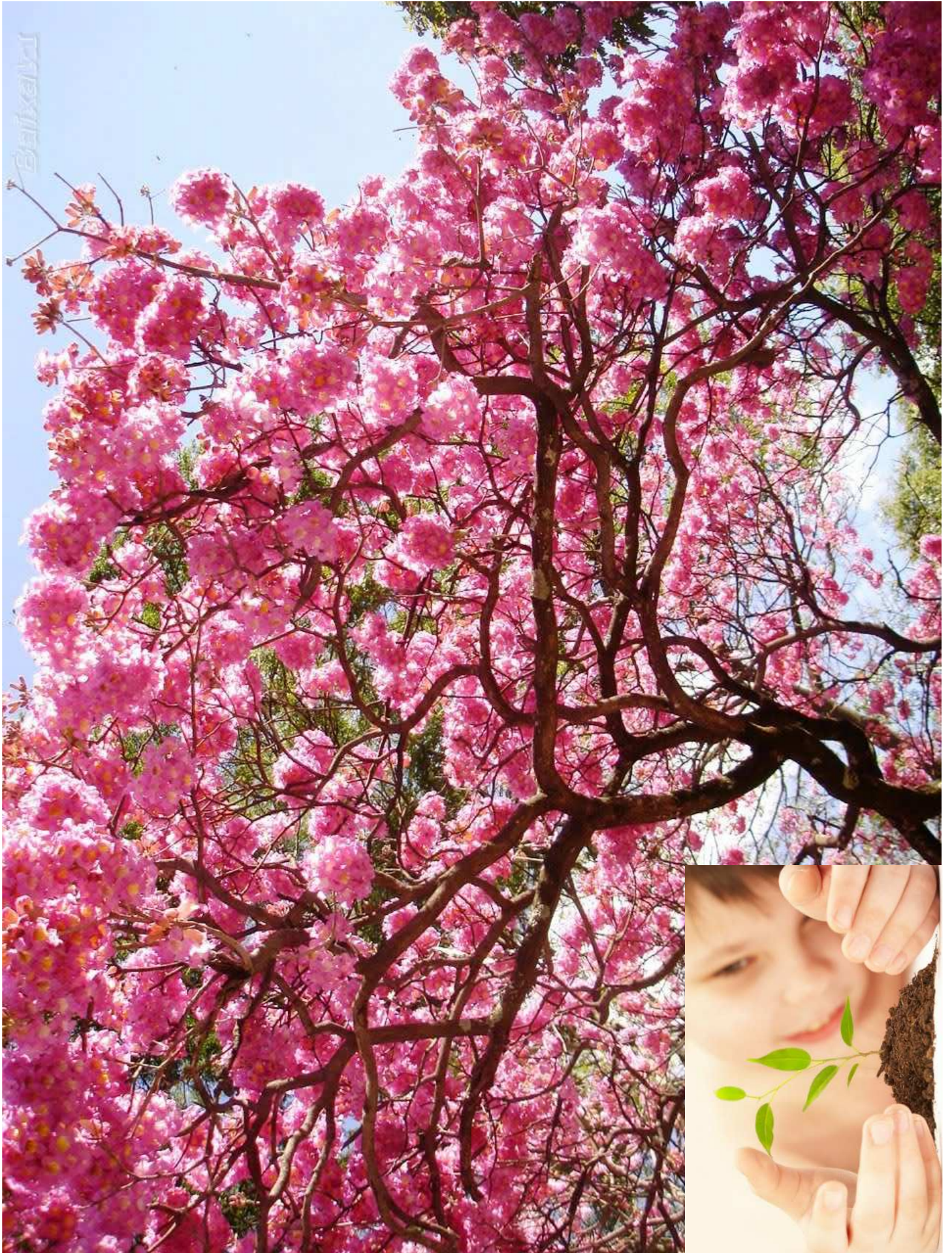


**Ensaio Clínico Célula-Tronco Mesenquimal - ELA**



Resultados Parciais do Ensaio CT-ELA em Execução no HC FMUSP  
Impacto Positivo da Realização do Estudo ao Paciente ELA, refletindo nos Níveis de Desesperança/Depressão e indiretamente na Qualidade de vida.

Psicólogas Maiara G Gedo e Mirian A Oliveira  
PROJETO ELA BRASIL. FMUSP. [www.projetoelabrasil.com.br](http://www.projetoelabrasil.com.br)





## EQUIPE DO PROJETO ELA BRASIL

[www.projetoelabrasil.com.br](http://www.projetoelabrasil.com.br)

