

**INSTITUTO DE NEUROLOGIA  
DEOLINDO COUTO – UFRJ**

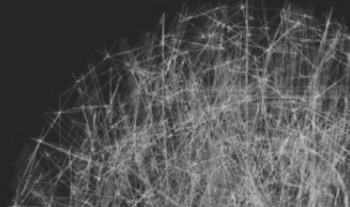
**DIRECTOR: JOSE LUIZ SA CAVALCANTE**



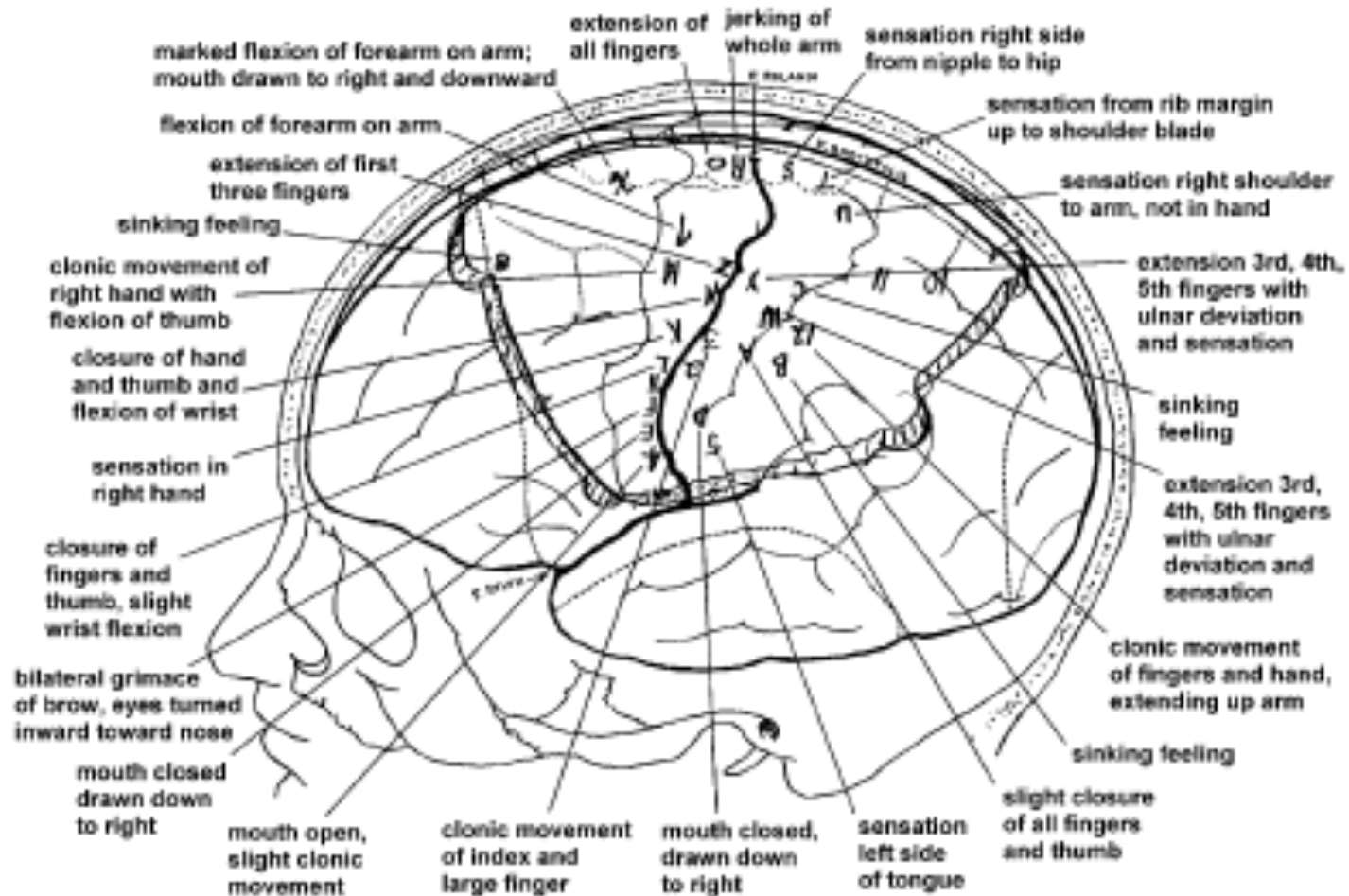
## **Laboratory of Neuroscience and Rehabilitation**



**NeuroMat**



# THE BODY IN THE BRAIN: MAPS IN THE HUMAN SENSORIMOTOR CORTEX



Courtesy of the Penfield Archive (Montreal Neurological Institute, Dr. William Feindel, Curator).  
From Schieber, 2001

# ANATOMY OF AN EPIDEMICS

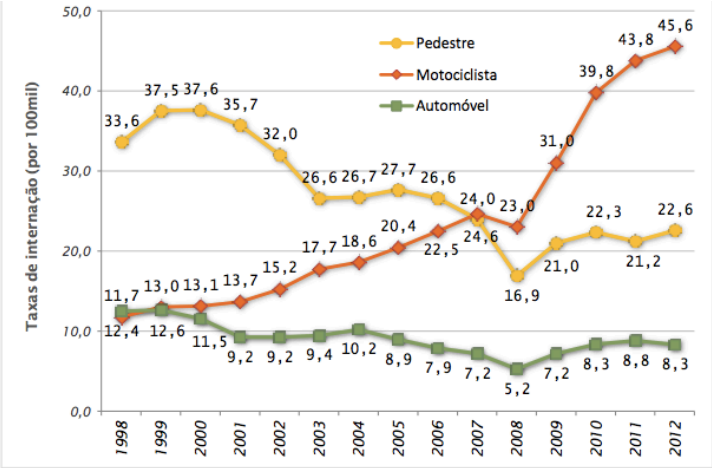
**MAPA DA VIOLÊNCIA 2013**  
**Acidentes de Trânsito e Motocicletas**

Julio Jacobo Waiselfisz

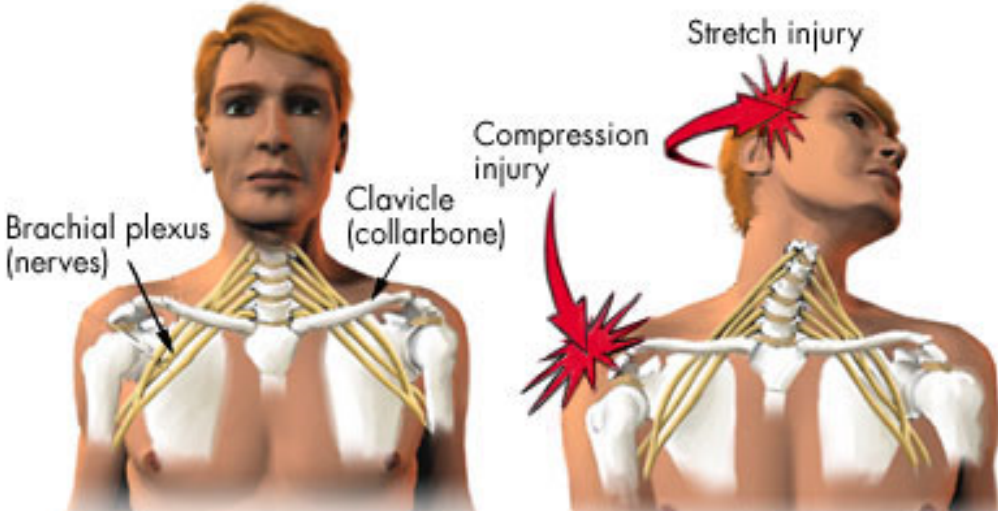
**CEBELA**  
 Centro Brasileiro de  
 Estudos Latino-Americanos

**FLACSO**  
 BRASIL

www.flacso.org.br



Fonte: SIH/ATABNET/MS



Fonte: SIM/SVS/MS

# DEVASTATING SENSORIMOTOR LOSS WITH HIGH FUNCTIONAL INCAPACITY OF THE UPPER LIMB



**SURGICAL RECONSTRUCTION & PHYSICAL THERAPY**



ELSEVIER

Contents lists available at ScienceDirect

NeuroImage: Clinical

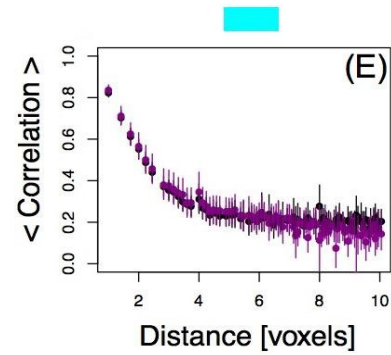
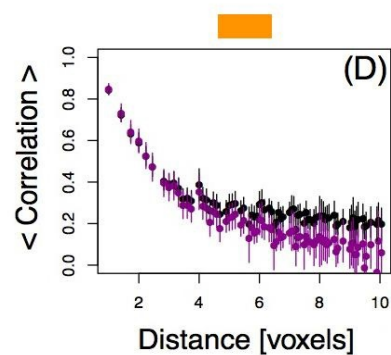
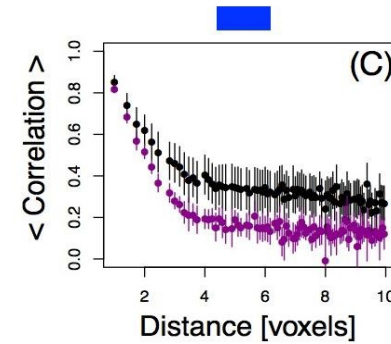
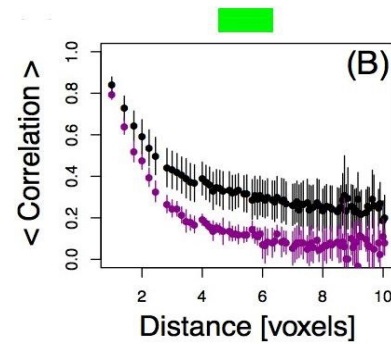
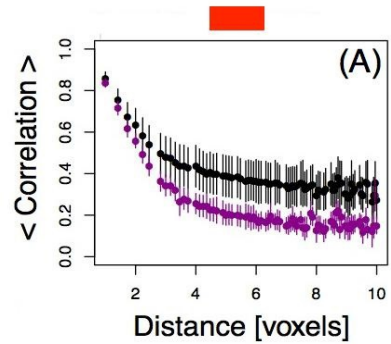
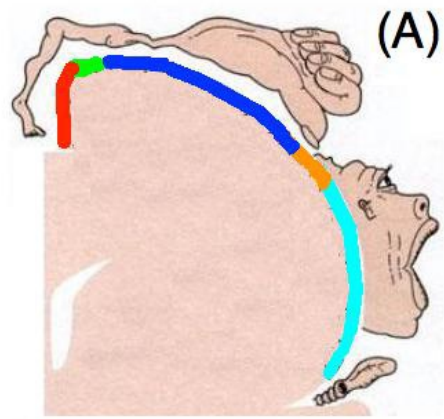
journal homepage: [www.elsevier.com/locate/ynicl](http://www.elsevier.com/locate/ynicl)



## Reduced functional connectivity within the primary motor cortex of patients with brachial plexus injury



D. Fraiman<sup>a,b,1</sup>, M.F. Miranda<sup>c,1</sup>, F. Erthal<sup>i,k</sup>, P.F. Buur<sup>d</sup>, M. Elschot<sup>d</sup>, L. Souza<sup>i,k</sup>, S.A.R.B. Rombouts<sup>e,f,g</sup>, C.A. Schimmelpenninck<sup>g,h</sup>, D.G. Norris<sup>d,i</sup>, M.J.A. Malessy<sup>h</sup>, A. Galves<sup>c</sup>, C.D. Vargas<sup>j,k,\*</sup>



● Healthy Controls



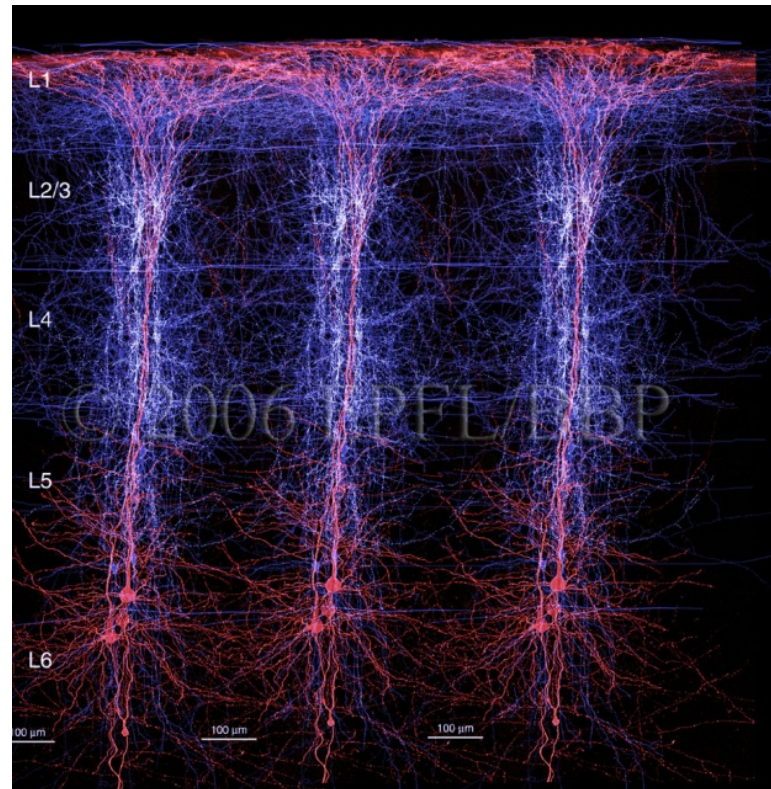
● Brachial Plexus Lesion R

# •MECHANISMS OF PLASTICITY

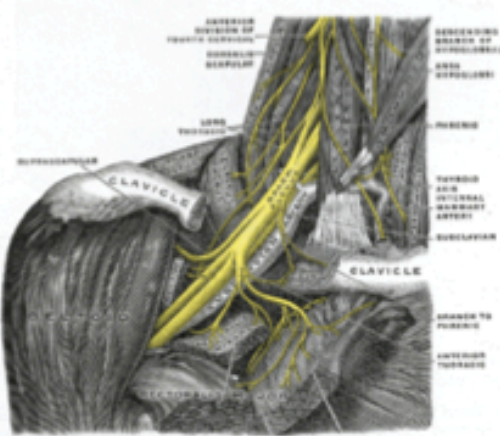
•UNMASKING OF PRE EXISTING CONNECTIONS

•INTRACORTICAL SPROUTING, BOTH WITHIN AND BEYOND THE FRAMEWORK OF THE PREEXISTING CONNECTIONS.

•REDUCED CORTICAL INHIBITORY CIRCUITS (Chen et al., 1998)



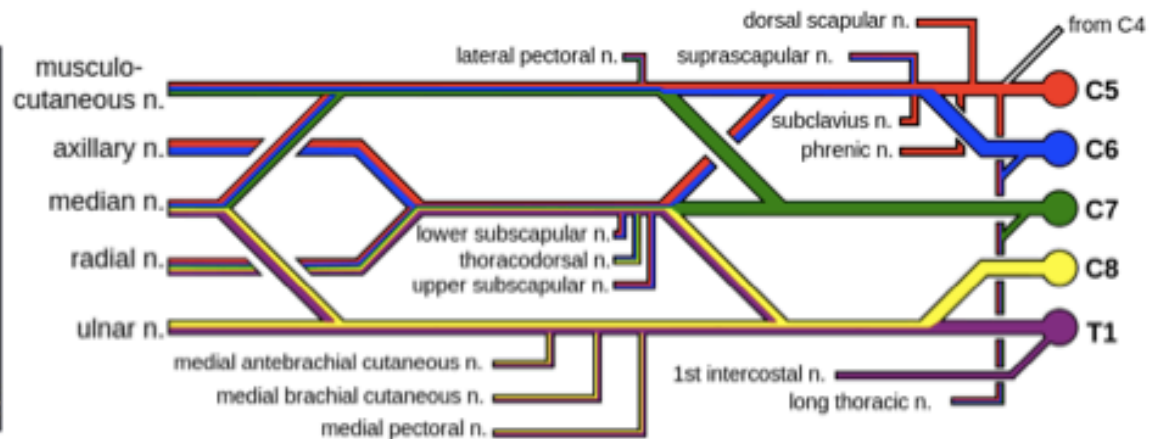
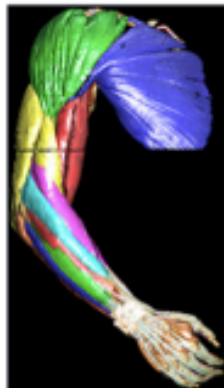
# SOME GOALS FOR THE NEXT YEARS



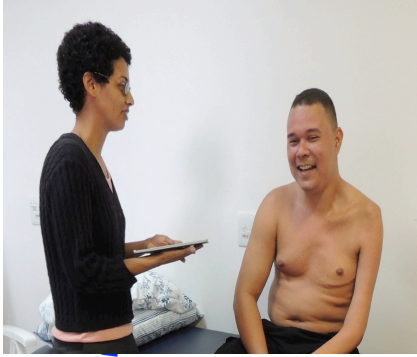
- ❖ Build a virtual databank
- ❖ Investigate cortical plasticity through EEG, TMS, MRI
- ❖ Develop mathematical modeling of cortical reorganization

## ❖ Rules of cortical plasticity?

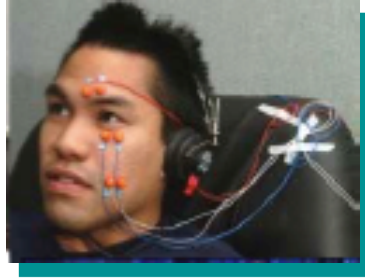
Wikipedia, brachial plexus



Subjective report



somatic

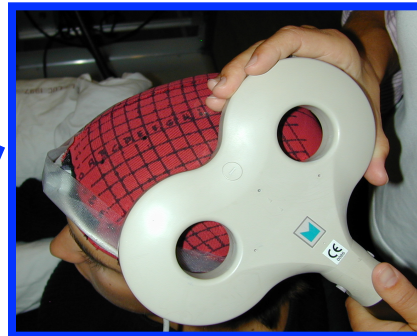
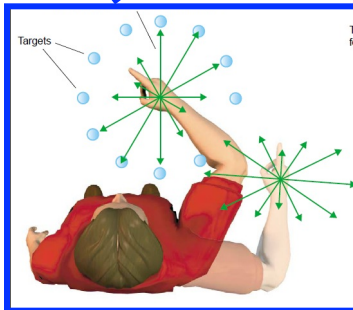


Posturography  
&  
Kinematics

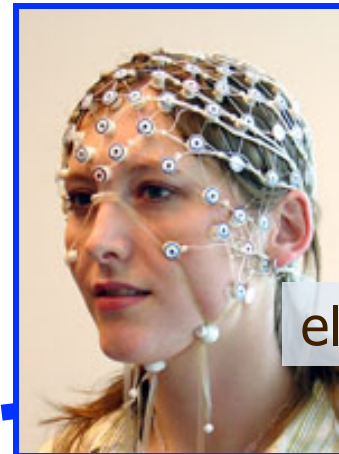


**TRACKING PLASTICITY MECHANISMS AFTER A BRACHIAL PLEXUS INJURY**

Motor performance



Transcranial magnetic stimulation



electroencephalography



Brain imaging





Núcleo de Pesquisa  
em  
Neurociência e  
Reabilitação

Jose Vicente Martins, Gabriel Freire, Juliana Maia,  
Fernanda Torres, Maria Luiza Rangel, Cissa Nunes Soares

NeuroMat

