The research is based on a better understanding of the mechanisms involved in motor plasticity, that is to say the ability for maintaining adapted behaviour despite the existence of durable modifications in sensorimotor processes.

Experiments in the laboratory are performed in animals and in humans. Plasticity in the neuromotor system initiates adaptation processes which gradually allows motor command adjustments following physiological modifications (hyper or hypoactivity, central or peripheral lesion, experimental perturbations).

Hence, physical activity here is considered as a truly effective remedy, facilitating the processes involved in learning, planning movements and in sensorimotor feedback reorganization. Surprisingly, for such a simple remedy, the effective use of physical activity as a therapeutic agent is not well understood. The mechanism of action, the dosage, the guidelines for usage and the precautions to be taken remain to be defined.

Our goal is to better understand motor functions and its deficiency in order to better evaluate the consequences of physical activity and to validate rehabilitation programs and prosthetic equipment.
Partnerships and collaborations
Université de Genova: La collaboration porte sur la modélisation de la fonction motrice et de son implantation en robotique. Un projet de constitution d'un LEA est en cours. Une extension de ce projet a une étude en IRMf a débutée en juin 2008.
University of Ferrara: The topic of this collaboration is to better understand the role of cortical areas in the controle of overt and covert movement. Plasticity of these structure are also studied during learning through observation, physical training and explicit motor imagery.
University of Rio de Janeiro: granted by the CAPES Cofecub for 2 years. One Phd is presently co supervised by the 2 universities. Topic: to developp methods and protocols with EEG to study motor inference and action to perception linkage.

Clinical and public health transfer
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Technology transfer
Development of new tools for motor rehabilitation by explicit and implicit motor imageries (Project, Tecsan/ANR)

Key publications
Perrot O, Laroche D, Pozzo T, Marie C. Kinematics of obstacle clearance in the rat (2011) ; Behav Brain Res. 224(2):241-9