INSTITUTE OF NEUROSCIENCE – PARMA HEADQUARTER

Title: THE MIRROR MECHANISM

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Grants:
Il Sistema Mirror nell’uomo. Funzioni specifiche e sue alterazioni (funded by Fondazione Cariparma)
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Keywords: action execution, action observation, social cognition, mirror mechanism

Abstract:
The discovery of the mirror mechanism, i.e. the automatic activation of the motor system due to the passive observation of others’ actions, has long been recognized as one of the most important discoveries in the field of cognitive neuroscience. The focus of our project is to investigate how the several nodes of the fronto-parietal mirror mechanism contribute to social cognition, imitation and intention understanding, for (a) investigating the functioning of the mirror mechanism in healthy individuals and (b) providing a basis for translational studies and clinical applications (e.g. neurorehabilitation, neurodevelopmental disorders).

The goal of the project is achieved by a multi-technique approach combining human invasive and non-invasive recordings, including high-density EEG, TMS, fMRI and intracranial sEEG recordings on patients during pre-surgical monitoring.

Particular attention is paid to the fronto-parietal networks processing of complex hand and tool actions, motor learning (see MOTOR LEARNING@IN-CNR), action prediction (see ACTION PREDICTION@IN-CNR) and to the generalization of such mechanism to other domains, including language processing (see NEUROBIOLOGY OF LANGUAGE@IN-CNR) and emotional expressions (see HUMAN EMOTIONS@IN-CNR). Furthermore, translational studies and clinical applications of the mirror mechanism concerns the study of neurodevelopmental disorders, and autism in particular (see SOCIAL AND MOTOR ASPECTS OF ASD@IN-CNR) and the Action Observation Treatment in the domain of motor neurorehabilitation (see AOT FOR MOTOR REHABILITATION@IN-CNR).

Skills/technology: high-density EEG; TMS; intracranial sEEG recording; fMRI; virtual reality.

Publications