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Hemispheric organisation of precision grasping in humans

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ABSTRACT OF THE TALK

Although the crossed organisation of the descending motor pathways is well known, behavioural and neuropsychological evidence have convincingly established that the left hemisphere is dominant for motor skills. However, the specialization of the left hemisphere in motor control is thought to be related to its specialization in language-associated functions and to involve rather high-level processes such as learning, bimanual coordination, tool use…

We have used TMS-induced lesions of distinct cortical areas in order to investigate, in healthy humans, the neural correlates of precision grasping. Particularly, we studied the brain areas responsible for determining both the hand posture appropriate to the object to be grasped and the grip force applied on the object in order to manipulate it securely. We found that, irrespective of the hand used to grasp the object, the neural circuit controlling the grip force is located in the left hemisphere (left AIP and left SMA). In contrast, the hand posture computation seems to rely initially on a bilateral network composed of AIP and PMv, that become more and more lateralized as both the action and the hand selections occur.