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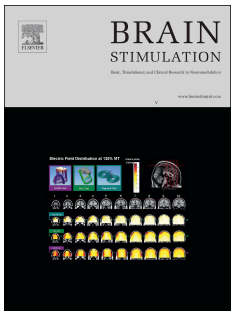


Closed-loop intracranial stimulation alters movement timing in humans

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# Closed-loop intracranial stimulation alters movement timing in humans

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**Abbreviated title: Closed-loop motor system stimulation**

**Keywords**: ECoG, closed-loop, Supplementary motor area

**Number of Figures**: 6

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**Highlights:**

- In humans, the supplementary motor area manifests characteristic neural activity just prior to voluntary movement.
- We developed a closed-loop deep brain stimulation system capable of detecting this activity and stimulating the SMA before movement occurs.
- Stimulation based on closed-loop detection of SMA activity resulted in significant slowing of motor behavior.
- Stimulation using an identical protocol outside the SMA did not result in significant slowing of motor behavior.
- This is the first report of a human closed loop system designed to alter movement using direct cortical recordings and direct stimulation.

The authors declare no competing financial interests.