CRC 1451 - Project B07: Tremor-specific network organisation within the primary motor cortex

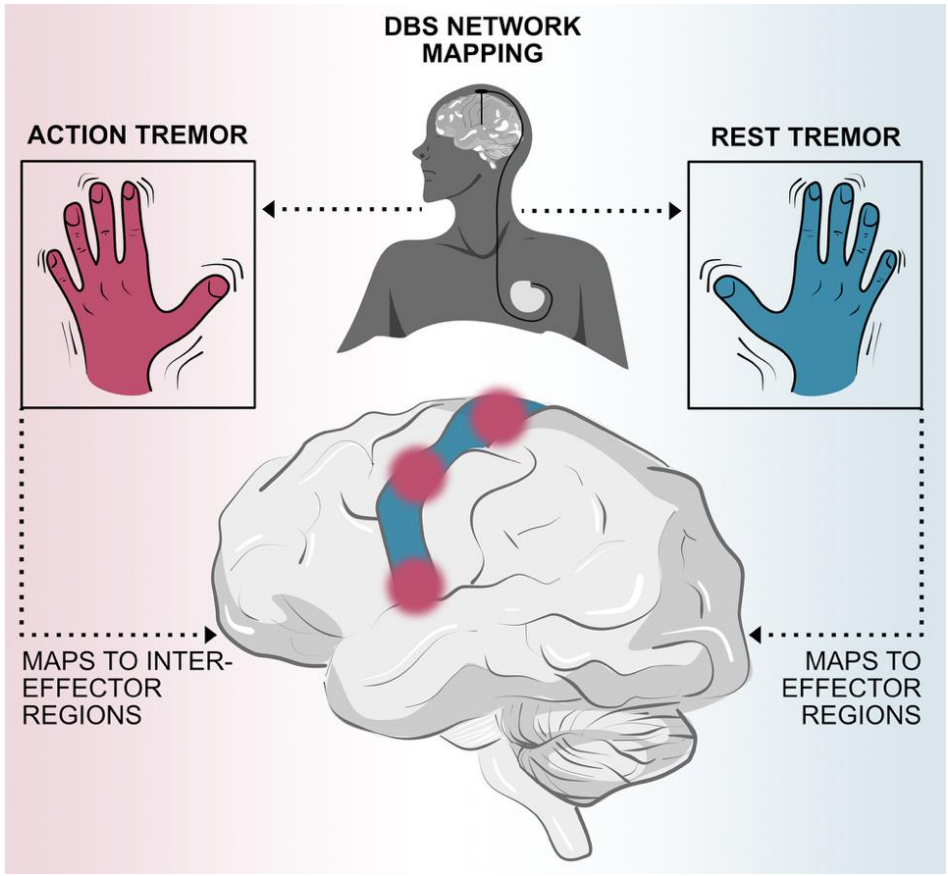
Tremor is a common and disabling symptom in movement disorders such as Parkinson's disease and essential tremor. Although deep brain stimulation (DBS) can strongly reduce tremor, patients often show different responses depending on whether their tremor occurs at rest or during action. In this Cell Reports study, Lukas Goede, Patricia Zvarova, Andreas Horn and colleagues used DBS network mapping across multiple international patient cohorts to ask whether these tremor types rely on the same or different motor-cortical networks.

The study shows that rest tremor and action tremor map to distinct subregions within the primary motor cortex. Rest tremor was more strongly linked to effector-specific motor regions, whereas action tremor preferentially engaged inter-effector regions connected to broader action-control networks. The findings help explain why one stimulation setting may improve one tremor phenotype more than another and point toward more personalised, symptom-specific DBS programming strategies.

Lukas Goede is a clinician scientist at Charite Berlin working on movement disorders, neuromodulation and brain network mapping.

Patricia Zvarova is a PhD researcher in the Network Stimulation Laboratory. Her work focuses on neuroimaging, connectomics and deep brain stimulation.

Andreas Horn is PI in the CRC project B07. His lab develops connectomic methods for mapping and optimizing brain stimulation, including Lead-DBS and DBS network mapping approaches.



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Action and rest tremor map to distinct networks within the primary motor cortex

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