ABSTRACT
Proper movement is composed of motor planning, execution, and termination phases, and dysfunction in any of these phases results in incomplete or improper motor behavior. Importantly, each of these discrete sub-processes is served by a dynamic pattern of oscillatory activity in the human cortex. Magnetoencephalography (MEG) is a completely noninvasive, silent, direct neuroimaging instrument with good spatial accuracy and excellent temporal resolution, which permits recording of oscillatory activity during these movement planning, execution, and termination phases. Recent work from our lab will demonstrate that patients with Parkinson’s disease have a specific deficit in motor planning and execution, and that these oscillatory aberrations may be modified by subtle movement parameters, as well as other endogenous and exogenous factors. How these factors modulate movement-related oscillatory activity may shed light on potential therapeutic targets in Parkinson’s disease and other movement disorders.

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