

Neural Rhythms Drive Reaching Movements | Columbia University Medical Center Newsroom

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Researchers have found that rhythmic firing by groups of motor cortex neurons drives movements such as reaching and grasping. The findings promise to change our basic understanding of the brain's motor cortex.

Until now, neuroscientists have assumed that motor cortex neurons behaved similarly to visual neurons,

which individually map characteristics of external objects such as orientation and brightness. They expected individual motor cortex neurons to map external parameters such as movement direction, distance, and speed. Instead, they found that groups of motor cortex neurons fire rhythmically, sending rhythmic signals down the spinal cord to the muscles.

The research team, led by Mark Churchland, PhD, assistant professor in the department of neuroscience, and former colleagues at Stanford University, looked at the brain activity of monkeys reaching to touch a target. Even though the reaching movement was arrhythmic, the muscle activity that drove the movement was always the sum of two underlying rhythms.

Understanding how these rhythmic patterns drive movement could lead to the development of treatments for motor disorders and technology for controlling prosthetic limbs.

"Neural population dynamics during reaching" was published online on June 3, 2012, in [*Nature*](#).

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