

The matchmaker that maintains neuronal balance

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A protein identified by researchers at Baylor College of Medicine helps maintain a critical balance between two types of neurons, preventing motor dysfunction in mammals.

In a report in the current edition of the journal *Neuron*, Dr. Soo-Kyung Lee, assistant professor of molecular and [human genetics](#), molecular and cellular biology and neuroscience at BCM, and her colleagues describe the [protein](#) LMO4 as critical in allowing progenitor cells to choose their fates - between the V2a [neurons](#) that are excitatory and the V2b neurons that are inhibitory. Excitatory neurons encourage the activity of neurons on which they act. Inhibitory neurons act in an opposite manner.

In previous work, Lee and members of her laboratory identified the double-barreled or dimerized complex containing the protein Lhx3 that pushes the progenitor cells to become V2a excitatory neurons. In this paper, she notes the LMO4 not only forms a complex that binds to DNA and promotes the choice of cell fate to the V2b inhibitory neurons, it also blocks the path to becoming a V2a excitatory neuron.

Because LMO4 cannot bind directly to DNA, it plays [matchmaker](#) instead, building a complex of DNA-binding components that allow the cells to choose to become inhibitory neurons.

"These individual DNA-binding components are present in the neurons," she said. "But they do not have the ability to find their DNA partners. LMO4 'glues' these proteins together and makes them functional."

She and her colleagues have demonstrated these both in the laboratory and in mice bred to lack LMO4. Without the protein, the balance becomes tipped in favor of excitatory neurons, which would result in [motor dysfunction](#).

Others who took part in this research include Kaumudi Joshi, Seunghee Lee, Bora Lee and Jae W. Lee, all of BCM.

Lee credits graduate student Kaumdi Joshi with much of the laboratory work in accomplishing this understanding.

More information: <http://www.bcm.edu/mcb/?PMID=7591>

Source: Baylor College of Medicine ([news](#) : [web](#))

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