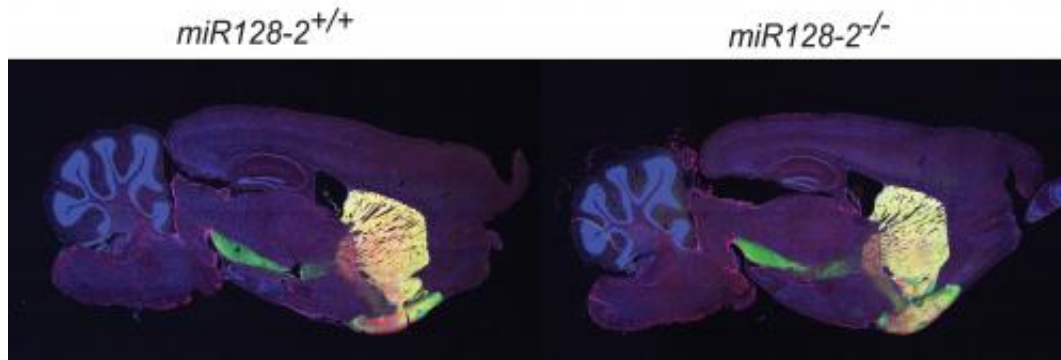


Single microRNA powers motor activity

December 5 2013



Sagittal brain section of a miR-128 deficient mouse. Immunostaining shows normal striatal neurons and their projections to the substantia nigra (green fluorescent protein shown in green) in wild-type and miR-128 deficient mice. Credit: Anne Schaefer

New research from the Icahn School of Medicine at Mount Sinai shows that microRNA-128 is one of the strongest regulators of nerve cell excitability and motor activity, and that it does so by adjusting an entire neuronal signaling pathway. Published online Dec. 6 in the journal *Science*, the preclinical study suggests that developing new drugs for treatment-refractory epilepsy that target the microRNA signaling pathway might prove beneficial for patients with severe epilepsy, including the epilepsy of infancy. MicroRNAs are non-coding RNAs that regulate the translation or degradation of messenger RNA, the essential building blocks for proteins in the cell.

Anne Schaefer, MD, PhD, Assistant Professor, Seaver Fellow, and

recipient of the NIH Director's New Innovator Award 2012 Friedman Brain Institute, Departments of Neuroscience and Psychiatry, at the Icahn School of Medicine at Mount Sinai, and the study's senior author, said that the findings are extremely compelling. "This is the first time that it has been shown that a single microRNA could control complex functions in the adult brain."

The investigators revealed that the expression of a single microRNA, microRNA-128, defined motor activity and exploration in mice. When miR-128 expression was reduced in adult neurons, it led to a dose-dependent increase in motor activity and fatal [epilepsy](#). Overexpression of the miRNA lessens neuronal responsiveness and seizure susceptibility, reduces motor activity, and reduces motor difficulties associated with Parkinson's like disease.

Mount Sinai Innovation Partners is managing the intellectual property for the use of microRNA-128 as a potential treatment for severe and treatment-refractory epilepsy and exploring commercial opportunities for this technology.

More information: Single Neuron Seeks Just the Right Amount of One MicroRNA,

Provided by The Mount Sinai Hospital

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