

Sialic acid: A key to unlocking brain disorders

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A new report published in the July 2015 issue of *The FASEB Journal* suggests that a common molecule found in higher animals, including humans, affects brain structure. This molecule may play a significant role in how brain cells communicate, possibly shedding light on the underlying causes of certain brain disorders. The study, involving mice, shows that small changes in how sialic acid attaches to cell surfaces result in damaging effects on brain structure, poor motor skills, hyperactivity, and difficulty in learning.

"Sialic acid is part of the molecular language that cells use to communicate among themselves," said Ronald L. Schnaar, Ph.D., a senior researcher involved in the work from the Departments of Pharmacology and Neuroscience at Johns Hopkins University School of Medicine in Baltimore, Maryland. "As we learn that language, we can use the knowledge to better understand disease and perhaps to thoughtfully intervene."

To make their discovery, Schnaar and colleagues mutated mouse genes responsible for sialic acid attachment, then compared the [brain structure](#), motor functions, activity, and learning in these mice to that of normal mice. They found that the mice that had altered sialic acid attachment had significant neurological problems when compared to the normal mice.

"The molecular codes that control the [human brain](#) are as yet poorly worked out," said Gerald Weissmann, M.D., Editor-in-Chief of *The*

FASEB Journal. "This report shows how small molecules such as sialic acid direct cell communication to profoundly affect behavior. With this information, researchers have new ways to work out the mechanisms that determine hyperactivity and other [brain](#) disorders."

More information: Seung-Wan Yoo, Mary G. Motari, Keiichiro Susuki, Jillian Prendergast, Andrea Mountney, Andres Hurtado, and Ronald L. Schnaar. Sialylation regulates brain structure and function. *FASEB J.* July 2015 29:3040-3053; [DOI: 10.1096/fj.15-270983](https://doi.org/10.1096/fj.15-270983)

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