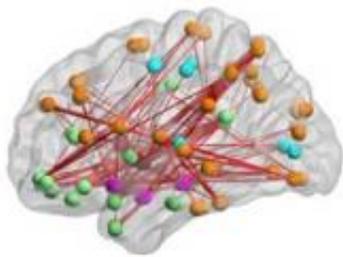


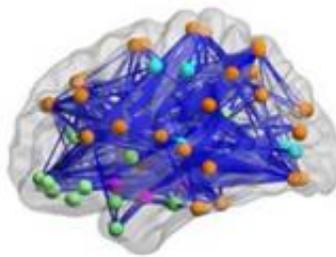
Social symptoms in autistic children may be caused by hyper-connected neurons

November 7 2013

Typically developing children



Children with autism



Credit: *Cell Reports*, Keown et al

The brains of children with autism show more connections than the brains of typically developing children do. What's more, the brains of individuals with the most severe social symptoms are also the most hyper-connected. The findings reported in two independent studies published in the Cell Press journal *Cell Reports* on November 7th are challenge the prevailing notion in the field that autistic brains are lacking in neural connections.

The findings could lead to new treatment strategies and new ways to detect autism early, the researchers say. Autism spectrum disorder is a

neurodevelopmental condition affecting nearly 1 in 88 children.

"Our study addresses one of the hottest open questions in [autism research](#)," said Kaustubh Supekar of Stanford University School of Medicine of his and his colleague Vinod Menon's study aimed at characterizing whole-brain connectivity in children. "Using one of the largest and most heterogeneous pediatric functional neuroimaging datasets to date, we demonstrate that the brains of children with autism are hyper-connected in ways that are related to the severity of social impairment exhibited by these children."

In the second *Cell Reports* study, Ralph-Axel Müller and colleagues at San Diego State University focused specifically on neighboring brain regions to find an atypical increase in connections in adolescents with a diagnosis of [autism spectrum disorder](#). That over-connection, which his team observed particularly in the regions of the brain that control vision, was also linked to symptom severity.

"Our findings support the special status of the visual system in children with heavier symptom load," Müller said, noting that all of the participants in his study were considered "high-functioning" with IQs above 70. He says measures of local connectivity in the cortex might be used as an aid to diagnosis, which today is based purely on behavioral criteria.

For Supekar and Menon, these new views of the autistic brain raise the intriguing possibility that epilepsy drugs might be used to treat autism.

"Our findings suggest that the imbalance of excitation and inhibition in the local brain circuits could engender cognitive and behavioral deficits observed in autism," Menon said. That imbalance is a hallmark of epilepsy as well, which might explain why [children](#) with autism so often suffer with epilepsy too.

"Drawing from these observations, it might not be too far fetched to speculate that the existing drugs used to treat epilepsy may be potentially useful in treating [autism](#)," Supekar said.

More information: *Cell Reports*, Keown et al.: "Local functional overconnectivity in posterior brain regions is associated with symptom severity in autism spectrum disorders."

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