# Single protein targeted as the root biological cause of several childhood psychiatric disorders

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A new research discovery has the potential to revolutionize the biological understanding of some childhood psychiatric disorders. Specifically, scientists have found that when a single protein involved in brain development, called "SRGAP3," is malformed, it causes problems in the brain functioning of mice that cause symptoms that are similar to some mental health and neurological disorders in children. Because this protein has similar functions in humans, it may represent a "missing link" for several disorders that are part of an illness spectrum. In addition, it offers researchers a new target for the development of treatments that can correct the biological cause rather than treat the symptoms. This discovery was published in November 2012 print issue of *The FASEB Journal*.

"Developmental brain disorders such as schizophrenia, hydrocephalus, mental retardation and autism are among the most devastating diseases in children and young adults," said Dusan Bartsch, Ph.D., a researcher involved in the work from the Department of Molecular Biology at the Central Institute of Mental Health at the University of Heidelberg in Mannheim, Germany. "We hope that our findings will contribute to a better understanding, and in the end, to better treatments for these disorders."

Bartsch and colleagues made this discovery using mice with the SRGAP3 protein inactivated. Then they conducted several experiments

comparing these mice to normal mice. The mice with inactive SRGAP3 showed clear changes in their brains' anatomy, which resulted in altered behavior similar to certain symptoms in human neurological and psychiatric diseases. An involvement of SRGAP3 in different brain disorders could indicate that these disorders are possibly connected, as SRGAP3 is a key player in brain development. These different disorders could be connected via the SRGAP3 protein because they all emerge from disturbed development of the nervous system.

"Since Freud put biological psychiatry on the map, we've slowly increased our understanding of how mental health is dictated by chemistry," said Gerald Weissmann, M.D., Editor-in-Chief of *The* FASEB Journal. "Eventually we'll understand the complex biology underlying most psychiatric illnesses, from genes to proteins to cell signaling to overt behaviors. Along the way, as in this report, we're likely to find single targets close to the roots of apparently different mental illnesses."

**More information:** Robert Waltereit, Uwe Leimer, Oliver von Bohlen und Halbach, Jutta Panke, Sabine M. Hölter, Lillian Garrett, Karola Wittig, Miriam Schneider, Camie Schmitt, Julia Calzada-Wack, Frauke Neff, Lore Becker, Cornelia Prehn, Sergej Kutscherjawy, Volker Endris, Claire Bacon, Helmut Fuchs, Valérie Gailus-Durner, Stefan Berger, Kai Schönig, Jerzy Adamski, Thomas Klopstock, Irene Esposito, Wolfgang Wurst, Martin Hrabě de Angelis, Gudrun Rappold, Thomas Wieland, and Dusan Bartsch. Srgap3−/− mice present a neurodevelopmental disorder with schizophrenia-related intermediate phenotypes. FASEB J 26:4418-4428, doi:10.1096/fj.11-202317

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