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## Alterations in the rat brain proteome induced by early maternal separation

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Maternal-infant contacts play an important role in the shaping of newborns' physiological system along with the development and maturation of the brain and behavior. There are some indications that stressful experiences in the early neonatal period may adversely affect the development of brain neurotransmitter systems and contribute to the development of certain mental illnesses. Here, we investigated the effect of early maternal separation on protein expression in selected brain regions and, in parallel we monitored behavior of rat pups and young adults in a light-dark box. Rat pups (Long-Evans) were separated from their mothers on postnatal days 2 to 21 for 3h per day or normally reared. On day 22, some animals were subjected to the light-dark box test and the others were used for the isolation of brain tissue (cortex, hippocampus and cerebellum). Some animals were maintained until 3 months of age and then used for analyses. Brain tissues were homogenized and subjected to label-free quantitative proteomic analysis. Results of proteomic analyses revealed differences in protein profiling of different brain regions and indicated that early maternal separation diversely affected protein expression in the cortex, hippocampus and cerebellum. Changed protein expression was observed also in brain tissues from young adult rats. Animals subjected to maternal separation exhibited anxiety-like behavior, which lasted into young adulthood. In conclusion, these data demonstrate that early life stressful experiences may affect protein expression in some brain regions and lead to behavioral alterations.

### Biography

Jiri Novotny is the Associate Professor of Animal Physiology, Charles University in Prague, has completed his PhD in 1996 at the Czech Academy of Sciences. He has worked as a Postdoctoral Associate in the Institute of Physiology, Czech Academy of Sciences and in 2007 he became a Head of the Department of Physiology, Faculty of Science, Charles University. His research has focused on biochemistry of cell signaling under different physiological and pathophysiological conditions. He has published more than 80 papers in reputed journals and has been serving as an Editorial Board Member of several journals.

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