

Neuronal migration errors: Right cells, wrong place

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Normally, cortical nerve cells or neurons reside in the brain's gray matter with only a few scattered neurons in the white matter, but some people with schizophrenia have a higher number of neurons in the white matter. Neuronal migration errors may arise in schizophrenia as a consequence of both genetic and environmental factors.

The phenomenon of aberrant cellular localization has now been studied in detail in a paper by Yang and colleagues, published in the current issue of [Biological Psychiatry](#).

Using a specialized technique that involves staining cells, the researchers were able to determine the distribution of nerve cells in brain tissue from people who had been diagnosed with [schizophrenia](#) in comparison to tissue from people who did not carry this diagnosis prior to their death.

Their results linked two main findings emerging from analyses of [brain tissue](#) in schizophrenia: abnormalities in the inhibitory neurons within the cortex and increases in neurons in white matter below the cortex.

"Our observations challenge the long held theory that increased neurons in the white matter might be remaining from a transient layer of cells," explained Prof. Cyndi Shannon Weickert and Dr. Samantha Fung. "We suggest that, in schizophrenia, inhibitory neurons that were travelling to the cortex might actually be stuck at some stage in their development."

This study's findings highlight the importance of brain development for

the emergence of symptoms associated with schizophrenia. As noted by Dr. John Krystal, Editor of Biological Psychiatry, "this study highlights the importance for schizophrenia of better understanding the molecular switches that control the migration of nerve cells and the development of the connections between [nerve cells](#)."

If scientists understood the molecular factors that prevented the neurons from migrating into the [cortex](#), they might be able to develop treatments that prevented the inhibitory neurons from getting "stuck" in the white matter.

More information: The article is "Increased Interstitial White Matter Neuron Density in the Dorsolateral Prefrontal Cortex of People with Schizophrenia" by Yang Yang, Samantha J. Fung, Alice Rothwell, Si Tianmei, and Cynthia Shannon Weickert. Yang, Fung, Rothwell, and Shannon Weickert are affiliated with the Schizophrenia Research Institute, Neuroscience Research Australia and the University of New South Wales. Yang and Tianmei are affiliated with Peking University Institute of Mental Health, Beijing, China. The article appears in Biological Psychiatry, Volume 69, Number 1 (January 1, 2011)

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