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SCHIZOPHRENIA:

“Eye Movements and Visual Perception”

Bart Krekelberg, Rutgers University, Newark, NJ

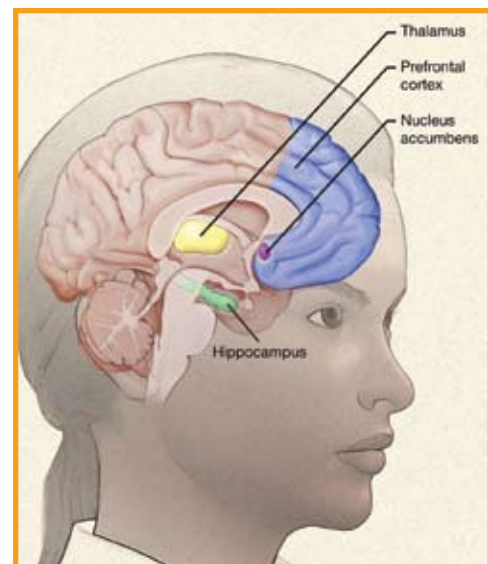
Supported by the National Eye Institute, National Institutes of Health

GRANT DESCRIPTION

With every eye movement that we make, the world sweeps across our retina and appears in a new position. The immediate goal of this project is to answer the fundamental questions about perceptual stability this raises. First, why is the retinal motion caused by eye movements not perceived? Second, how is the ever-changing retinal input transformed into a stable percept of the world? This grant allows for the purchase of a multi-electrode recording setup that will allow for the extension of the experiments to more visual areas, and to investigate the microcircuitry of visual perceptual stability.

SCIENCE AND HEALTH IMPLICATIONS

The brain must monitor its own actions to correctly interpret the signals it receives from the world. This is needed for perceptual stability, but these same mechanisms also play a role in many other neurological processes. The self-monitoring mechanism appears to be damaged in patients with schizophrenia. There are reports, for instance, of patients who state that “if I move, the picture in front of me changes.” Other aspects of schizophrenia may also involve impairments of self-monitoring. For instance, a patient who cannot distinguish self-generated thoughts from real auditory input could hear voices, or experience thought-control. One of the long-term goals of this research is to provide insight into the underlying mechanisms of self-monitoring in a relatively simple sensory system — using those insights to understand diseases in which these mechanisms are impaired, and help with the development of therapies and treatments.



In schizophrenia, deficits in dopamine, a chemical signal in the brain, lead to impairments in the brain regions highlighted above. Additionally, disturbances in other brain areas exacerbate the symptoms of schizophrenia and contribute less recognized non-psychotic symptoms. For example, disturbances in the visual system contribute to such difficulties as interpreting complex visual images, recognizing motion, and reading emotion on others’ faces. Credit: © 2008 Society for Neuroscience, Illustration: Lydia V. Kibiuk, Baltimore, Maryland.

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