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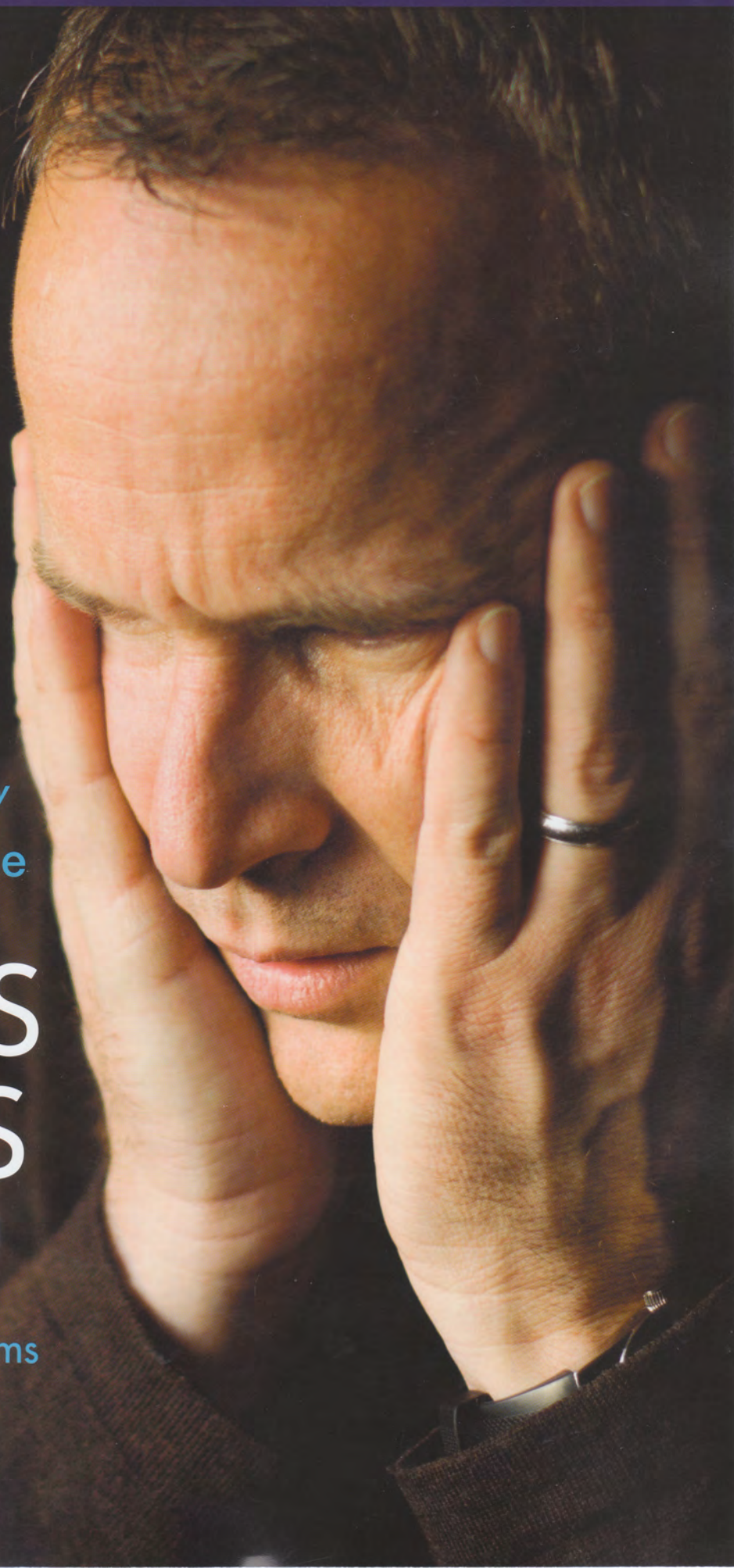
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New study offers hope for schizophrenia-related memory loss treatments

By Jason McBride

A recent groundbreaking University of Pennsylvania study may lead to future treatments for long-term memory problems common with schizophrenia.

Biology professor Ted Abel, PhD, who oversaw the study, is optimistic that new drug treatments for cognitive disorders associated with diseases like schizophrenia can be identified. The study discovered the key steps in the process of turning a short-term memory into a long-term memory.



with so-called episodic memory. This is the part of memory that deals with experiences and chronological events. These are functions of long-term memory. These difficulties can also expose themselves in a patient's inability to store or recall words and are also similar to the problems in both Parkinson's and Alzheimer's patients.

Prior to this study, the exact mechanics of the memory failures in patients with schizophrenia were poorly understood.

Scientists have long believed that memory formation occurs in the part of the brain known as the hippocampus. Abel's team of researchers learned that the process of creating long-term memories involves stimulating certain genes at the molecular level. This is the first time clinical experiments have demonstrated a clear epigenetic link to memory formation.

David Sweatt, chair of the Department of Neurobiology at the University of Alabama at Birmingham, described the study's finding as "one of the most exciting developments in the last couple of decades in the whole memory field."

"It is a paradigm shift, though, from the kind of old style of thinking," he told Public News Radio. "You know, we're kind of used to thinking about genes and environment—you know, nature versus nurture and that old debate."

The genes respond to the stimulus of neurons in the brain. Several studies have shown that proteins created by DNA and RNA in the hippocampus modify neurons as part of the memory process. The key actors in the process of long-term memory are genes known as Nr4a nuclear receptor genes.

During this particular study, researchers blocked the activity of the Nr4a genes in a group of lab mice. The results clearly showed an improvement in the long-term memory of the unaltered mice, while the mice with the blocked genes showed no improvement in their long-term memories. This solidified the proof that the Nr4a genes are crucial to long-term memory formation.

Schizophrenia memory disorder

The typical memory loss problems associated with schizophrenia deal

While numerous drug therapies exist to treat many symptoms and aspects of schizophrenia, there are currently no drug therapies to deal with the memory disorders often associated with the disease.

This study gives the fullest understanding of the mechanics of long-term memory formation at the molecular level, Abel said. A portion of the study already experimented with using a particular class of drug to stimulate the Nr4a genes responsible for the long-term memory formation and activation.

The findings may lead to drug therapies that can be designed to target particular genes. This would mean potentially new treatments not only for those with schizophrenia memory related disorders, but therapies that can be altered to minimize side effects. ★