

## **In the brain, broken down 'motors' cause anxiety**

EurekaAlert!

When motors break down, getting where you want to go becomes a struggle. Problems arise in much the same way for critical brain receptors when the molecular motors they depend on fail to operate. Now, researchers reporting in *Cell Reports*, a Cell Press publication, on February 7, have shown these broken motors induce stress and anxiety in mice. The discovery may point the way to new kinds of drugs to treat anxiety and other disorders.

The study in mice focuses on one motor in particular, known as KIF13A, which, according to the new evidence, is responsible for ferrying serotonin receptors. Without proper transportation, those receptors fail to reach the surface of neurons and, as a result, animals show signs of heightened anxiety.

In addition to their implications for understanding anxiety, the findings also suggest that defective molecular motors may be a more common and underappreciated cause of disease.

"Most proteins are transported in vesicles or as protein complexes by molecular motors," said Nobutaka Hirokawa of the University of Tokyo. "As shown in this study, defective motors could cause many diseases."

Scientists know that serotonin and serotonin receptors are involved in anxiety, aggression, and mood. But not much is known about how those players get around within cells. When Hirokawa's team discovered KIF13A at high levels in the brain, they wondered what it did.

The researchers discovered that mice lacking KIF13A show greater anxiety in both open-field and maze tests and suggest that this anxious behavior may stem from an underlying loss of serotonin receptor transport, which leads to a lower level of expression of those receptors in critical parts of the brain.

"Collectively, our results suggest a role for this molecular motor in anxiety control," the researchers wrote. Hirokawa says the search should now be on for anti-anxiety drug candidates aimed at restoring the brain's serotonin receptor transport service.

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