

Stress gene regulates brain cell power and connections in rodents

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A gene activated by stress adjusts energy output and synapse number of prefrontal cortex neurons, finds a study of male mice and rats published in *JNeurosci*. The results were validated in brain tissue of deceased patients with Alzheimer's disease and depression, two disorders known to be aggravated by stress.

Margarita Arango-Lievano, Freddy Jeanneteau and colleagues found that the gene NR4A1 is involved in regulating mitochondria, the cellular powerhouse, of PFC neurons in response to stress. This may help conserve the cells' energy in the context of immediate stress when demand is high.

However, excessive activity of this gene during [chronic stress](#) may interfere with the normal functioning of circuits between the PFC and the rest of the brain through its impact on connectivity of [individual cells](#).

The researchers show that altering the expression of NR4A1 in animals exposed to chronic stressors protects PFC cells from synaptic loss.

This gene may therefore represent a target to explore in future studies of [stress](#)-related disorders.

More information: The stress-induced transcription factor NR4A1 adjusts mitochondrial function and synapse number in prefrontal cortex, [DOI: 10.1523/JNEUROSCI.2793-17.2018](https://doi.org/10.1523/JNEUROSCI.2793-17.2018)

Provided by Society for Neuroscience

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