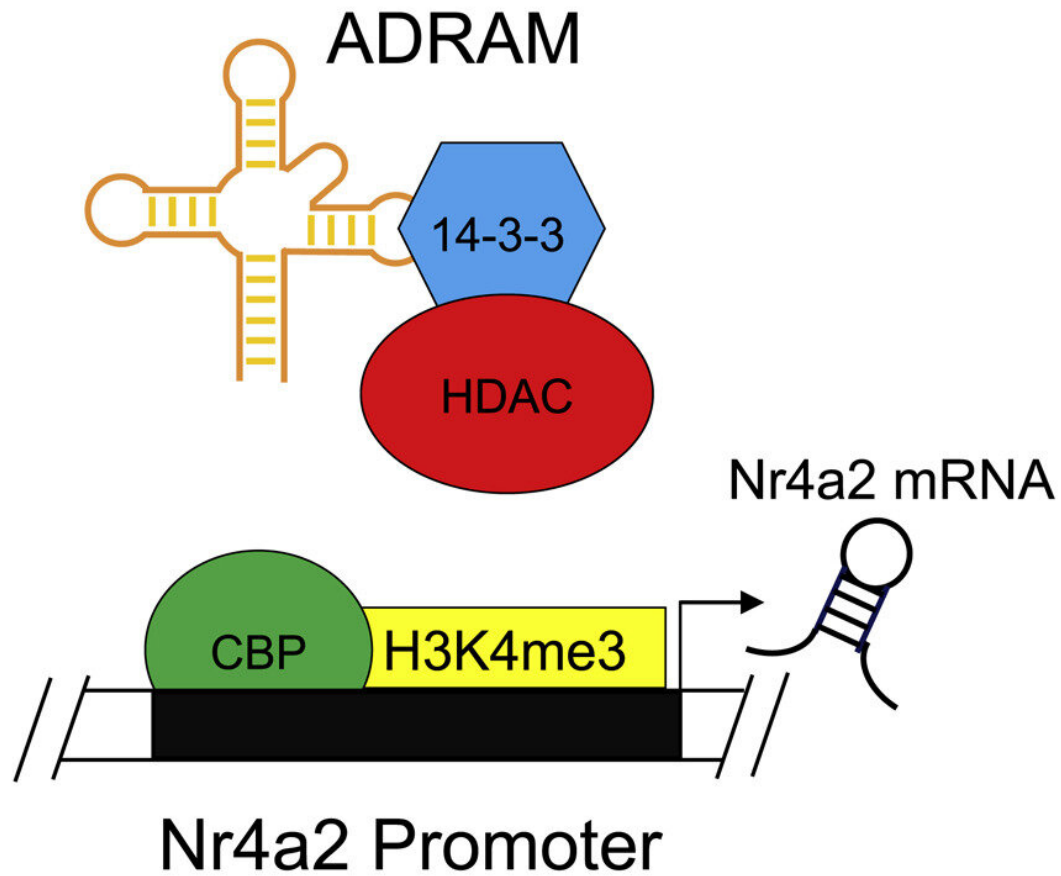
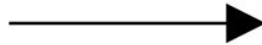


'Junk DNA' could be key to controlling fear

March 22 2022



Extinction
Learning



Extinction
Memory

Graphical abstract. Credit: *Cell Reports* (2022). DOI:

10.1016/j.celrep.2022.110546

A piece of "junk DNA" could be the key to extinguishing fear-related memories for people struggling with post-traumatic stress disorder (PTSD) and phobia, according to a study from The University of Queensland.

An international research project, led by the Queensland Brain Institute's Associate Professor Timothy Bredy, discovered the [new gene](#) while investigating how the genome responds to traumatic experiences.

"Until recently, scientists thought the majority of our genes were made up of junk DNA, which essentially didn't do anything." Dr. Bredy said.

"But when researchers began to explore these regions, they realized that most of the genome is active and transcribed."

Using a powerful new sequencing approach, Dr. Bredy's team identified 433 long non-coding RNAs from relatively unknown regions of the human genome.

"The technology is a really interesting way to zero in on sites within the [genome](#) that would otherwise be masked," Dr. Bredy said.

"It's like harnessing the power of the Hubble Telescope to peer into the unknown of the brain."

A new gene, labeled ADRAM by the researchers, was found to not only act as a scaffold for molecules inside the cell, but also helped coordinate the formation of fear-extinction [memory](#).

Until now, there have been no studies devoted to understanding these genes, or how they might influence [brain function](#) in the context of learning and memory.

"Our findings suggest that long non-coding RNAs provide a bridge, linking dynamic environmental signals with the mechanisms that control the way our brains respond to fear," Dr. Bredy said.

"With this new understanding of gene activity, we can now work towards developing tools to selectively target long non-coding RNAs in the brain that directly modify memory, and hopefully, develop a new therapy for PTSD and [phobia](#)."

This study was published in *Cell Reports*.

More information: Wei Wei et al, ADRAM is an experience-dependent long noncoding RNA that drives fear extinction through a direct interaction with the chaperone protein 14-3-3, *Cell Reports* (2022). [DOI: 10.1016/j.celrep.2022.110546](https://doi.org/10.1016/j.celrep.2022.110546)

Provided by University of Queensland

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