

# A Thirst for Excitement Is Hidden in Your Genes

October 05, 2010

Sensation seeking—the urge to do exciting things—has been linked to dopamine, a chemical that carries messages in your brain. For a new study published in *Psychological Science*, a journal of the Association for Psychological Science, scientists analyzed genes in the dopamine system and found a group of mutations that help predict whether someone is inclined toward sensation seeking.

Sensation seeking has been linked to a range of behavior disorders, such as drug addiction. It isn't all bad, though. "Not everyone who's high on sensation seeking becomes a drug addict. They may become an Army Ranger or an artist. It's all in how you channel it," says Jaime Derringer, a PhD student at the University of Minnesota and the first author of the study. She wanted to use a new technique to find out more about the genetics of sensation seeking. Most obvious connections with genes, like the BRCA gene that increases the risk for breast cancer, have already been found, Derringer says. Now new methods are letting scientists look for more subtle associations between genes and all kinds of traits, including behavior and personality.

Derringer used a kind of mutation in DNA called a single-nucleotide polymorphism, or SNP. A SNP is a change in just one "letter" of the DNA. She started by picking eight genes with various roles related to the neurotransmitter dopamine, which has been linked to sensation seeking in other studies. She looked at a group of 635 people who were part of a study on addiction. For each one, she had genetic information on 273 SNPs known to appear in those 8 genes and a score for how much they were inclined to sensation seeking. Using that data, she was able to narrow down the 273 SNPs to 12 potentially important ones. When she combined these 12 SNPs, they explained just under 4 percent of the difference between people in sensation seeking. This may not seem like a lot, but it's "quite large for a genetic study," Derringer says.

It's too soon to go out and start screening people for these mutations; not enough is known about how genes affect behavior. "One of the things we think is most exciting about this isn't necessarily the story about dopamine and sensation seeking," says Derringer. "It's rather the method that we're using. We used a sample of 635 people, which is extremely small, and we were still able to detect a significant effect. That's actually quite rare in these studies." She said the same method could be used to look at the link between biology and other behaviors—dopamine and cocaine dependence, for example, or serotonin and depression.

Eventually these methods could lead to tests that might help predict whether someone is likely to have problems later, and whether there should be early intervention to guide them down a healthier path.