

Train Your Mind, Change Your DNA

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By Sharon Begley

Yeah, I know that headline echoes yesterday's, but I can't help it: we have now moved beyond studies showing that mental training alters the structure and function of the brain to studies showing that it alters the structure and function of our genes.

Regular readers may have noticed that I'm not a big fan of the "my genes made me do it" school of life, whether "it" is acting in a certain way (as genes "for" shyness or neuroticism supposedly make you do) or developing a particular disease. As I've written, the genes in our cells don't matter one iota if they're not turned on, and there are many things in life that can turn off bad genes such as those that raise the risk of disease such as breast cancer. That's why it seems to me that personal genome scans are just a couple of steps removed from palm reading. As it happens, last year New York started telling 31 private companies that they need licenses to take DNA samples from state residents, and in June California sent cease-and-desist letters to 13 of the companies with the same message.

Reading what genes a person has is so 20th century. Determining which genes are turned on is where the action is. A rat study I've mentioned before, for instance, showed in 2004 that the way a mother rat treats her pups determines whether genes related to neuroticism and fearfulness are on or off. Now comes a study that looks at something similar in people.

The variable wasn't how mom treats you—though I'd bet a nickel that study is just around the corner—but the relaxation response. Back in the 1960s Herbert Benson of Harvard Medical School coined this term to refer to the opposite of the stress response, which floods the body with stress hormones, raises blood pressure, and elevates heart rate. In contrast, the relaxation response is a state of deep rest that decreases metabolism, relaxes muscles, slows heart rate, and lowers blood pressure. Over the years, Benson and colleagues developed a sure-fire way to elicit it.

Now they've figured out how it works to, among other things, treat hypertension (high blood pressure), alleviate pain, even help with infertility and rheumatoid arthritis. As they report in *PLoS One* this evening, the relaxation response alters which genes associated with the body's response to stress are on and which are off. As Benson said in a statement, "We've found how changing the activity of the mind can alter the way basic genetic instructions are implemented."

It's being billed as "the first comprehensive study of how the mind can affect gene expression." By "mind," they mean mental practices such as meditation and prayer, which are among the techniques used by the 19 long-term practitioners of the relaxation response who were studied, along with 19 volunteers who had never engaged in such practices. After the latter went through eight weeks of training, the scientists compared before-and-after patterns of gene expression, finding that mental training alters the expression of genes involved in inflammation, in the form of cell suicide called apoptosis (which can keep damaged cells from forming cancers), and in how the body handles damaging free radicals.

It really is time to stop thinking of our DNA as immutable. Even thinking can change it.