

Yoga and Meditation Can Reverse DNA Activity Which Causes Stress, Illness, Anxiety and Depression



The mind and the body are a power couple, and like all couples that were meant to be together, the direction of influence goes both ways. The mind can influence the body, and the body can influence the mind – and new research has found that together they can change our DNA.

Fascinating [new research](#) has found that by strengthening both the mind and the body through mind-body interventions (MBIs) such as meditation, yoga and Tai Chi, we can influence our physiology at a genetic level. Specifically, we can reverse the molecular reactions in our DNA that cause stress, illness, anxiety and depression.

‘These [mind-body interventions like yoga or meditation] are leaving what we call a molecular signature in our cells, which reverses the effect that stress or anxiety would have on the body by changing how our genes are expressed. Put simply, MBIs cause the brain to steer our DNA processes along a path which improves our wellbeing.’ *Ivana Buric from the Brain, Belief and Behaviour Lab in Coventry University’s Centre for Psychology, Behaviour and Achievement.*

Let’s talk about the research.

The research involved an analysis of over a decade of studies that explored the effect of MBIs such as mindfulness, tai chi, and yoga, on the behaviour of our genes. They also looked at how those changes affected mental and physical health. The researchers specifically looked at the way the genes activated to produce proteins that influence the biology of our body, brain and immune system. Here’s what they found ...

During stress, the sympathetic nervous system is triggered. This is the system that initiates the fight or flight response. When this system switches on, it increases the production of a molecule (NF-kB) which is involved in producing proteins (cytokines) that cause cellular inflammation. Cytokines help recovery and immunity by directing cells towards infection and injury.

It’s the duration of stress, rather than the intensity, that causes problems. When the stress response is short-lived, it’s healthy and helpful. Inflammation is designed to help us heal by boosting our immune system. Often though, the stress we are confronted with is psychological, which is just as real and valid as physical stress, and potentially at least as damaging.

Psychological stress is not a threat to our physical bodies, but it can become one. Under any form of stress, physical or psychological, our bodies continue to produce immune-boosting, inflammatory cytokines, but this inflammation response was only ever meant to switch on briefly and in response to a threat to our physical selves. When the assault from stress is more long-lasting and relentless, as much modern stress is (think work stress, relationship stress, family stress, financial stress), inflammation triggered by the stress response becomes chronic and can cause damage to cells. This is when we become vulnerable to a host of conditions, including physical illnesses such as asthma, arthritis, heart disease, cancer, neurodegenerative diseases, as well as anxiety or depression.

According to the research, MBIs seem to reverse the response to stress by decreasing the production of NF-kB and cellular-inflammation-causing cytokines. This counteracts the effects of stress on the immune system, which reduces the risk of inflammation-related diseases and illnesses.

Okay, so that's the science, but how does it work?

It's clear that MBIs can have a significant physiological effect on our DNA activity, but the exact mechanism remains unclear. One of the ways they might work is by building our capacity to limit stress-inducing mind-wandering.

The human brain is magnificent. It's efficient, powerful, and hardworking, but sometimes it has to deal with an overload of information coming in from the environment. When there is too much to process, the brain uses its attention system to direct its resources. Wherever attention is steered, the brain's resources will follow. Think of attention like an amplifier. It enlarges the target and makes it clearer, so the brain can more effectively apply its resources.

Sometimes, our attention steers us towards things that cause us prolonged psychological stress. Our minds are exquisite wanderers. In fact, [research from Harvard](#) has found that our minds wander about 50% of our waking time. Of course they wander into happy places, but they also wander into the future (where they worry), past (regrets), or to reliving emotional memories that breathe life into negative emotion. All of these are potentially sources of great psychological stress.

The Harvard research also found that 4.6% of a person's happiness was attributable to the activity they were doing, and 10.8% was attributable to their mind-wandering. The researchers found that mind-wandering was generally the cause of unhappiness, not the consequence of it.

'Mind-wandering is an excellent predictor of people's happiness. In fact, how often our minds leave the present and where they tend to go is a better predictor of our happiness than the activities in which we are engaged.' A. Killingsworth, *Harvard*.

Our minds are powerful, for better and worse. MBIs put us in charge of the machine. There is nothing wrong with letting our minds wander – minds love it. There is also nothing wrong with letting our minds wander to places that stir stress or negative emotion, provided that we are able to pull ourselves back from that when we need to. Too often though, our mind-wandering becomes automatic, and without any deliberate intent. This is when the trouble happens.

When our minds switch to auto-pilot and start wandering, it can be easy for them to end up somewhere that amplifies negative thoughts and feelings and breathes fire into stress. Our thoughts become worries and they grow. Our memories become reworked or replayed, and rather than reflecting or learning, we become stuck and overwhelmed. This is when stress can become chronic, and we know what happens then ... the sympathetic nervous system stays on, the production of NF-kB increases, cytokines are produced and 'hello' cellular inflammation.

MBIs have great capacity to boost our mental and physical health, and to cause changes in our DNA that reverse the effects of chronic stress. MBIs can build our capacity to become aware of our thoughts, feelings and sensations, without letting them become a source of distress. They can also strengthen our capacity to reverse from the stress response once it's initiated. However MBIs work, it's clear that mind-body interventions are a powerful way to protect ourselves from the damaging effects of psychological