

Controlling stress responses

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Think finals are stressful? Try being chased by a lion.

Humans evolved in a dangerous, threatening world where [stress](#) usually preceded bodily injury. As a result, the evolutionary theory goes, our [stress response](#) system jump-starts our immune system, triggering the deployment of [white blood cells](#) and increased expression of the inflammatory gene interleukin-6 (IL-6) into the blood stream.

As part of our immune system, IL-6 can help stave off infection and promote wound healing, but if left unregulated, this [inflammatory agent](#)

can contribute to cardiovascular disease, cancer and Alzheimer's. Knowing where and how in the body various forms of IL-6 are produced is an important step in understanding how stress relates to disease.

In a recent study published in *Brain, Behavior and Immunity*, Brandeis researchers discovered that one's perception of stress directly impacts how genes express stress. The paper was written by graduate student Christine McInnis and professor Nicolas Rohleder, and co-authored by Danielle Gianferante, Luke Hanlin, Xuejie Chen and Myriam Thoma.

Researchers have long known that IL-6 proteins increase in blood plasma after stress but this is the first time scientists have observed increased activation of the IL-6 gene in white blood cells as a stress response.

The size and duration of the increase is closely tied to perception and mood, according to the study. The more a person stresses out, the more IL-6 is expressed.

"Stress perception initiates the [gene expression](#) and self-reported mood changes are directly related to the size of the gene expression response," says McInnis.

In other words, we can, to some extent, control our genetic response to stress by moderating how we perceive stress.

"If you learn to control your [stress levels](#), your genes will follow," says McInnis.

So next time you're stressed about a big test, calm down: It might be a bear of a test, but it's no lion.

More information: "Response and habituation of pro- and anti-inflammatory gene expression to repeated acute stress," *Brain, Behavior,*

and Immunity, Available online 12 February 2015, ISSN 0889-1591,
[dx.doi.org/10.1016/j.bbi.2015.02.006](https://doi.org/10.1016/j.bbi.2015.02.006)

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