

Preventing Cancer With Food: Exploring the Epigenetic Switch

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A study published in the *Journal of Nutritional Biochemistry*¹ lends further support to the already compelling evidence that a medicinal ingredient found in broccoli and other cruciferous vegetables (cabbage, cauliflower, Bok choy, Brussels sprouts, turnips) exerts significant anti-cancer effects.

This study showed that sulforaphane (obtained from these vegetables) exerted a key epigenetic effect that greatly inhibited human prostate cancer cells from forming colonies. But many other cancers are linked to the same epigenetic switch, suggesting that sulforaphane may also provide protection against brain, lung, colon, breast, and stomach cancer, as well as chronic lymphocytic leukemia.

To be more specific, studies in recent years have shown that a specific long, non-coding RNA called [LINC01116](#) is very active or as scientists say, up-regulated, in a common form of human prostate cancer. The activity of this long, non-coding RNA has been shown to have direct genetic effects that promote cancer development.

The study in question showed that sulforaphane (from cruciferous vegetables) decreased the expression or normalized the expression of this specific, long, non-coding RNA and in doing so, greatly inhibited prostate cancer cells from forming colonies by a factor of fourfold.

Proteins within the cell (which is what RNA is most famous for), was thought for many years to be part of "junk DNA" – in other words, a bunch of genetic material left over from our ancient ancestors that doesn't do anything, or at least, anything of importance. But we have begun to discover that much of this so-called junk DNA is important epigenetic material that tells the DNA what to do and how to behave – turning on and turning off certain genes and modifying the make-up of others.

The same way computer software enables computer hardware to do or not do certain things, the body's epigenetic activity influences our DNA hardware by turning on and off certain genes, and even altering our gene makeup and function over time, as it senses changes to our environment, nutritional status, exposures to toxins and other factors.¹

Some scientists suggest the rise in conditions such as autism in recent years may be a direct result of our epigenetic material being influenced by our exposure to the build-up of many undesirable environment agents and rapid changes to our food composition, which in turn have altered our DNA gene expression.²⁻³

Studies have shown for a long time that sulforaphane and other constituents found in cruciferous vegetables may also inhibit cancer development in other ways, such as through improved detoxification of cancer-causing agents, inducing cell death of emerging cancer cells (apoptosis), via anti-angiogenesis, protecting against DNA damage, and other effects.⁴ It now appears that sulforaphane may also help prevent certain cancers by also acting on an epigenetic level, which is a breakthrough finding as we await confirmation from follow-up studies.¹

My recommendation for both practitioners and patients remains unchanged: **Eat a cruciferous vegetable serving 3-7 times per week.**

1. Beaver LM, et al. *J Nutr Biochem*, April 207;42:72-83.

2. Tuchman RF. Deconstructing autism spectrum disorders: clinical perspective. *Rev Neurol*, 2013 (Feb 222;56 Suppl 1:S3-12.

3. Frye RE, et al. Cerebral folate receptor autoantibodies in autism spectrum disorder. *Mol Psychiatry*, 2013 Mar;18(3):369-81.