

# Healthy lifestyle turns off genes that cause cancer

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It's no secret that a healthy lifestyle can slow the progression of cancer, but how this happens has been a mystery. Now new evidence suggests an answer: dieting and exercise may turn crucial genes on and off.

In a pilot study involving 30 men with early-stage prostate cancer, Dean Ornish and colleagues at the University of California, San Francisco, US, tested the effects of a dramatic lifestyle change on gene expression in the prostate.

Biopsies taken before and after 3 months of healthy eating, moderate exercise, stress management and psychotherapy showed a significant change in the expression of hundreds of genes.

Many, including several genes involved in tumor formation, were down-regulated, or less active. Others, including some disease-fighting genes, were more active.

A 2005 study (pdf) by Ornish and his team showed how lifestyle changes can reduce certain markers of prostate cancer, possibly slowing its progression. "Now we are starting to understand some of the genetic mechanisms by which these changes may exert such a powerful outcome," says Ornish.

'Wider implications'

Because the researchers tested healthy prostate tissue – the patients had such small tumors they were difficult to biopsy – the results may be significant for cancer prevention.

"The implications may be much more widespread, and not just limited to men for that matter," says Ornish. Two prominent cancer-causing genes called RAN and Shoc2, which were suppressed by the lifestyle changes, are found in most kinds of tumors, including breast and colon cancer.

It is too early to draw conclusions about cause and effect, however, says Meir Stampfer, an epidemiologist at Harvard Medical School.

Long-term follow-up studies are needed to determine if these genetic changes can truly slow or prevent cancer, he says. "But it's a very important first step," he adds. "This will usher in a new wave of research."

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