

Low-Carbohydrate, High-Protein Diets May Reduce Both Tumor Growth Rates and Cancer Risk

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- Laboratory study has clear implications for humans.
- Low carbohydrates reduce blood glucose, which tumor cells need.
- Possible anti-inflammatory effect also observed.

PHILADELPHIA — Eating a low-carbohydrate, high-protein diet may reduce the risk of cancer and slow the growth of tumors already present, according to a study published in *Cancer Research*, a journal of the American Association for Cancer Research.

The study was conducted in mice, but the scientists involved agree that the strong biological findings are definitive enough that an effect in humans can be considered.

“This shows that something as simple as a change in diet can have an impact on cancer risk,” said lead researcher Gerald Krystal, Ph.D., a distinguished scientist at the British Columbia Cancer Research Centre.

Cancer Research editor-in-chief George Prendergast, Ph.D., CEO of the Lankenau Institute for Medical Research, agreed. “Many cancer patients are interested in making changes in areas that they can control, and this study definitely lends credence to the idea that a change in diet can be beneficial,” said Prendergast, who was not involved with the study.

Krystal and his colleagues implanted various strains of mice with human tumor cells or with mouse tumor cells and assigned them to one of two diets. The first diet, a typical Western diet, contained about 55 percent carbohydrate, 23 percent protein and 22 percent fat. The second, which is somewhat like a South Beach diet but higher in protein, contained 15 percent carbohydrate, 58 percent protein and 26 percent fat. They found that the tumor cells grew consistently slower on the second diet.

As well, mice genetically predisposed to breast cancer were put on these two diets and almost half of them on the Western diet developed breast cancer within their first year of life while none on the low-carbohydrate, high-protein diet did. Interestingly, only one on the Western diet reached a normal life span (approximately 2 years), with 70 percent of them dying from cancer while only 30 percent of those on the low-carbohydrate diet developed cancer and more than half

these mice reached or exceeded their normal life span.

Krystal and colleagues also tested the effect of an mTOR inhibitor, which inhibits cell growth, and a COX-2 inhibitor, which reduces inflammation, on tumor development, and found these agents had an additive effect in the mice fed the low-carbohydrate, high-protein diet.

When asked to speculate on the biological mechanism, Krystal said that tumor cells, unlike normal cells, need significantly more glucose to grow and thrive. Restricting carbohydrate intake can significantly limit blood glucose and insulin, a hormone that has been shown in many independent studies to promote tumor growth in both humans and mice.

Furthermore, a low-carbohydrate, high-protein diet has the potential to both boost the ability of the immune system to kill cancer cells and prevent obesity, which leads to chronic inflammation and cancer.

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Media Contact:

Jeremy Moore

(267) 646-0557

Jeremy.Moore@aacr.org [6]

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