Medical Xpress

Gene is linked to colon cancer when folate's low

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(PhysOrg.com) -- Cornell researchers report that they have identified a gene that increases the risk for colon cancer in laboratory mice when their diets lack folate.

Colorectal cancer is the second leading cause of cancer-related deaths in the United States. More than 50,000 people die each year in this country from colon cancer, many due to a lack of early detection.

The new study, published in the March 15 issue of the journal *Cancer Research* (71:6), provides evidence that a combination of folate deficiency and reduced expression of the SHMT1 gene, which is required for accurate DNA synthesis, boosts the risk of colon cancer in a mouse model. The study indicates that the SHMT1 gene may be a factor in itself, and also demonstrates how dietary folate, a B vitamin, may interact with an individual's genetic make-up to increase colon cancer risk. The same researchers implicated this gene as a cause of neural tube defects, a common class of birth defects (see story).

"Nutrition and genetics work together to contribute to the creation of cancer cells, and based on the similarity of folate metabolism in mice and humans; it is likely that this gene is associated with human colon cancer, "said Patrick Stover, professor in the Division of Nutritional Sciences and the senior author of the paper.

In the study, Stover and Cornell colleagues found that the interactions among nutrients and genetic factors play an important role in the

development of numerous cancers, including colorectal cancer.

"Molecular antecedents that promote development of sporadic colon cancer include DNA damage. Lack of critical nutrients (such as folate) increases rates of DNA damage. Therefore, lack of folate has the potential to induce this damage that ultimately results in the progression of colon cancer risk," said Stover.

Screening for colorectal cancer is recommended to all individuals over age 50; however, close to 40 percent of the U.S. population in this age group does not take this precautionary method. Individuals who choose not to pursue colonoscopies may want to ensure that their diets contain adequate amounts of folate, Stover recommended. The U.S. recommended daily allowance for folate is 400 micrograms per day. Foods that are rich in folate include many fruits and vegetables, grains, legumes, nuts and seeds.

Provided by Cornell University

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