Histamine may play role in colorectal tumorigenesis

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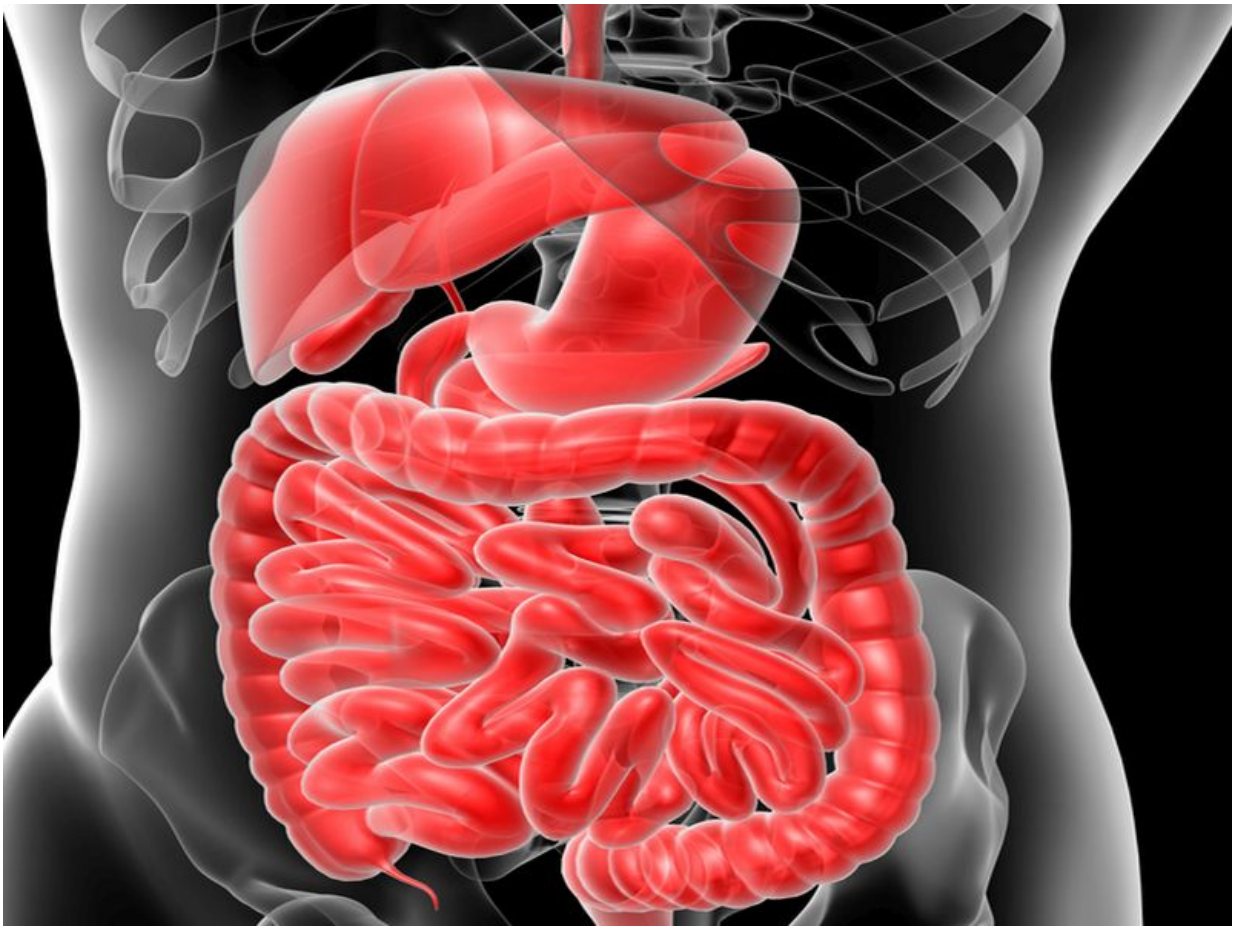

(HealthDay)—Administration of histamine-producing gut microbes to

histidine decarboxylase (HDC)-deficient mice reduces inflammation and tumor formation, suggesting an innovative approach to colorectal cancer (CRC) prevention and treatment, according to an experimental study published online Sept. 13 in *The American Journal of Pathology*.

Noting that HDC deficiency promotes inflammation-associated colorectal cancer, Chunxu Gao, Ph.D., from the Baylor College of Medicine in Houston, and colleagues examined the role of luminal histamine production in colon carcinogenesis.

The researchers found that administration of *hdc*$^{+}$ *Lactobacillus reuteri* in the gut resulted in luminal *hdc* gene expression and production of histamine in the intestines of *Hdc*$^{-/-}$ mice. A decrease in the number and size of colon tumors was seen with this histamine-producing probiotic, as well as a decrease in colonic uptake of [^{18}F]-fluorodeoxyglucose by positron emission tomography in *Hdc*$^{-/-}$ mice. *L. reuteri* administration suppressed keratinocyte chemoattractant, *interleukin (IL)-22*, *IL-6*, *tumor necrosis factor*, and *IL1α* gene expression in the colonic mucosa, and reduced the amounts of proinflammatory keratinocyte chemoattractant, IL-22, and IL-6 in plasma. Relative numbers of splenic CD11b^{+}Gr-1^{+} immature myeloid cells were also decreased by histamine-generating *L. reuteri*. An isogenic HDC-deficient *L. reuteri* mutant, which could not generate histamine, did not suppress carcinogenesis.

"Our results suggest a significant role for histamine in the suppression of chronic intestinal inflammation and colorectal tumorigenesis," James Versalovic, M.D., Ph.D., pathologist-in-chief at Texas Children's Hospital, said in a statement.

One author disclosed ties to BioGaia AB, which partially funded the study.

More information: Abstract

Full Text (subscription or payment may be required)