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Lower levels of antioxidants may lessen damage from colitis

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A new study finds that lowering the levels of an antioxidant in the colon has an unexpectedly positive effect on gastrointestinal (GI) inflammation. The paper is published ahead of print in the *American Journal of Physiology—Gastrointestinal and Liver Physiology*.

Antioxidants are generally considered beneficial substances that help fight cell damage and disease. The human body produces reduced glutathione (GSH), an antioxidant that helps the central and peripheral nervous systems function properly. GSH is also necessary to keep nerve cells (neurons) alive in the enteric nervous system—the network that controls the behavior of the GI tract. Previous research has shown that enteric neurons are able to produce GSH and that having too little GSH promotes cellular damage (oxidative stress) and neuron death.

Researchers from Michigan State University studied the effects of GSH depletion in mice with colon inflammation (colitis) as a model of inflammatory bowel disease. One group of mice was treated with a substance that reduced the level of GSH in the GI tract before inflammation was introduced ("treated colitis"). A second group retained natural levels of GSH prior to inflammation ("untreated colitis").

The treated colitis group had less accumulation of immune cells (neutrophil infiltration) surrounding GI nerve cells when compared with the untreated colitis group. Neutrophil infiltration is a response to inflammation; therefore, less infiltration may be associated with reduced inflammatory damage. The treated mice also did not experience colitis-

associated weight loss, which suggests that reduced GSH levels—surprisingly—protects the colon from severe inflammatory-induced damage in this model. "These observations present a potential therapeutic target for improved GI pathology during inflammation," the authors wrote.

More information: Isola AM Brown et al. The antioxidant glutathione protects against enteric neuron death in situ, but its depletion is protective during colitis, *American Journal of Physiology - Gastrointestinal and Liver Physiology* (2017). DOI: 10.1152/ajpgi.00165.2017

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