

Caffeic acid inhibits colitis in a mouse model -- is a drug-metabolizing gene crucial?

May 26 2009

Researchers at Iowa State University have found that increased expression of a form of cytochrome P-450 (CYP4B1) is a key marker of inhibition of colitis in mice by caffeic acid, an anti-inflammatory antioxidant compound widely distributed in foods.

The results, which appear in the June 2009 issue of [Experimental Biology and Medicine](#), implicate CYP4B1, a form of cytochrome P450 previously found to be associated with resolution of allergic inflammation in another model.

The normalization of CYP4B1 by caffeic acid treatment was associated with significant lessening of colitic damage, assessed by examining colon histopathology. In comparison with rutin, an anti-inflammatory flavonoid and hypoxoside extract, a botanical known as African potato previously shown to protect against colitis, all three compounds had anti-inflammatory effects, suppressing myeloperoxidase, IL-17 and iNOS and increasing IL-4, known factors associated with inflammation responses. But only caffeic acid protected against the dextran sulfate sodium induced colitis.

Its novel mechanism related to CYP4B1 is being studied further. The research team, Zhong Ye, a graduate student in Toxicology, along with Microbiology graduate students Zhiping Liu and Abigail Henderson, Visiting Scientist Kwangwon Lee, Korea University, Dr. Michael Wannemuehler, Veterinary Microbiology, Dr. Jesse Hostetter, a veterinary pathologist, and Dr. Suzanne Hendrich, Toxicologist and

Nutritionist, performed studies in 8 week old mice fed the various dietary components and then exposed to dextran sulfate sodium in a mildly irritating dose to induce colitis.

Dr. Hendrich noted that "this study of caffeic acid will help us to advance studies of botanicals and plant foods with respect to their ability and mechanisms of inhibiting colitis, and perhaps [colon cancer](#), because colitis increases risk for this disease".

In summary, normalization of expression of CYP4B1, a drug metabolizing enzyme possibly related to reversal of inflammatory damage was a hallmark of the efficacy of caffeic acid, a component found widely in plant foods in the human diet, to inhibit intestinal tissue damage in a mouse model commonly used to simulate colitis. Dr. Steven R. Goodman, Editor-in-Chief of *Experimental Biology and Medicine* said "The article by Hendrich and colleagues may help in the future design of more effective treatments to prevent or diminish colitis".

Source: Society for Experimental Biology and Medicine ([news](#) : [web](#))

Citation: Caffeic acid inhibits colitis in a mouse model -- is a drug-metabolizing gene crucial? (2009, May 26) retrieved 19 April 2024 from <https://medicalxpress.com/news/2009-05-caffeic-acid-inhibits-colitis-mouse.html>

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