

# Fox Chase researchers report that naproxen reduces tumors in a mouse model of colon cancer

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Numerous studies show that non-steroidal anti-inflammatory drugs (NSAIDs) reduce the risk of colon cancer. However, animal studies testing the NSAID naproxen or its derivative, NO-naproxen, have focused primarily on chemically-induced tumor formation. Now, researchers at Fox Chase Cancer Center find that naproxen and NO-naproxen reduce tumor formation in a strain of mutant mice that spontaneously develop colon tumors. The data also suggest that naproxen blocks a gatekeeper step that initiates tumor formation.

Margie Clapper, PhD, Co-Leader of the Cancer Prevention and Control Program at Fox Chase, will present the data in a late-breaking abstract session at the AACR 102nd Annual Meeting 2011 on Wednesday, April 6.

"There is a major effect on the very small lesions, about a 90% reduction in the [mutant mice](#) treated with [naproxen](#) compared with control animals," says Clapper. "That tells us this drug may be very appropriate for intervening early in people, far in advance of the development of large tumors. We might be able to have a significant impact on the very early and small lesions, thus reducing the morbidity associated with the disease."

Scientists have shown previously that both naproxen and NO-naproxen kill colon cancer cells in culture, with NO-naproxen appearing to be

more powerful than naproxen. In the current study, the team fed mice genetically predisposed to spontaneously develop colon tumors either regular food or food supplemented with high- or low-dose naproxen or high- or low-dose NO-naproxen. After 45 days, they found that mice fed low-dose naproxen had 70.3% fewer small tumors than the control animals and mice fed low-dose NO-naproxen had 64.0% fewer tumors than control animals. Moreover, a 89.3% reduction in very small tumors, known as microadenomas, was observed when mice were fed high-dose naproxen.

Although Clapper and first author Wen-Chi Chang, PhD, Assistant Research Professor at Fox Chase, had expected that NO-naproxen would be a more powerful chemopreventive agent based on cell culture data, the current study indicates this is not the case in animals.

Clapper says their results, which favor naproxen, fit well with a recent decision by the U.S. Food and Drug Administration (FDA). Scientists had developed NO-naproxen with the goal of reducing gastrointestinal toxicity associated with regular use of NSAIDs. The FDA, however, declined to approve NO-naproxen saying there was not enough evidence that it was less toxic than the older drug. "Our data are highly supportive of using what is already on the market, and FDA approved for arthritis, for the prevention of cancer," Clapper says.

Chang says a key aspect of the new data is naproxen's ability to block a very early step in [colon cancer](#) formation. "If we can identify the exact mechanism that naproxen uses to block [tumor formation](#), then, in the future, we can work with chemists to design a compound that hits that pathway, without the broad spectrum of effects – and side effects – seen with NSAIDs," Chang says.

Provided by Fox Chase Cancer Center

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