

Nanoparticle-based combination therapy shows promise in colon cancer prevention

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(PhysOrg.com) -- Using nanoparticles to deliver a cocktail of aspirin and folic acid, researchers at the Western University of Health Sciences (WUHS) have created what could be an effective agent to prevent colon cancer. The nanoparticle formulation, which was simple to prepare, reduced the formation of aberrant crypt foci - an important precursor of colon cancer - by as much as 75 percent in a animal model of colon cancer.

Sunil Prabhu led the research team that developed this polymeric nanoparticle chemoprevention agent. He and his collaborators reported their findings in the journal [Cancer Prevention Research](#).

A growing body of evidence suggests that aspirin, the vitamin folic acid, and [calcium supplements](#) each act to prevent the development of the [precancerous polyps](#) that become [colon tumors](#). Prabhu and his research team had recently shown that a cocktail of these three agents significantly reduced the viability of human [colon cancer cells](#) lines.

Taking these finding one step further, the WUHS team created a biodegradable polymeric nanoparticle that encapsulates aspirin and folic acid in a simple process. The researchers then coated the nanoparticles with a thin layer of an FDA-approved polymer that drug manufacturers use to make pills that only dissolve in the colon.

Using a well-established animal model of colon cancer, the researchers tested a variety of different dose combinations of the three compounds, both encapsulated in a nanoparticle or given as a combined supplement without nanoparticle encapsulation. Nanoparticle-encapsulated aspirin and folic acid were co-administered with a standard calcium supplement. These experiments showed that both the unmodified and encapsulated treatments, given in a variety of different dosing regimens, were effective at preventing the

formation of aberrant crypt foci. However, the nanoparticle-calcium combination containing the lowest doses of aspirin and folic acid were more effective than the regimens using the highest doses of the unencapsulated compounds. One interesting finding was that when folic acid and aspirin were encapsulated separately in different nanoparticles and then administered together with calcium, there seemed to be protective effect.

This work, which was supported by the National Cancer Institute, is detailed in a paper titled, "Chemoprevention of [Colon Cancer](#) in a Rat Carcinogenesis Model Using a Novel Nanotechnology-Based Combined Treatment System."

More information: [View abstract](#)

Provided by National Cancer Institute

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