Study reveals capsaicin can act as cocarcinogen

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The September cover story of the nation's leading cancer journal, *Cancer Research*, features a new study from The Hormel Institute, University of Minnesota, that links capsaicin, a component of chili peppers, to skin cancer. While the molecular mechanisms of the cancer-promoting effects of capsaicin are not clear and remain controversial, The Hormel Institute has shown a definite connection to formation of skin cancer through various laboratory studies.

Ann Bode, professor in the institute's Cellular and Molecular Biology Research Section, led the research team on this study along with colleagues Mun Kyung Hwang and Zigang Dong.

Capsaicin, widely consumed worldwide in foods that contain chili peppers, is also used in topical creams for pain relief and its role in cancer development is controversial. Capsaicin has been shown to induce apoptosis (cell death) in cancer cells. However, research findings have also shown that it can also act as a carcinogen, especially at the tumor promotion stage.

Bode says the possibility that capsaicin induces inflammation and may affect cancer development is a critical result of the study. "Most notably, the results raise concerns that a natural compound found in hot peppers used in over-the-counter topical pain remedies might increase skin cancer risk," Bode says.

The study's key findings include:

- The co-carcinogenic effect of capsaicin appears to be mediated through the epidermal growth factor receptor (EGFR) and not the transient receptor potential vanilloid subfamily member 1 (TRPV1), a known pain receptor.

- Topical application of capsaicin on the dorsal skin of wildtype or TRPV1 knockout mice induced tumors in both types but more and larger skin tumors in the knockout mice.

- A known inflammatory enzyme, cyclooxygenase-2 (COX-2) was highly elevated following treatment with capsaicin.

Provided by University of Minnesota