

# Peptide derived from cow's milk kills human stomach cancer cells in culture

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New research from a team of researchers in Taiwan indicates that a peptide fragment derived from cow's milk, known as lactoferricin B25 (LFcinB25), exhibited potent anticancer capability against human stomach cancer cell cultures. The findings, published in the *Journal of Dairy Science*, provide support for future use of LFcinB25 as a potential therapeutic agent for gastric cancer.

"Gastric cancer is one of the most common causes of cancer-related mortality worldwide, especially in Asian countries," says Wei-Jung Chen, PhD, of the Department of Biotechnology and Animal Science of National Ilan University, Taiwan Republic of China. "In general, the main curative therapies for [gastric cancer](#) are surgery and chemotherapy, which are generally only successful if the cancer is diagnosed at an early stage. Novel treatment strategies to improve prognosis are urgently needed."

Investigators evaluated the effects of three peptide fragments derived from lactoferricin B, a peptide in milk that has antimicrobial properties. Only one of the fragments, LFcinB25 reduced the survival of human AGS (Gastric Adenocarcinoma) [cells](#) in a dose-dependent and time-dependent manner.

Under a microscope the investigators could see that after an hour of exposure to the gastric [cancer cells](#), LFcinB25 migrated to the cell membrane of the AGS cells, and within 24 hours the cancer cells had shrunken in size and lost their ability to adhere to surfaces. In the early

stages of exposure, LFcInB25 reduced cell viability through both apoptosis (programmed cell death) and autophagy (degradation and recycling of obsolete or damaged cell parts). At later stages, apoptosis appeared to dominate, possibly through caspase-dependent mechanisms, and autophagy waned.

"This is the first report describing interplay between apoptosis and autophagy in LFcInB-induced cell death of cancer cells," says Dr. Chen.

The research also suggested a target, Beclin-1, which may enhance LFcInB25's cytotoxic action. Beclin-1 is a protein in humans that plays a central role in autophagy, tumor growth, and degeneration of neurons. In this study, the investigators found that cleaved beclin-1 increased in a time-dependent manner after LFcInB25-exposure, suggesting to the authors a new approach in drug development that may boost the anticancer effects of LFcInB25.

"Optimization of LFcInB using various strategies to enhance further selectivity is expected to yield novel anticancer drugs with chemotherapeutic potential for the treatment of gastric cancer," concludes Dr. Chen.

**More information:** "Bovine lactoferricin B induces apoptosis of human gastric cancer cell line AGS by inhibition of autophagy at a late stage," by W.-R. Pan, P.-W. Chen, Y.-L. S. Chen, H.-C. Hsu, C.-C. Lin, and W.-J. Chen. *Journal of Dairy Science*, Volume 96, Issue 12 (December 2013), [dx.doi.org/10.3168/jds.2013-7285](https://doi.org/10.3168/jds.2013-7285)

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