



Anti-Tumor Effect of Nutrient Synergy: A Novel MMP Inhibitor in Pancreatic Cancer Cell Line MIA PaCa-2 (2003)

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Abstract

Introduction:

Matrix metalloproteinases (MMPs) have received much attention in recent years for their role in various malignancies, and have been implicated in tumor invasion, metastasis and angiogenesis. We have recently shown in vitro that Nutrient Synergy (NS), a novel formulation consisting of lysine, proline, arginine, ascorbic acid, and EGCG, inhibits MMP expression in cells, invasion, and metastasis in a number of cancers, including breast, prostate, colon, and melanoma. NS also suppressed the growth of these tumors, without any adverse effects, in nude mice. In the current study, we investigated the effect of NS in pancreatic cancer. Cancer of pancreas continues to be a major unsolved health problem, causing approximately 28,000 deaths in US and 50,000 deaths in Europe each year. Pancreatic cancer is the fourth leading cause of cancer-related deaths in both men and women.

Objective:

We investigated the effect of NS on pancreatic cancer cell line MIA PaCa-2 for viability, MMP expression, invasion, and morphology.

Methods:

Viability or cytotoxicity was evaluated based on cell proliferation by MTT assay and MMP expression in condition media by gelatinase zymography. Invasion through Matrigel was assayed and morphology was observed by Hematoxylin and Eosin staining.

Results:

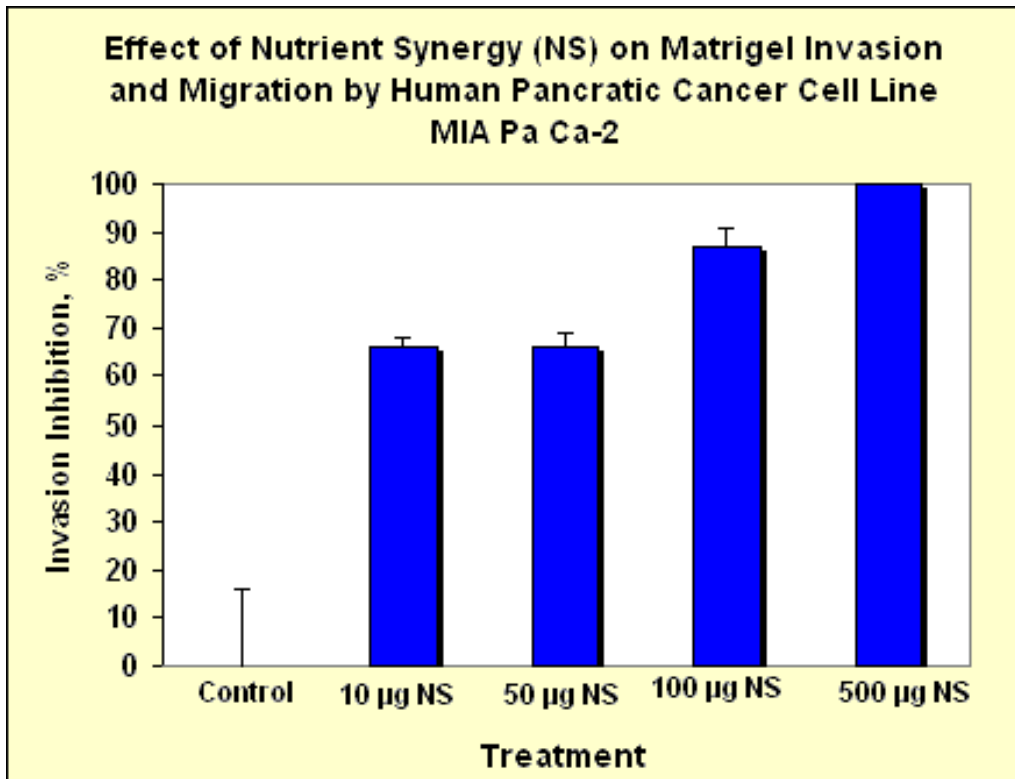
1. NS was not cytotoxic at 10 µg/ml and exhibited dose response toxicity with maximum toxicity of 38% over the control at 1000 µg/ml.
2. Zymography demonstrated production of only MMP-9, which showed a dose-dependent decreased expression, which was abolished at 100 µg/ml of NS.
3. Invasion through Matrigel was inhibited at 10, 50, 100, and 500 µg/ml by 66, 66, 87 and 100% respectively. H&E staining did not indicate changes even at highest concentration of NS.

Conclusions:

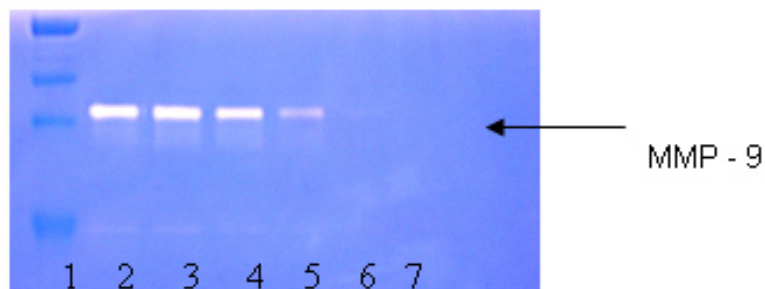
Our results suggest that NS is an excellent candidate for therapeutic use in the treatment of pancreatic cancer, by inhibiting MMP expression, invasion, and angiogenesis - all important promising parameters for cancer prevention.

Comment:

Cancer of the pancreas is a highly lethal disease with the poorest likelihood of survival among all major malignancies; metastasis is associated with more than 80% of the cases. This study demonstrated significant inhibition of the metastatic parameters of MMP expression, invasion, and angiogenesis, suggesting NS is an excellent candidate for therapeutic use in the treatment of pancreatic cancer.



Effect of Nutrient Synergy (NS) on MMP-9 Expression by Pancreatic Cancer Cells



1-Markers, 2-Control, 3-7 NS 10, 50, 100, 500, 1000 µg/ml

