



A Novel Nutrient Synergy Approach to Inhibit Cancer Development

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Cancer Overview

Cancer is the most feared disease affecting mankind and is the second leading cause of death in the world

Each year about 1.4 million new cases of cancer are diagnosed. Despite \$25 billion spent on cancer research over the last 20 years, death rates from cancer have increased and a cure is not in sight

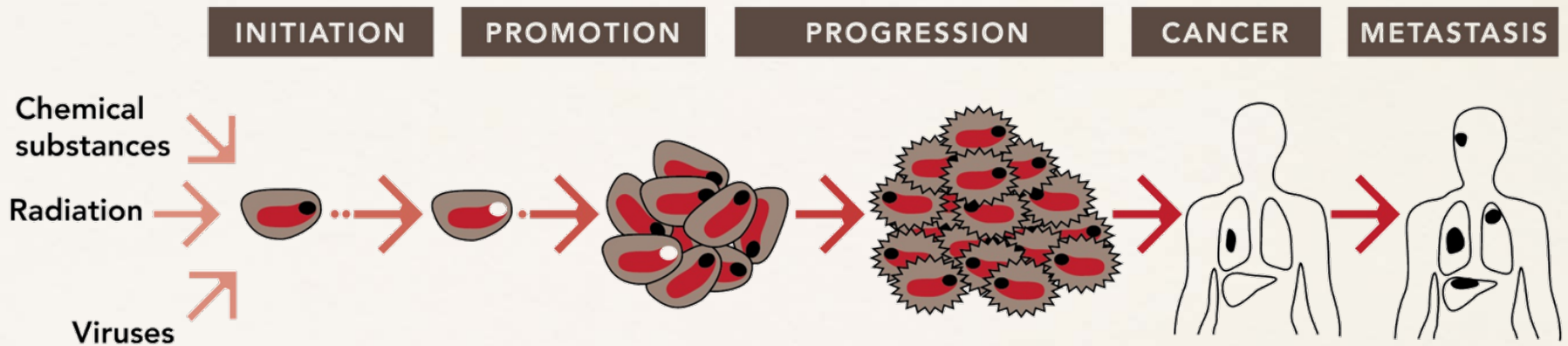


Hallmarks of Cancer

- Cell and tumor growth
- Invasion in the tissue
- Metastasis to other organs
- Angiogenesis
(new blood vessel formation)
- Apoptosis (cell death)



Origin of Cancer



Standard Treatments and Their Side Effects

- Chemotherapy
- Radiation
- Surgery

Side
Effects



- Infection
- Severe Anemia
- New Cancer Cells
- Bleeding
- Liver and Kidney Damage
- Death



Cellular Medicine: Nutrient Synergy

The Micronutrient Synergy components include:

- Vitamin C
- Lysine and Proline
- Green tea extract
- Other amino acids and trace elements.

The natural components of Nutrient Synergy were tested in vitro (isolated cells) and in vivo (in animals) to address different aspects of cancer development.



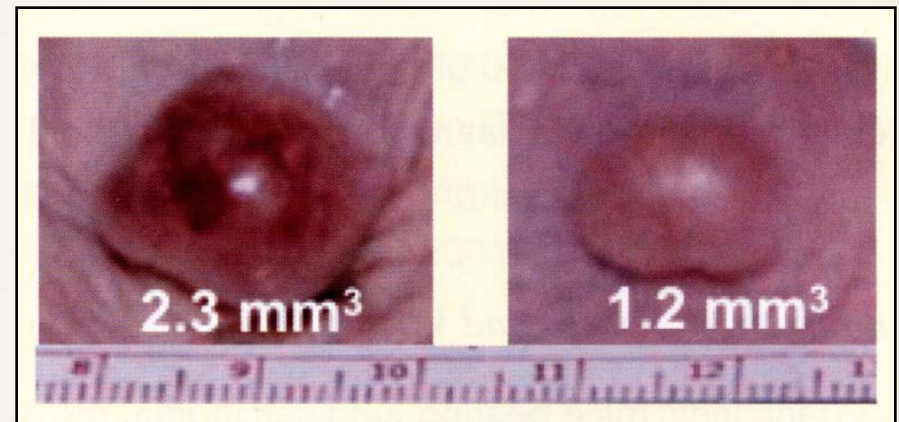
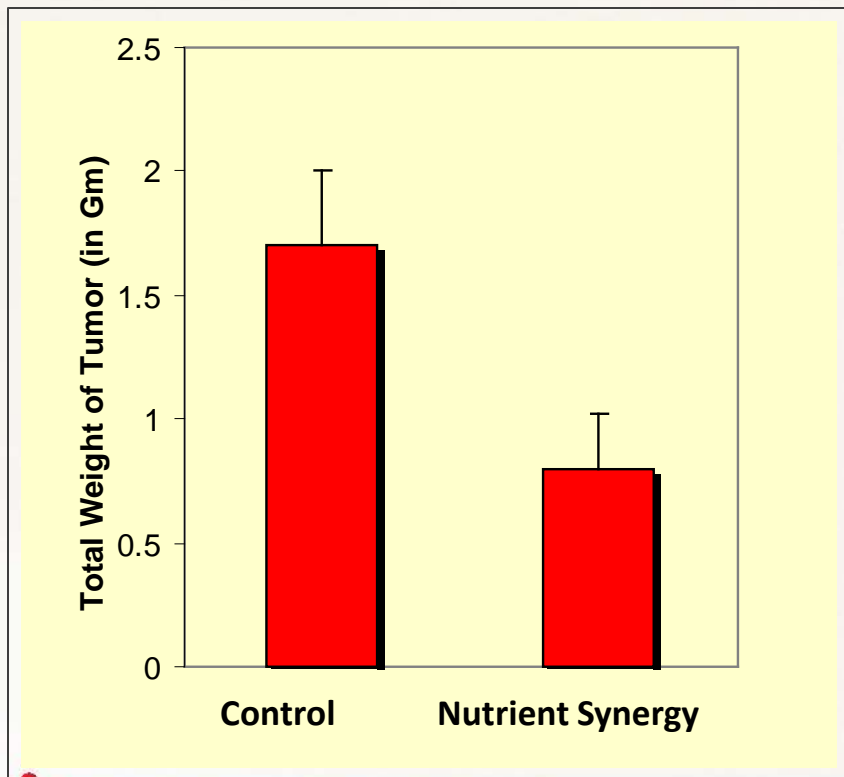
Anti-Cancer Efficacy Of Micronutrients

- Inhibition of tumor growth/proliferation
- Inhibition of invasion
- Inhibition of metastasis
- Inhibition of angiogenesis
- Induction of apoptosis



Nutrient Synergy Inhibits Growth of Osteosarcoma Tumors

Tumors growth and their weight was significantly lower in mice fed micronutrient supplemented diet compared to controls



Control

Nutrient Synergy



Nutrient Synergy Inhibits Tumor Growth: Other Xenograft Studies

Cancer cells Reduction of tumor weight by NM

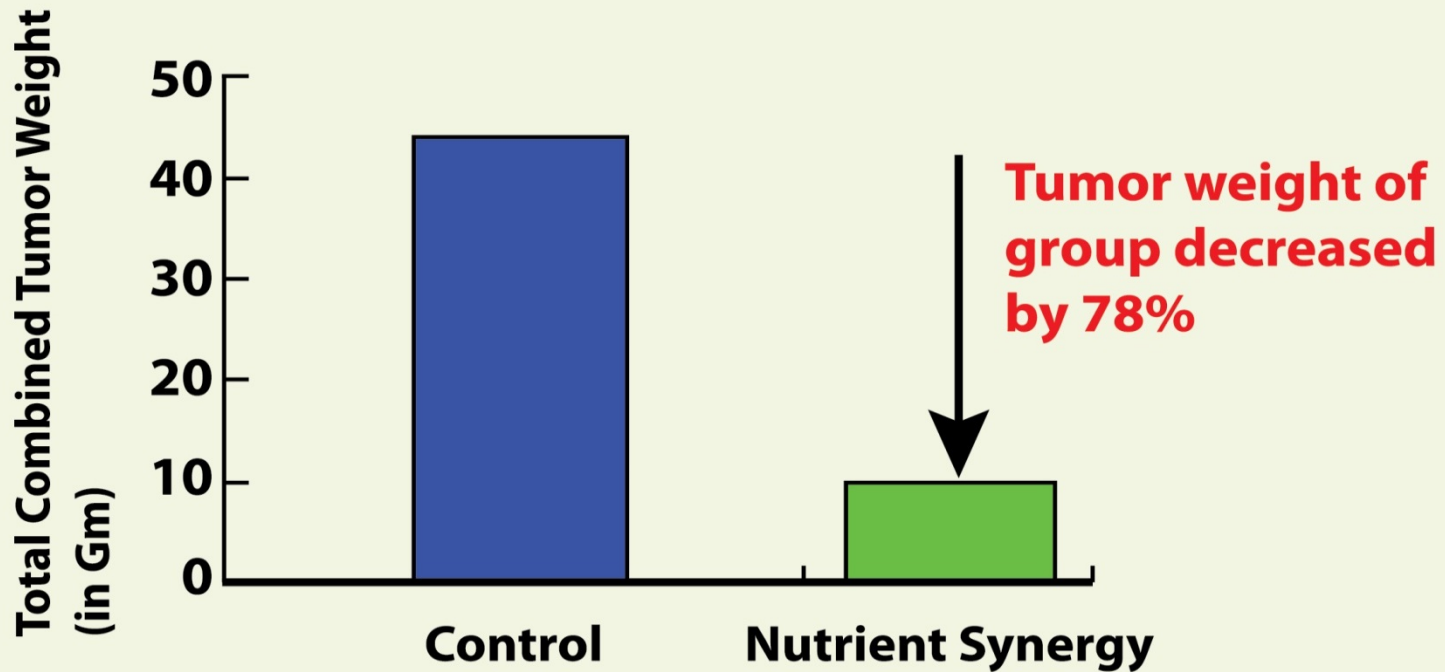
Colon HCT-116	63%
Cervical HeLa	59%
Melanoma A2058	57%
Prostate PC-3	47%
Osteosarcoma MMNG	53%
Lung A-549	44%

Xenograft studies showed that nude mice fed a diet supplemented with 0.5% NS had reduced tumor growth compared to those fed a Control diet.



Nutrient Synergy Inhibits Growth of Chemically Induced Breast Tumors

Breast tumors were induced in female rats by N-methyl-nitrosourea (NMU).

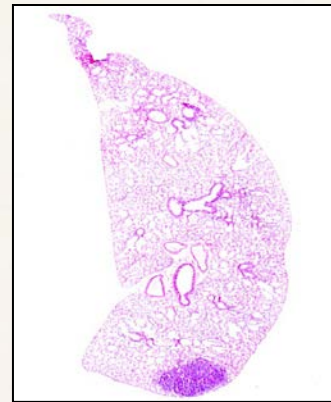
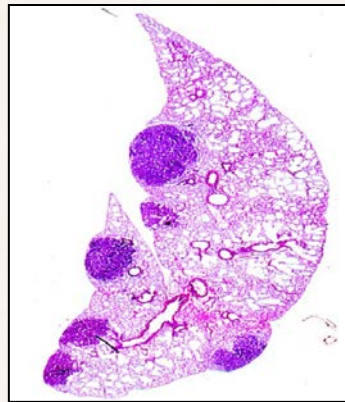


Nutrient Synergy Inhibits Growth of Chemically Induced Lung and Skin Tumors

Control

Nutrient Synergy

Lung Tumor
(Urethane)



Skin Tumor
(DMBA)



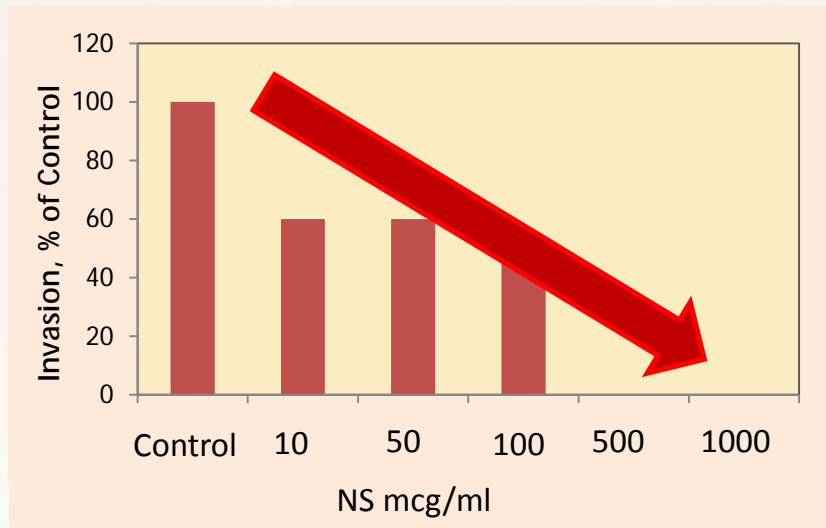
Nutrient Synergy inhibits growth of chemically-induced tumors



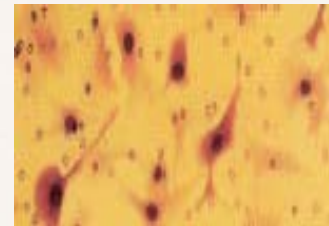
Nutrient Synergy Inhibits Cancer Cell Invasion

Invasion refers to the penetration of cancer cells into neighboring tissue with the help of collagen destroying enzymes.

In the presence of micronutrients the invasion of fibrosarcoma HT-1080 cells through Matrigel was inhibited in a dose-dependent manner.



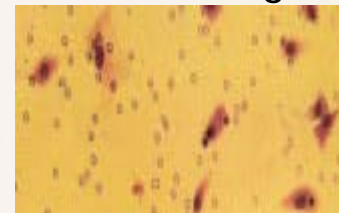
Control



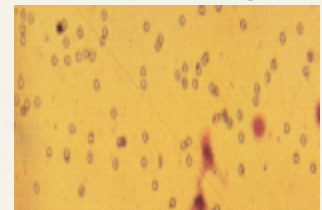
NS 10 mcg/ml



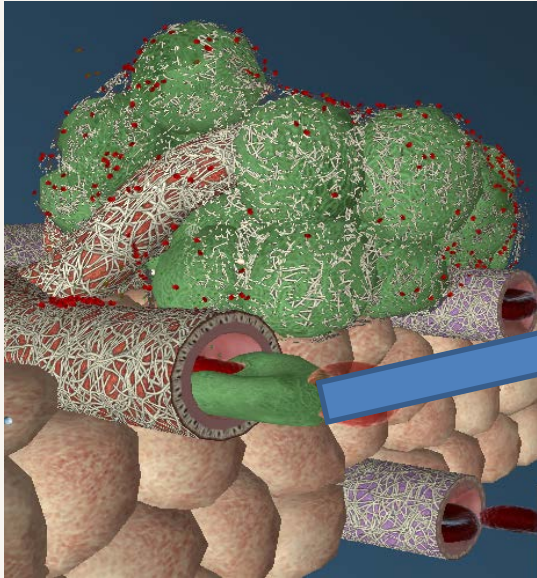
NS 100 mcg/ml



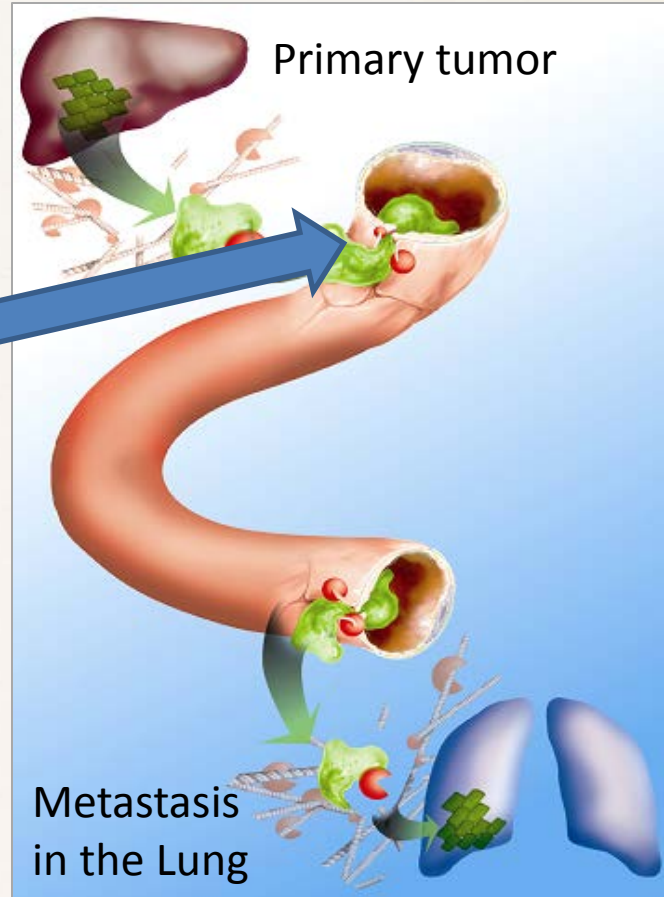
NS 500 mcg/ml



Metastasis



Cancer cell detaches from a tumor mass and enters blood circulation.

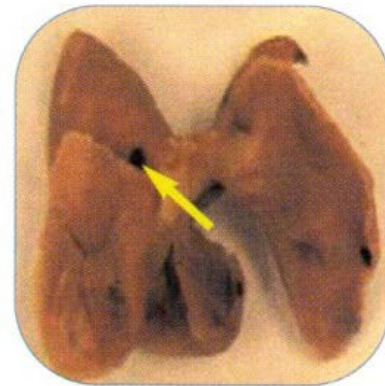


Nutrient Synergy Inhibits Metastasis

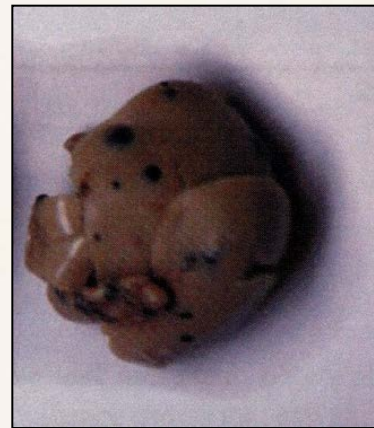
Control

Nutrient Synergy

Lung



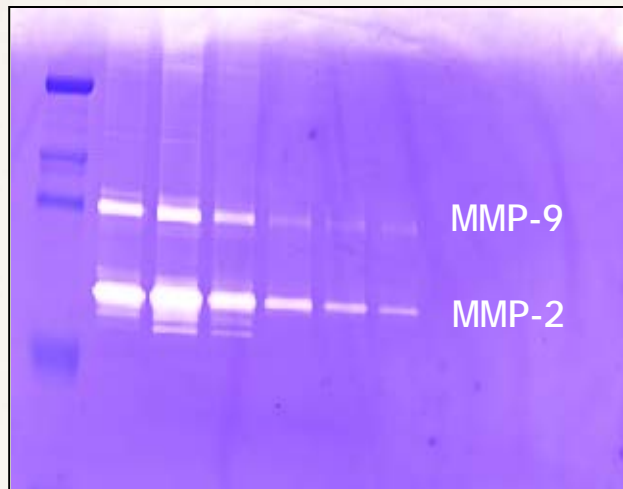
Liver



Nutrient Synergy reduced melanoma metastasis to the lungs and liver



NS Inhibits Secretion of MMPs in Vitro



Secretion of both MMP-9 and MMP-2 by the Fibrosarcoma cells (HT-1080) was inhibited by NS in dose dependent fashion.
(Zymography assay)

The NS inhibited MMP-2 secretion in:

- Ovarian cancer
- Cervical cancer
- Synovial sarcoma

The NS inhibited MMP-9 secretion in:

- Pancreatic cancer

The NS inhibited MMP-2 and -9 secretion

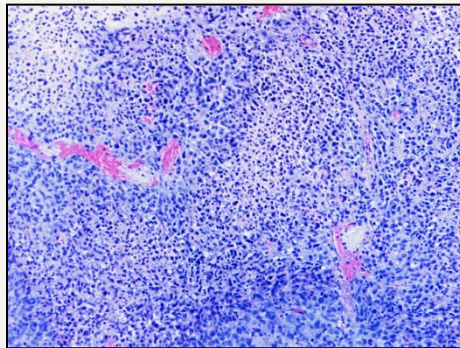
- Fibrosarcoma
- Melanoma



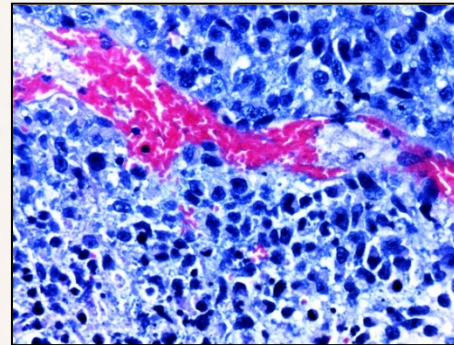
New Blood Vessel Formation (Angiogenesis) Reduced with Nutrient Synergy

Nutrient Synergy reduced blood vessel formation in osteosarcoma tumors

Control
group



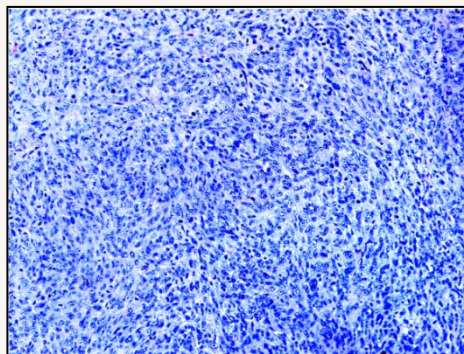
Magnification 200x



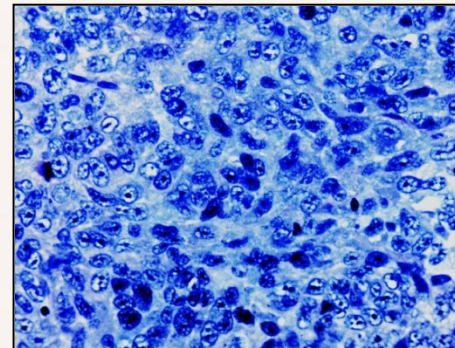
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Highly
vascular

Micronutrient
Supplemented
Group



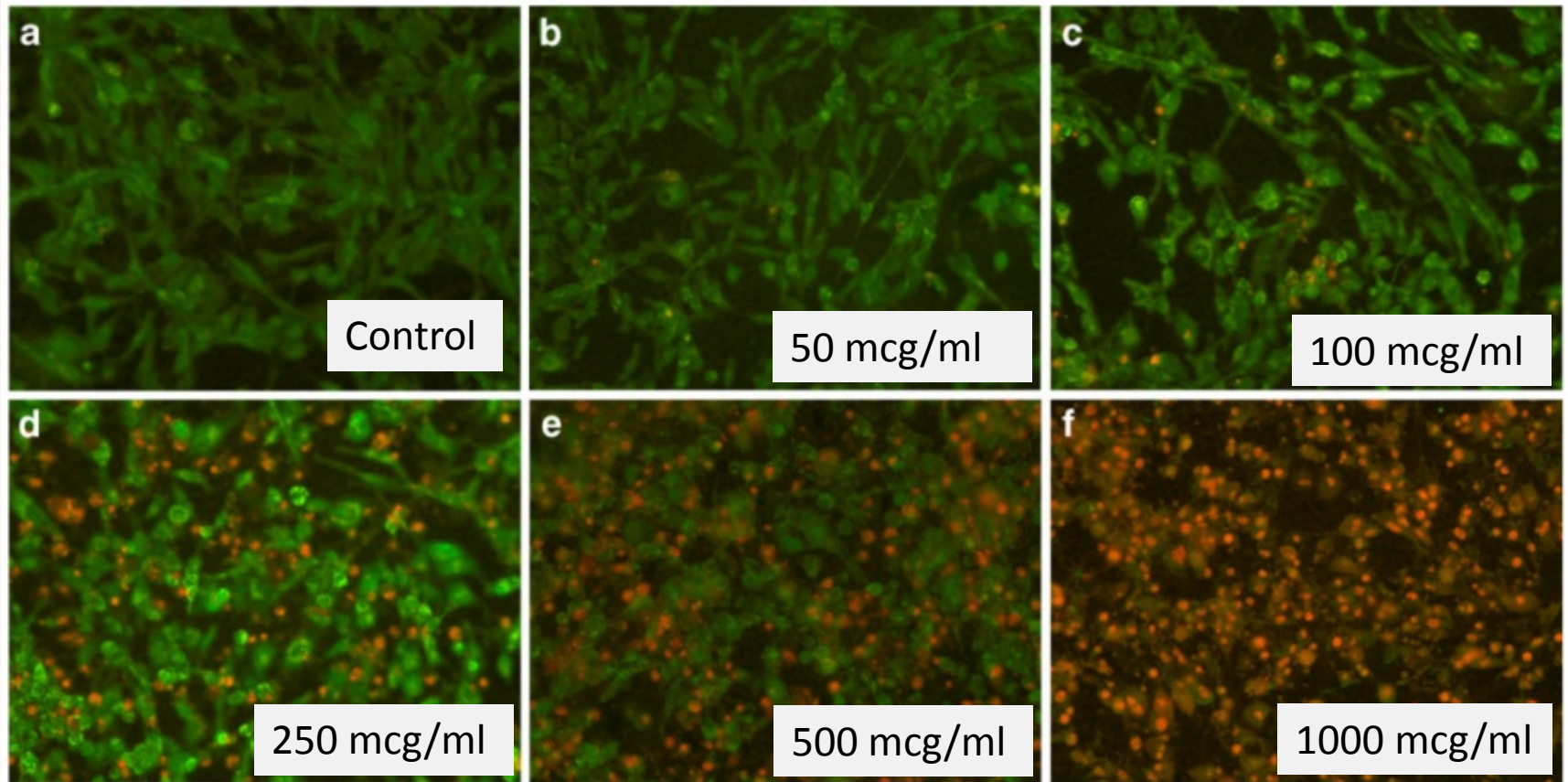
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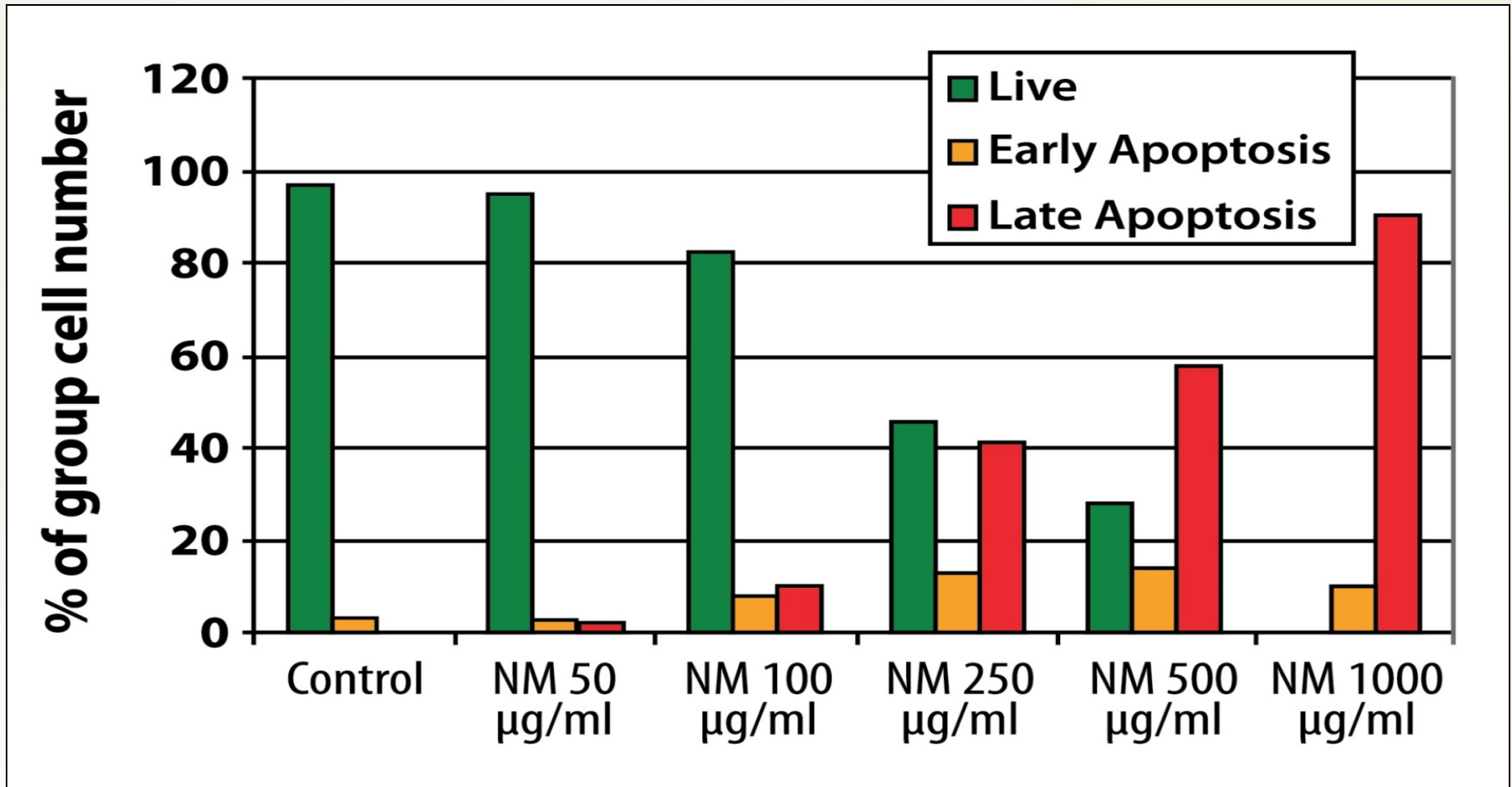
Micronutrient Synergy Promotes Cancer Cell Death (Apoptosis)



Nutrient Synergy enhanced rhabdomyosarcoma cell death



Increased Cancer Cell Apoptosis with Nutrient Synergy



Conclusion

Our results suggest that Nutrient Synergy is highly effective in inhibiting all important mechanisms in cancer development and offers unique benefits in fighting cancer world-wide.



THANK YOU



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