

NATURAL ZEOLITE

(Ca-Clinoptilolite Tuff)

Medicinal, Pharmaceutical & Veterinary Applications:

**Antioxidant, Anticancer, Wound Treatment, Antiacid
Antibacterial, Antifungal**

(Compiled by Michael Leu)

Reference 1

J Mol Med (2001) 78: 708-720, © Springer-Verlag 2001

Natural zeolite clinoptilolite: new adjuvant in anticancer therapy

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- Natural silicate materials, including zeolite clinoptilolite, have been shown to exhibit diverse biological activities and have been used successfully as a vaccine adjuvant and for the treatment of diarrhoea.
- Report a novel use of finely ground clinoptilolite as a potential adjuvant in anticancer therapy.
- Clinoptilolite treatment of mice and dogs suffering from a variety of tumor types led to improvement in the overall health status, prolongation of life span, and decrease in tumors size.
- Local application of clinoptilolite to skin cancers of dogs effectively reduced tumor formation and growth.
- Toxicology studies on mice and rats demonstrated that the treatment does not have negative effects.
- In vitro tissue culture studies showed that finely ground clinoptilolite inhibits protein kinase B (c-Akt), induces expression of p21^{WAF1/CIP1} and p27^{KIP1} tumor suppressor proteins, and blocks cell growth in several cancer cell lines.
- These data indicate that clinoptilolite treatment might affect cancer growth by attenuating survival signals and inducing tumor suppressor genes in treated cells.

Keywords. Clinoptilolite - Adjuvant - Anticancer - Treatment

Reference 2

J Cancer Res Clin Oncol (2002) 128: 37-44, © Springer-Verlag

Immunostimulatory effect of natural clinoptilolite as a possible mechanism of its antimetastatic ability

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- *Methods:* The experiments were performed on mice. Different biochemical and molecular methods were used.
- *Results:* Micronized Zeolite (MZ) administered by gastric intubation to mice injected with melanoma cells significantly reduced the number of melanoma metastases. The lymphocytes from lymph nodes of these mice provoked a significantly higher allogeneic graft-versus-host (GVH) reaction than cells of control mice. After i.p. application of MZ, the number of peritoneal macrophages, as well as their production of superoxide anion, increased. However, NO generation was totally abolished.
- *Conclusion:* Here we report antimetastatic and immunostimulatory effect of MZ and we propose a possible mechanism of its action.

Keywords. Micronized zeolite - Clinoptilolite - Oxidative stress - Immunostimulation - T-lymphocyte - NF B

Reference 3

Zeolite '02, 6th International Conference, Occurrence, Properties and Utilisation of Natural Zeolite, P. Misaelides (Ed.): 276 – 277.

Adjuvant Effect of Natural Clinoptilolite in Anticancer Therapy

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- Clinoptilolite was ground to an average particle size of 2.9 microns and tested on mice, rats and dogs.
- Toxicology studies demonstrated the treatment does not have negative effects.
- The growth of human tumor cell lines was significantly inhibited with the doses of 50mg/ml.
- Clinoptilolite treatment of mice and dogs suffering a variety of tumor types led to an improvement in overall health status, prolongation of life span, and decrease in tumor size.

- Local application of zeolite to skin cancers of dogs effectively reduced tumor formation and growth.
- Clinoptilolite induced activation of macrophages.
- Clinoptilolite induces expression of tumor suppressor proteins and blocks cell growth in several cancer cell lines.
- Clinoptilolite might affect cancer growth by attenuating survival signals and inducing tumor suppressor genes in treat cells. They propose an immunostimulatory mechanism.

Reference 4

Zeolite '02, 6th International Conference, Occurrence, Properties and Utilisation of Natural Zeolite, P. Misaelides (Ed.): 150 – 151.

Diagnosics, Prophylactics and Healing by Clinoptilolite Zeolite

N. Izmirova *et al*, Sofia University, Sofia, Bulgaria.

- Clinoptilolite (a natural zeolite) has no carcinogenic effect on laboratory animals.
- Observed a certain tendency toward reduction in tumor formation in mice, especially the Lymphomas – Lymphosarcoma and Reticulum-cell neoplasm type B.
- Experimentally inflicted wounds treated with zeolite heal quickly. Locally applied only once to dermal wounds.
- Clinoptilolite may be applied and administered for the decrease and relief of acidity and pains in the stomach, as well as similar ailments in the abdominal area, including nutritive, alcoholic, and exo- and endo-geneous intoxications.
- Clinoptilolite may also be applied and administered in cases of enhanced cancer danger, or in the cases of natural inclination towards cancerous formations in the human body.
- Clinoptilolite may be taken prophylactically – or if required – twice daily, in doses of 2.5 to 5 grams before breakfast and before going to bed in the evening.

Reference 5

Zeolite '02, 6th International Conference, Occurrence, Properties and Utilisation of Natural Zeolite, P. Misaelides (Ed.): 95 – 96.

Interaction Studies Between Drugs and a Purified Natural Clinoptilolite

T. Farias *et al*, Zeolite Engineering Laboratory, Institute of Materials and Reagents, Faculty of Physics, University of Havana, Cuba.

- The use of natural zeolites (NZ) in animal and human health has been extensively presented in the literature.
- Purified natural zeolite, NZ, has shown good stability in its passage through the stomach, and pharmacological and clinical studies have established it does not produce any biological damage to humans.
- NZ has been used as a gastric alcalinisant and as a anti-diarrheic.
- Results show that the drugs metronidazole and sulfamethoxazole and NZ can be simultaneously administered without any loss of individual pharmaceutical effects.

Reference 6

Proc Natl Acad Sci U S A 1999 Mar 30;96(7):3463-70

La roca magica: uses of natural zeolites in agriculture and industry.

F. A Mumpton, Edit Inc., P.O. Box 591, Clarkson, NY 14430, USA.
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Many applications have been developed from natural zeolite's unique adsorption, cation exchange, dehydration-rehydration, and catalytic properties. Natural zeolites (i.e., those found in volcanogenic sedimentary rocks) are being used in the take-up of Cs and Sr from nuclear waste and fallout, as soil amendments in agronomy and horticulture, in the removal of ammonia from municipal, industrial, and agricultural waste and drinking waters, as energy exchangers in solar refrigerators, as dietary supplements in animal diets, as consumer deodorizers, in pet litters, in taking up ammonia from animal manures, and as ammonia filters in kidney-dialysis units. From their use in construction during Roman times, to their role as hydroponic (zeoponic) substrate for growing plants on space missions, to their recent success in the healing of cuts and wounds, natural zeolites are now considered to be full-fledged mineral commodities, the use of which promise to expand even more in the future.

Medical Applications

- Zeolites are being studied as buffers to reduce stomach acidity and to treat stomach ulcers.
- Zeolite powder has been found to be effective in the treatment of athlete's foot.
- Zeolite powder has been found to be effective in decreasing the healing times of wounds and surgical incisions.

Aquaculture

Natural zeolite plays three roles in aquaculture: (i) to remove ammonium from hatchery, transport and aquarium waters; (ii) to generate oxygen for aeration systems in aquaria and transport; (iii) to supplement fish rations.

Animal Nutrition and Health

Studies have shown that natural zeolite added as a dietary supplement to the rations of cattle, swine and poultry frequently has resulted faster growth relative to control groups. The animals' excrement was less odoriferous because of the uptake of NH_4^+ by the zeolite, and the number and severity of intestinal diseases decreased.

Animal-Waste Treatment

Natural zeolites are potentially capable of (i) reducing the malodour and increasing the nitrogen retentivity of animal wastes; (ii) controlling the moisture content for ease of handling excrement; (iii) purifying methane gas produced by the anaerobic digestion of manure.