Germanium-132

In its inorganic form, the trace mineral germanium is used in the electronics industry as a semiconductor, and has no nutritional or therapeutic benefits. However, in its organic form, germanium is being hailed as one of the greatest new developments in the nutritional treatment of cancer.

Organic germanium is a biological-response modifier. Biological-response modifiers are substances that can enable the body to change its response to tumors, resulting in therapeutic benefits.

Germanium does not directly attack cancer cells. Instead, it seems to stimulate the body's immune system, making it potentially effective in the treatment of cancer as well as other degenerative diseases. (8)

Background

In 1967 the late Dr. Kazuhiko Asai succeeded in synthesizing Ge-132, a form of organically bound germanium. Organic germanium can enhance the immune system, stimulate the production of interferon, and promote antitumor activity. Interferon's most important function is to augment and stimulate the body's production of natural killer (NK) cells, which directly combat cancer cells. One review of organic germanium's anti-tumor mechanisms concluded that its most important and best described activity is its ability to cause tumor regression in a wide variety of experimental models. (3)

In 1945 Dr. Asai formed the Coal Research Institute in Japan. During the process of searching for better ways to mine and use coal, he discovered that the fossilized plants in coal deposits contained substantial amounts of the trace element germanium.

Learning of reports from Russia about germanium's near-miraculous powers of rejuvenation and its use in the treatment of cancer, Dr. Asai decided to investigate its biological properties. (1) In 1969, near the end of his career as a coal engineer, he founded the Asai Germanium Research Institute so he could seriously pursue his interest in germanium.

Dr. Asai's original research, with organic germanium extracted from natural plant sources, convinced him that it could result in remarkable health benefits. However, it soon became apparent that extracting the amounts necessary to treat cancer and other diseases was too costly.

Dr. Asai finally succeeded in developing a process for producing an organic germanium, Ge-132, that was chemically identical to the form he had extracted from plants. The chemical name for this organic germanium compound is bis-carboxyethyl germanium sesquioxide. Since then several other Japanese companies have patented other processes for the production of organic germanium.

Medicinal Plants

Dr. Asai found that many of the important herbs and medicinal plants traditionally used in healing – such as ginseng, garlic, comfrey, and aloe – all contain substantial amounts of germanium. He also discovered that the amount of germanium in a plant varies according to the quality of the soil in which it grows and that adding germanium to the soil enhances plant growth. He wondered if the therapeutic benefits of these herbs were in part due to the high amounts of germanium they contain.
CHART 4

<table>
<thead>
<tr>
<th>Medicinal Plants:</th>
<th>Average Germanium Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shelf fungus (<em>Trametes cinnabarina</em>)</td>
<td>800-2,000 ppm</td>
</tr>
<tr>
<td>Garlic</td>
<td>754 ppm</td>
</tr>
<tr>
<td>Ginseng (Japanese variety)</td>
<td>260-320 ppm</td>
</tr>
<tr>
<td>Comfrey</td>
<td>152 ppm</td>
</tr>
<tr>
<td>Aloe</td>
<td>77 ppm</td>
</tr>
<tr>
<td>Chlorella</td>
<td>76 ppm</td>
</tr>
</tbody>
</table>

**Germanium: A Semiconductor**

Germanium and silicon, which are chemically related, both became well known in the computer industry for their properties as semiconductors. A semiconductor is a substance that is good at moving individual electrons, a property that makes it useful for building computer chips.

Dr. Asai believed that a semiconductor-like germanium is a key factor in the process of photosynthesis, which enables a plant to convert the energy from sunlight into microcurrents of electricity. This process provides the energy for breaking the water in a plant into oxygen and hydrogen. A plant then breathes in carbon dioxide from the air and combines it with the hydrogen to create the compounds that we call carbohydrates. The oxygen is given off by the plant into the air that we breathe. The question is "Does germanium have effects in animals and humans that are similar to those in plants?"

**Germanium: An Oxygen Catalyst**

In its organic form, each atom of germanium is bonded to three atoms of oxygen, making it an efficient carrier of oxygen. According to Dr. Stephen A. Levine, organic germanium seems to be able to partially substitute for or supplement oxygenation in living tissues. Thus, Ge-132's ability to improve the efficiency of oxygen utilization at the cellular level could be of significant benefit.

Dr. Otto Warburg, Nobel prize-winning cancer researcher, discovered that cancer cells cannot metabolize oxygen properly. Flooding cells with oxygen may retard the growth of cancer cells or even help to return them to normal.

The "boosting" of available oxygen becomes significant when we realize that the underlying cause of many chronic diseases is free-radical damage resulting from insufficient cellular oxygenation. The Ge-132 acts as a carrier, facilitating the movement of oxygen across cellular membranes to get oxygen inside the cell. Dr. Asai attributed the effectiveness of organic germanium in combating a variety of diseases to its ability to oxygenate cells. Dr. Asai found that Ge-132 was effective in treating "cancer of the lungs, bladder, larynx and breast, neurosis, asthma, diabetes, hypertension, cardiac insufficiency, inflammation of maxillary sinus, neuralgia, leukemia, softening of the brain, myoma of the uterus and hepatic cirrhosis." (1)

**Immunoenhancement**

Ge-132 normalizes and enhances many functions of the immune system. Several studies have reported orally administered Ge-132's ability to increase NK cell activity. (2, 3, 4, 6) Ge-132's ability to increase the activity of other white blood cells is also well documented. (2)
A study published in the *Journal of Interferon Research* concluded that “Organic germanium restores the normal function of T-cells, B-lymphocytes, natural killer cell activity, and the numbers of antibody-forming cells.... Organic germanium has unique physiological activities without any significant side effects.” (10)

In his book on germanium, Dr. Asai reports that his clinic has successfully treated an impressive range of ailments with Ge-132, including some types of depression, arthritis, vision problems, elevated blood pressure, heavy metal poisoning, and cancer. (1)

**Interferon Production**

Interferon, discovered nearly thirty years ago, plays an important part in our immune system, and is recognized as a powerful anticancer agent. Scientists have been searching for ways to stimulate the body’s own production of interferon.

However, most of the drugs that have been developed to increase endogenous interferon production also produce significant undesirable side effects. Ge-132 is able to stimulate the production of gamma-interferon in both animals and humans without side effects and toxicity. (2, 5)

**Clinical Tests**

In thirteen separately published animal studies, Ge-132 consistently inhibited the development of tumors and significantly increased survival times. (5) In 1985 Japanese researchers published a study stating that the antitumor action of organic germanium appears to be related to its interferon-inducing activity. (6)

A number of human cancer trials have been conducted with organic germanium. A summary of Phase I and Phase II human clinical trials reveals that orally administered Ge-132 induces interferon production, enhances NK cell activity, restores previously impaired immune response, and has extremely low toxicity.

Based on the above results, cancer researchers in Japan conducted a Phase III double-blind, placebo-controlled study to determine the effect of Ge-132 upon the response rates, survival time, and influences on clinical symptoms in patients with inoperable lung cancer who were treated with chemotherapy and/ or radiation.

The patients who received Ge-132 in combination with other therapies showed a higher response rate and improved survival time, particularly for cases of small cell carcinoma. The results indicated that the use of Ge-132 produced beneficial effects on the maintenance of the patients' immune status and general health during the period they received chemotherapy and/or radiation. The authors also reported that no major side effects were associated with the use of Ge-132.

When Ge-132 was used in combination with immunoche-motherapy, the beneficial effects included an inhibition of tumor growth, a decrease in metastasis, and prolonged survival times. Ge-132 also resulted in the recovery of lost body weight caused by chemotherapy. (4)

**Side Effects and Toxicity**

Most published studies have reported Ge-132 to be an unusually nontoxic substance. In toxicity studies, Ge-132 has been tested by various routes of administration, including orally, intravenously, subcutaneously, and intraperitoneally on mice, rats, rabbits, dogs, and human subjects.

Several minor side effects have been occasionally reported, including skin eruptions and a softening
of the stool. One study reported that since 1982 there have been eighteen cases of acute renal dysfunction or failure, including two deaths, associated with the oral intake of high doses of liquid germanium elixirs. (9) Almost all these reactions were to inorganic germanium.

Other studies cited in this chapter support the position that Ge-132 is a relatively safe cancer therapy. However, the therapeutic use of germanium should be administered only under the care of a qualified physician, with appropriate monitoring of kidney function.

Most of the research on Ge-132 indicates that it is best used as a supplemental therapy, employed in conjunction with almost any other traditional or alternative cancer therapy.

**Dosage**

Ge-132 is currently available as a nutritional supplement for oral consumption. It is available in doses ranging from 250 mg to 325 mg per capsule (or tablet). Many companies are also beginning to include smaller amounts of Ge-132 in their all-purpose, high-potency multivitamin-mineral supplement formulations.

When organic germanium is used therapeutically, as in the treatment of cancer, much higher dosages are taken. For example, in the Phase III trial of inoperable lung cancer patients, a dosage of 50 mg/Kg/day was administered orally. Thus, a 110-pound individual would need to take 10 250-mg capsules, equaling 2.5 gm per day. However, it is strongly recommended that individuals who want to take Ge-132 at higher therapeutic dosages do so only under the supervision of a physician.

At Hospital Santa Monica we have a special protocol for lung cancer patients and those with other breathing problems, such as emphysema and asthma – the inhalation of liquid Ge-132, with the use of a nebulizer to oxygenate the lungs. The nebulizer makes a micro-fine mist of the liquid Ge-132, which the patient inhales through the mouthpiece deeply into the lungs.