



## Modified Citrus Pectin

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## New Discovery in the Prevention of Cancer Metastasis

A harmless compound derived from citrus fruits prevents the spread of cancer in animal tests. If the compound proves to be as effective in human beings, it will be a significant step towards fighting cancer.

American scientists have discovered that certain sugar molecules, extracted from citrus fruits, can actually prevent the spread of prostate cancer in the bodies of animals. Thus, the study supports the fact that nutrition plays an important role in the prevention of cancer.

Dr. Kenneth Pienta, who is one of the leading scientists behind the tests, says: "To the best of our knowledge this is the first report of an oral method to prevent spontaneous prostate cancer metastasis."

The effect is explained by the fact that the special sugar molecules will attach themselves to possible cancer cells in the blood stream, and thereby prevent the cancer cells from attaching to the body's organs.

Simultaneous laboratory tests also show that this compound prevents the binding of a number of types of cancer cells taken from human beings, including breast cancer.

The special sugar molecules extracted from citrus fruits are described by the scientists as modified citrus pectin.

Pectin is found in all terrestrial plants and has always been part of the human diet. The remarkable thing about modified citrus pectin is that it can be taken as a foodstuff without any limitations.

It will take many years of clinical trials to conclude that the compound is as effective in human beings as in animals. If it proves to be as effective, modified citrus pectin could become a part of our everyday life. Dr.

Kenneth Pienta, who is the leader of Michigan Cancer Foundation, says: "Our ultimate goal may be to have men and women taken an oral form of this compound after the age of 30 like they would a vitamin. Then, if a primary malignant tumor develops, they would protect themselves



from having the cancer cells metastasize throughout the body."

Normally it takes a long time for a tumor to be discovered, e.g. by taking x-rays of the breasts. This latent period can be 10-20 years, and during this "hidden" period the tumor has time to spread throughout the body. This is why 70 percent of patients have a cancer that has already metastasized when they are first diagnosed and this is why prevention of cancer spreading is so important.

Prostate cancer is the most common cancer in men. In the United States alone, about 240-250,000 men are diagnosed with prostate cancer each year, and if it metastasizes it is incurable. By adding modified citrus pectin to the diet this metastasis. may be prevented.

Cancer covers a large variety of illnesses, where the symptoms are caused by uncontrolled cell growth in either body tissue or organs. Cancer is often complicated further by the spreading to other parts of the body. The spreading happens through cell growth into other tissues or through the lymphatic system and the blood stream to more remote areas of tissue, where independent daughter tumors develop, so called metastasis.<sup>1,2</sup>

The malignant cancer cells, which spread through the lymphatic system and the blood stream, are characterized by a high content of a special group of proteins in the cell membrane. These proteins are called galectin-3.<sup>3-6</sup> The cancer cells use galectin-3 to attach themselves to healthy cells and tissue.<sup>7-10</sup>

In recent years it has been established that special sugar molecules prevent the spreading of cancer in the body.<sup>11,12</sup> Chains of sugar molecules extracted from modified citrus pectin are particularly well suited for this job. They prevent the attachment of the cancer cell to healthy cells through a reaction with galectin-3 in the cancer cell's membrane.

In laboratory tests and in animal tests modified citrus pectin prevents the spreading of melanoma cancer when given intravenously.<sup>13,14</sup> In another recent animal test, an intake of modified citrus pectin through the daily food (oral intake) has prevented the spread of prostate cancer.<sup>15</sup> To

our knowledge modified citrus pectin is so far the first and only compound which has shown this effect when taken orally. Simultaneous laboratory tests with human cancer cells show that modified citrus pectin prevents the binding of a number of types of cancer cells, including breast cancer.<sup>16</sup>

The research team behind the tests with modified citrus pectin consists of American cancer researchers with international acknowledgement, and their test results have been published in some of the most reputable scientific publications. Furthermore, they are doing basic research which is independent from medical companies.

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