

January 2, 1974

Dr. Lewis Thomas
President
Memorial Sloan-Kettering Cancer Center
410 E. 68th Street
New York, NY 10021

Dear Dr. Thomas:

I am writing to ask if it would be possible for Memorial Sloan-Kettering Cancer Center to carry out a study of ascorbic acid as a means of decreasing the incidence of cancer and also of treating cancer.

Several months ago I had a meeting on this subject with a number of people in the National Cancer Institute. I asked the National Cancer Institute to carry out some clinical trials, but this request was rejected, and the suggestion was made to me that I make application for a grant for animal studies. I made such an application to the National Cancer Institute for a grant to the Institute of Orthomolecular Medicine. I have just been informed that a part of the proposal was approved, but was given such low priority that the grant will not be made. I have also during the past two years attempted to interest members of the staff in Stanford University School of Medicine in making some trials of ascorbic acid, but without success.

There are a few references to the use of ascorbic acid in the treatment of cancer in the literature. Two years ago, in my address at the dedication of the Ben May Laboratory for Cancer Research, I presented arguments that supported the thesis that a significant decrease in incidence of cancer might be obtained through proper use of ascorbic acid. A newspaper account of my talk stimulated Dr. Ewan Cameron, of Vale of Leven Hospital, Scotland, to begin a trial of ascorbic acid with terminal cancer patients. Also, Dr. Ewan Cameron and I prepared a paper on ascorbic acid and the glycosaminoglycans, with special reference to the treatment of cancer, and this paper has been published, after some delay, in the journal Oncology. A copy of this paper and the report of my 1971 talk are enclosed. (The delay in publication resulted from the rejection of the paper by the editorial board of the Proceedings of The United States National Academy of Sciences.)

Dr. Ewan Cameron, who is the author of a 1966 book called Hyaluronidase and Cancer and is also a Non-resident Fellow of the Institute of Orthomolecular Medicine, has during the past two years treated over two hundred terminal cancer patients with ascorbic acid alone. He has usually given the patient 10 grams of ascorbic acid by intravenous infusion over a period of about 10 days. The patients are usually by that time well enough to go home, and they continue receiving about 10 grams of ascorbic acid by mouth. Dr. Cameron is now preparing a paper describing his experience with the first 50 patients. He has reported to me that a small fraction, perhaps 10 percent, of the patients seem to have complete remission of the disease. Also, in a small fraction of the patients, perhaps less than 10 percent, the cancerous growth seems to react in a striking way to the administration of the ascorbic acid, with walling-off and necrosis of the tumor. With most of the patients the principal effect that Dr. Cameron has observed is a great decrease in the amount of pain suffered and a greatly increased sense of well-being, with disappearance of cachexia, restoration of appetite, and return of the ability to carry on a normal life. Some of the patients have, after a period of some months, suddenly become very seriously ill, dying in a day or two. Dr. Cameron has reported on the decrease in pain, which permits patients to stop taking morphine, in a brief paper, a copy of which is enclosed.

My associate Dr. Paul Wolf has carried out one preliminary study of ascorbic acid in relation to cancer in mice. The mouse, like most animals, manufactures its own ascorbic acid, and is accordingly not the best experimental animal for obtaining information that might be applicable to man, who requires exogenous ascorbic acid. The guinea pig and the monkey also require exogenous ascorbic acid, like man, and are the experimental animals of choice. In my application to the National Cancer Institute I proposed that extensive studies on ascorbic acid in relation to cancer in guinea pigs be carried out. I have not found any significant information along these lines in the literature. I proposed also that studies on ascorbic acid in relation to cancer be carried out on mice, rats, and perhaps other animals, with the idea that an amount of ascorbic acid larger than the amount manufactured by the animal might have an effect.

I believe that an increased intake of ascorbic acid would provide some protection against metastases, and I have proposed to people in Stanford University School of Medicine that studies along this line be made, but my proposal has not been accepted. One study that might be made would be to have women after mastectomy take an increased amount of ascorbic acid, perhaps four grams per day, with other women not taking this increased amount. The comparison of the incidence of metastases in the

two groups during the next few years would provide information as to the value of ascorbic acid in preventing metastases. Also, a trial might be made of an increased intake of ascorbic acid just before and just after an operation, in order to see whether it is effective in decreasing the incidence of the metastases that sometimes are formed in the area of the surgical wound. Other similar clinical studies might also be carried out.

It would, I think, also be important to institute a trial of ascorbic acid in patients with terminal cancer, in order to check the observations that are being made by Dr. Ewan Cameron.

There is, I think, the possibility that true remission of the cancer is obtained in as much as 10 percent of the terminal cancer patients. Dr. Cameron is convinced that the administration of ascorbic acid decreases pain in almost all of these patients, and leads to a very pronounced general improvement in well-being. Even if there were no other effect of ascorbic acid, the decrease in pain and increase in well-being would justify the use of this natural substance. I might mention that the amount of ascorbic acid usually used by him, 10 grams per day, is within the range that Irwin Stone and I have indicated as being the optimum intake for human beings. We think that almost all human beings are suffering from a hypoascorbemia, the result of ingesting only about 60 milligrams of ascorbic acid a day, the amount that constitutes the daily allowance recommended by the Food and ~~Research Council~~ *Nutrition P.L.*, rather than the hundred-times greater amount that corresponds to the rate at which animals such as the rat manufacture their own ascorbic acid.

I would be glad to come to New York to discuss this proposal with you. I feel strongly that the idea that ascorbic acid can contribute significantly to decreasing both the incidence and the severity of cancer constitutes a promising new attack on this important problem. I hope that you will decide to carry out both animal studies and clinical tests.

I might mention that I have been professor of chemistry in Stanford University during the past four and one-half years. I think that I am going to be put on emeritus status next July. I am Director of the Institute of Orthomolecular Medicine, which was set up by my colleagues and me earlier this year, incorporated as a non-profit foundation in May 1973. It has been granted tax status as a public foundation by the I.R.S. We have very little money as yet, and cannot carry out work on ascorbic acid in relation to cancer unless we succeed in getting a grant. I was very disappointed to have our grant application to the National Cancer Institute turned down.

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The use of natural substances, such as the vitamins, in controlling diseases is one of my principal interests at the present time — I think I can say that it is my principal interest. The principal interest of my associate Dr. Arthur B. Robinson, who is Assistant Director of the Institute of Orthomolecular Medicine, is the development of improved methods of instrumentation for analysis of body fluids, in order to permit more reliable and cheaper methods of diagnosis of disease and of following the course of diseases under treatment to be applied in the practice of medicine *and in medical research.*

Except for a few engagements during the next two or three months, I am free to come to New York at almost any time. If you are interested in giving serious consideration to this proposal, I suggest that you invite Dr. Ewan Cameron to come to New York for the conference.

Sincerely,

Linus Pauling
Director

LP:cg

Enclosures

cc: Mr. Benno C. Schmidt
Dr. Robert A. Good