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News Release

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DATE: 28 September 1979

FOR RELEASE: Immediately

LINUS PAULING REBUTS

NEW MAYO STUDY ON VITAMIN C

(September 28, MENLO PARK, Ca.)--Dr. Linus Pauling, two time Nobel Laureate and head of the Linus Pauling Institute of Science and Medicine, said today that the results of the new Mayo Clinic study on cancer and Vitamin C have been misrepesented by the Mayo Clinic investigators and in newspaper articles.

The Mayo test was intended to be closely modeled after the work of Dr. Ewan Cameron at the Vale of Leven hospital in Scotland, in which Cameron treated 100 patients with advanced cancer with high doses of Vitamin C as their only therapy after conventional treatments usually used in Scotland were no longer effective.

Dr. Pauling said that he had informed Dr. Charles G. Moertel of the Mayo Clinic in 1978 that most of the patients enrolled in the Mayo study should not have received prior chemotherapy. "Otherwise," he said, "the trial cannot be described as repeating the work of Cameron."

The Mayo study is a controlled clinical trial of the value

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of vitamin C in the treatment of patients with advanced cancer. It was carried out under the direction of Dr. Charles G. Moertel, in the Division of Medical Oncology and the Cancer Statistics Unit, Mayo Clinic, Rochester, Minnesota, with the support in part of a contract with the National Institutes of Health.

The trial was carried out because of the continued efforts of Dr. Cameron and Dr. Pauling to have the National Cancer Institute investigate this question. In 1973 Dr. Pauling went to the National Cancer Institute, in Bethesda, Maryland, in order to show officials the case histories of the first 40 patients with advanced cancer treated by Dr. Cameron with high doses of vitamin C as their only therapy, and to ask that the National Cancer Institute carry out or sponsor a double-blind randomized controlled trial, in order to check the promising observations made in Vale of Leven Hospital. The officials of the National Cancer Institute refused to carry out such a trial, however, and repeated their refusal for several years during which Dr. Pauling continued his efforts. Finally, in 1978, after he had again visited Bethesda and had urged Dr. Vincent DeVita, Chief of the Clinical Trials Section of the National Cancer Institute, to arrange for such a controlled trial and had been turned down, he wrote a very strong letter to Dr. DeVita. Dr. DeVita replied that he would see if could arrange for a controlled trial to be made, and later he informed Dr. Pauling that Dr. Moertel of the Mayo Clinic had agreed to carry it out.

When the study was being planned Dr. Moertel wrote to Dr. Pauling that he wanted to repeat the Vale of Leven trial as closely as possible. Dr. Pauling then wrote him that to do

so would require that his terminal cancer patients not have received heavy doses of cytotoxic chemotherapy, because this chemotherapy damages the immune system and may prevent the vitamin C from being effective. The following sentences are from Dr. Pauling's letter of 9 August 1978 to Dr. Moertel:

"In my last letter to you I pointed out to you that the patients studied by Dr. Cameron had not received chemotherapy. The cytotoxic drugs damage the body's protective mechanisms, and vitamin C probably functions largely by potentiating these mechanisms. Accordingly, if you hope, as you stated in your letter, to repeat the work of Cameron as closely as possible, you should be careful to use only patients who have not received chemotherapy... On page 2 (of your letter) there is no mention of earlier chemotherapeutic treatment as a contraindication for patient eligibility. I think that this question might be important, however, and I recommend that you be sure that there are a sufficient number of patients enrolled who have not received chemotherapy. Otherwise the trial cannot be described as repeating the work of Cameron."

In fact, when the paper on the Mayo Clinic trial was published (Creagan, E. T., Moertel, C. G. et al., "Failure of high-dose vitamin C (ascorbic acid) therapy to benefit patients with advanced cancer," New England J. of Medicine, September 27, 1979) it was seen that Dr. Moertel had ignored this advice. The authors state that 50 of the 100 ascorbate-treated patients in the Vale of Leven study had received chemotherapy and high-energy radiation, whereas in fact only

4 had received chemotherapy and only 20 had received high energy radiation. The failure of the investigators to observe a large effect of vitamin C in their patients shows, as Dr. Cameron and Dr. Pauling had predicted, that the value of vitamin C is much less for patients whose immune systems have been damaged by chemotherapy than for those who have not received chemotherapy.

Dr. Pauling believes the Mayo Clinic study has answered an important question. Dr. Cameron and Dr. Pauling have pointed out that chemotherapy badly damages the body's natural protective mechanisms, especially the immune system, and that, inasmuch as vitamin C is effective against cancer largely by potentiating these mechanisms, patients who have been treated with chemotherapy probably would not respond well to treatment with vitamin C, but Dr. Cameron and Dr. Pauling did not have reliable information as to how great this effect would be. The Mayo Clinic study seems to substantiate this, showing patients who have received treatment with chemotherapy respond very poorly to subsequent vitamin C therapy. Adults with solid tumors in Scotland usually are not treated with chemotherapy because experience has shown that the benefit is small. On the other hand, the benefit of treatment with vitamin C is large, having the important advantages that it is inexpensive and that it increases the patient's sense of well-being, permitting him usually to lead a good life.

Dr. Cameron and Dr. Pauling have urged the National Cancer Institute to sponsor another controlled trial, with patients

with advanced cancer who have not received treatment with cytotoxic chemotherapeutic agents, but it is still uncertain as to whether this trial will be carried out.

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Advisory to Editors:

Dr. Pauling will be available for some personal interviews on this subject if there is continuing interest. Those interested should call the contacts listed above.