205D
Univ. California
Radiation Lab

FEB 3 - 1938

UNIVERSITY OF CALIFORNIA
RADIATION LABORATORY
BERKELEY

November 10, 1937

WW FBH NOV 12 '37 FEB AEB

WW FBH FEB and 11/13

Dear Dr. Weaver:

I believe the enclosed* statement and copy of my letter of October 14 cover all the essential points. The statement, however, may be rather longer than convenient for your purposes, and the following summary may prove more useful.

* Statement copied, & sent in duplicate to Lt. Governor P.M. Herbert of Ohio by FBH 1/3/45.

The work of our laboratory during the past six years has been largely devoted to the development of the cyclotron and its use in nuclear research. It was not long before the cyclotron became very useful and opened up a vast field for investigation. In the past few years many contributions have come from our laboratory concerning many and varied nuclear reactions throughout the periodic table.*

Particular attention has been given to artificial radioactivity. Many radioactive isotopes have been discovered (more than 200 are now known), and many of them have been produced in large amounts, equivalent in order of magnitude of activity to a gram of radium. The properties of many of these radioactive bodies have been studied in detail, thereby contributing to fundamental knowledge of the properties of nuclei.

A great deal of work with neutrons also has been made possible by their enormous output from the cyclotron. Extensive investigations have been made of the properties of neutron rays, and especially they have been used in nuclear reactions in which radioactive isotopes are formed.

During the past two years a significant beginning has been made on biological applications of these recent developments in nuclear physics and the importance of this aspect of the work of the laboratory cannot be over-estimated. Studies on the biological action of the neutron rays have established that they produce biological effects quite different from those produced by x-rays, shedding light on fundamental questions of biological processes induced by ionizing radiations. The experiments on the comparative effects of x-rays and neutrons on tumor tissue indicate that neutron rays may prove to be of great value in the treatment of neoplasms.

The artificial radioactive substances have been used as tracer elements by our chemical and biological colleagues, with conspicuous success. Thus, for example, the chemists have been able to establish some of the chemical properties of Element 43 and the exchange of chlorine in certain reactions, while the biologists have traced phosphorus in animals and in particular have obtained important data on the phosphorus metabolism of leukemic mice and the formation of phospholipids. The metabolism of sodium in human beings has been followed in considerable detail, using radio-sodium.

---

* I have not included a bibliography of publications in nuclear physics, which is rather long and presumably not of immediate interest here.

The first experiments on the clinical use of the artificial radioactive substances (radio-sodium) have been made during the past year, with suggestive results.

The laboratory facilities are being made increasingly available to the biologists and at the present time, in addition to continuation of the above mentioned investigations, new projects are being undertaken. For example, Professor Greenberg of Biochemistry is beginning a study of the role of Vitamin D in ricketts, using radio-phosphorus and radio-calcium as tracers, and we will soon furnish Dr. Whipple of the University of Rochester adequate supplies of radio-iron for his important work.

As you know, the new laboratory is intended primarily for the biological and medical work. We expect that the new cyclotron, which will weight about three times as much as our present one, will reach ultimately voltages in the neighborhood of 20 million and produce neutron rays and the artificial radioactive substances in sufficient abundance for extensive use by our colleagues in chemistry, biology and the Medical School, both here and to a certain extent elsewhere. We are planning to equip the laboratory not only with a cyclotron and its immediate accessory equipment but also as a biological laboratory, as much of the biological research will necessarily have to be carried out in the proximity of the cyclotron. The new laboratory building is nearing completion, and soon we will begin the installation of equipment.

As indicated in my letter of October 14th, in addition to the funds for the building and its equipment already provided, there is a need for $30,000 to complete the essential equipment. Inasmuch as the installation of equipment will necessarily require many months, the additional funds will not in actuality be needed before the next calendar year, but of course we cannot proceed with plans for the coming months without assurances that needed support will be forthcoming. I know that you feel as I do that the biological program is extremely important, and I sincerely hope that the Foundation will find it possible to provide the additional funds which will mean so much in furthering the work.

With much appreciation and kindest personal regards,

Sincerely yours,

Ernest O. Lawrence

Encl.

Dr. Warren Weaver
Director of the Natural Sciences
Rockefeller Foundation
49 - 49th Street
New York City, New York

PS -
President Sproul is writing you directly in support of this application.