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UNIVERSITY OF CALIFORNIA

DONNER LABORATORY AND DONNER PAVILION
BERKELEY 4, CALIFORNIA

August 11, 1964

Dr. Charles Dunham
Medical Branch
Division of Biology and Medicine
U. S. Atomic Energy Commission
Washington 25, D.C.

Dear Dr. Dunham:

You probably know that for about a year now we have been producing Fe-52 at the 88" cyclotron for medical use. This isotope is a positron emitter with a half life of 8.2 hours. With it and the positron scintillation camera we have been mapping the distribution of erythropoietic marrow in normal subjects and those with hemopoietic diseases. To produce Fe-52 we bombard natural chromium with alpha particles and with a two hour bombardment we obtain 100 to 200 microcuries.

Dr. Saul Winchell has pointed out that Fe-52 should be an ideal isotope to deliver therapeutic doses of radiation to the bone marrow for treatment of polycythemia vera. The reason, of course, is that iron goes directly to the blood forming tissue and to no other organ in the body. The situation is analogous to uptake of I-131 by the thyroid gland. Dr. Winchell and I have estimated that 1 to 5 millicuries of Fe-52 would be necessary to deliver a therapeutic dose of radiation to the marrow in polycythemia vera. The only feasible method of obtaining millicurie amounts of Fe-52 with the 88" cyclotron is to begin using enriched Cr-50 for our cyclotron targets instead of natural chromium. Fe-52 is produced almost entirely by the $Cr^{50}(\alpha, 2n)Fe^{52}$ reaction. Since natural chromium obtains 4.3% Cr-50, we can obtain a factor of 10 or 20 increase in yield by going to the enriched material. Therefore our yield should be somewhere between 1 and 4 millicuries for 3 hours bombardment. Each of our targets contains 8-10 grams of chromium. We should be able to recover a large percentage of the enriched chromium from our spent targets, but just what the recovery percentage will be, we won't know until we try.

Mr. Steward Lichliter of the Lawrence Radiation Laboratory Director's Office advised me thoday that he has just learned that the Cross Section Pool has 50 grams of 95.9% enriched Cr-50. I would like to enlist your support to help us obtain 5 grams for use in producing Fe-52 for therapeutic purposes. The cost of the material when purchased in large quantities is approximately $3.00 per milligram. Therefore the cost of 5 grams would be $15,000.

Mr. Lichliter suggested we might be able to obtain the material without a transfer of funds if you support the project. We would like to put the request for this material through the Director's Office of the Lawrence Radiation Laboratory if you approve. Granting this request would enable us to enable us to enlarge the scope of our work with this interesting isotope.

Sincerely yours,

H. O. Anger

HOA/tt
cc: Lichliter, Winchell

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