

DOCUMENT SOURCE Lawrence Berkeley Laboratory Archives and Records Office	
Records Series Title	<i>Life Sciences - Scientists' Papers - John Lawrence</i>
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File Code No.	<i>19-14-6</i>
Carton No.	<i>0</i>
Folder No.	<i>H-6 1944</i>
Notes	<i>Argon, Krypton & Xenon</i>
Found By	<i>Karen Holmes</i>
Date	

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DIVISION OF MEDICAL SCIENCES Aero Medical Unit
COMMITTEE ON AVIATION MEDICINE Donner Laboratory
Berkeley 4, California

October 4, 1944

Major Allan Hemingway, A. C.
AAF School of Aviation Medicine
Randolph Field, Texas

Dear Major Hemingway:

Your letter of September 26, 1944 to my brother, Professor Ernest O. Lawrence, has been turned over to me for answering. Radioactive sodium, with a half life of around 14 ~~days~~ ^{hours}, is the isotope which has been used mostly in the circulation studies and it is quite easily made in large quantities in the cyclotron. This is Na²⁴ and it emits a hard beta ray and hard gamma ray.

If you were close to a source of this material it would be a practical isotope to use. At the present time our cyclotron is not in operation but it probably will be in operation again within a month. I believe the closest cyclotron to you is the Washington University cyclotron in St. Louis. Na²², with a half life of 3 years emits positrons and gamma rays but it is more difficult to make in large quantities, but as far as I know it has never been used in biological or medical investigations.

There are four radioactive isotopes of chlorine, Cl³³, Cl³⁴, Cl³⁶ and Cl³⁸. Cl³⁶, with a half life of over a year would be the only isotope which could be used because the others have very short half lives. I do not know of anyone who has used this isotope, however. In our work here we have used several of the radioactive isotopes in investigations in the field of aviation medicine during the past three years. We have found for studies of circulation that some of the radioactive gases are of very great value, particularly radioactive argon and radioactive krypton and radioactive xenon, with half lives that are quite convenient.

I am enclosing a copy of one paper showing how one of these isotopes has been used in studying the effects of drugs on the vascular tree of a dog's hind limb. Numerous studies of this type have been completed and are in progress here on young subjects. These isotopes might be of interest to you in your circulation studies.

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Major Allan Hemingway

October 4, 1944

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After we are again able to produce radioactive isotopes I believe we could furnish you the long life isotopes and ven the short life Na, but there will be considerable loss during shipment. Radioactive xenon, with a half life of 34 days, we could also send to you.

I will talk the problem over with Dr. Hamilton, who has charge of producing all the radioactive isotopes, when he gets back. Also Dr. Tobias, the biophysicist on our staff, is going to Wright Field in connection with a project we have there, and he could swing around by Randolph Field to see you and see if we could help you on your problem.

Assuring you of our wish to be of assistance,

Yours sincerely,

John H. Lawrence, M. D.

JHL:ep

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