

DOCUMENT SOURCE	
University of California at Berkeley The Bancroft Library/The University Archives, Berkeley CA	
RECORDS SERIES TITLE	
Calif. Univ. President Carver Papers	
BANCROFT/UARC ID NO.	
CU-5	
CARTON NO.	COPY
889	
FOLDER NAME	
644-L	
NOTES	
C14, radioactive iron, radioactive S <sup>35</sup> (348) Red Blood Cells --- Neoplasia/Anemia	
FOUND BY/DATE FOUND	
R. Landazuri 12/14/94	

723464

## BEST COPY AVAILABLE

Copied from originals in The Bancroft Library for  
 reference use only. This copy may not be deposited in  
 other libraries without the express per-  
 mission of The Bancroft Library. The Bancroft Li-  
 brary upon request will furnish information  
 to reproduce or to obtain copies of the original  
 writing from the University of California Library, Uni-  
 versity of California, Berkeley, California 94720.

PROGRESS REPORT FOR PERIOD JUNE 1, 1951 - MAY 31, 1952

Grant No C 1440 (CS)

Measurement of the Life of the Red Blood Cell in Neoplasia and  
the Anemias.

John H. Lawrence and Nathaniel I. Berlin, Donner  
Laboratory, University of California

Date of Preparation - June 6, 1952

## Summary Statement

This project has been under way for the past year, and during this time 16 patients have been studied -- nine with leukemia, two with carcinoma, one with lymphosarcoma, one with nephritis, one with myelosclerosis, one with aplastic anemia, and one with a clinically unclassifiable anemia. The data indicate that the red cell life is uniformly shortened in patients with myelogenous leukemia, being in the neighborhood of 75-85 days in the four patients studied. In lymphatic leukemia, the picture is variable, patients having a red cell life varying from 20 to a normal of 120 days. In one patient with nephritis, a decrease in the red cell life span was observed. One patient with aplastic anemia had a short red cell life span of approximately 30 days. One patient with myelosclerosis and one patient with lymphosarcoma are being studied at the present time and as yet no conclusions can be drawn. One patient with carcinoma of the breast had a normal cell life, and one patient with a malignant melanoma could not be followed for a sufficient period of time to determine the red cell life.

1166127

DOCUMENT SOURCE	
University of California at Berkeley The Bancroft Library/The University Archives, Berkeley CA	
RECORDS/SERIES TITLE	
Calif. Univ. President Corres. Papers	
BANCROFT/UARC ID NO.	
CU-5	
CARTON NO.	COPY
829	
FOLDER NAME	
644-L	
NOTES C14 radioactive iron, radioactive glycine 14 of 18 Red Blood Cells... Neoplasia/Anemias	
FOUND BY/DATE FOUND	
R. L. Langstaff; 12/14/44	

-2-

In summary, in the neoplasias and certain anemias an alteration of red cell life span is an important factor in the pathogenesis of anemia.

**PART B Full Statement of Progress**

The patients were studied with glycine-2-C-14 for the determination of the life span of the red blood cell. These patients were given 100 microcuries of radioactive glycine intravenously, and blood samples were taken at frequent intervals thereafter. The plasma was removed from each sample by centrifugation. The cells were then washed three times with saline, lysed in distilled water, and the lipids extracted with toluene. The hemoglobin solution was then dried, combusted to CO<sub>2</sub> with a chromic-sulphuric acid mixture. The resulting carbon dioxide was precipitated as barium carbonate and the specific activity measured in a 100-cc ionization chamber at atmospheric pressure using a vibrating reed electrometer and a recording potentiometer. The specific activity of the hemoglobin was plotted as a function of time, and from the resulting graph the red cell life span could be determined, as shown by Shemin and Rittenberg.

These studies show that in the patients with chronic myelogenous leukemia there was a shortening of the red cell life span from a normal of approximately 120 days to 75-85 days. In the five patients studied with chronic lymphatic leukemia one patient who was in an excellent clinical and hematological

Copied from originals in The Bancroft Library for reference use only. Copies may not be deposited in other libraries without the permission of the University of California, Berkeley. Progress Report on the Life Span of the Red Blood Cell in Neoplasia and Anemia, 1944-1945.

DOCUMENT SOURCE	
University of California at Berkeley The Bancroft Library/The University Archives, Berkeley CA	
RECORDS SERIES TITLE	
Calif. Univ. President Corres. Papers	
BANCROFT/UARC ID NO.	CU-5
CARTON NO.	829
<b>COPY</b>	
FOLDER NAME	
644-2	
NOTES (4) radioactive iron radioactive glycine Red Blood Cells -- Aplasia/Anemias 15/18	
FOUND BY/DATE FOUND	
B. Lazari 12/14/64	

-3-

Copied from original in The Bancroft Library for  
 reference purposes. This copy may not be deposited in  
 the Bancroft Library. For more information, contact  
 the Bancroft Library, University of California, Berkeley,  
 CA 94720.

remission at the time had a normal red cell life span of approximately 120 days. One patient who was in a terminal state of the disease showed a red cell life span that could not be determined by the method of Shemin and Rittenberg since the results indicated an almost random destruction of red cells. This man had a marked hemolytic component, not clinically manifested, and was anemic because of the rapid destruction of red cells, although he continued to produce a normal number of red cells as determined with radioactive iron.

Two patients with carcinoma were studied -- one patient with carcinoma of the breast in whom blood volume studies showed a mild anemia had a normal red cell life span. One patient with a malignant melanoma could not be followed for a sufficient period of time to determine the red cell life. One patient with chronic nephritis was found to have a red cell life of approximately 70 days, explaining in part the anemia in this patient. One patient with lymphosarcoma is now under study, and already there is evidence of a short red cell life. One patient with myelosclerosis is being studied at the present time. One patient with aplastic anemia was found to have a normal production rate as determined by radioactive iron and found to have a red cell life of approximately 30 days with the radioactive glycine, so that this patient is anemic not by virtue of a decrease in production but as a result of a hemolytic component which was not determinable by the usual clinical methods. One patient with an anemic not classifiable clinically had a normal



DOCUMENT SOURCE	
University of California at Berkeley The Bancroft Library/The University Archives, Berkeley CA	
RECORDS SERIES TITLE	
Calif. Univ. President Carneg. Papers	
BANCROFT/UARC ID NO.	
CU-5	
CARTON NO.	COPY
829	
FOLDER NAME	
644-2	
NOTES	
C14, radioactive iron, radioactive glycol Hb Blood Cells and Megaloblasts	
FOUND BY/DATE FOUND	
R. Hernandez 12/14/94	

Copied from originals in The Bancroft Library for  
 reference only. Copies may not be deposited in  
 other libraries without express per-  
 mission of The Bancroft Li-  
 brary. For research, permission  
 must be obtained in  
 writing from The Bancroft Library, Uni-  
 versity of California, California, 94720.

technique. It is hoped that by these combined studies we shall  
 be able to determine: (1) the rate of production of cells by  
 the patient, (2) the life span of the patient's own cells, and  
 (3) the life span of red cells transfused to the patient from  
 a normal donor. This, we hope, will enable us to determine  
 whether the decrease in life span is due to factors produced  
 within the cell at the time of production or whether it is extra-  
 corpuscular and acts on all red cells indiscriminately, and thus  
 with the radioiron data to describe completely the mechanism  
 underlying the development of anemia in these disease states.