The Committee on Clinical Investigations and Use of Radioisotopes hereby approves the program with the following title:

CIRC #30 has been assigned to this program.

The Committee suggests that this study would be improved if 3 leukemics and 2 hematologically normal individuals were included. On direct questioning, Dr. Atkins stated that this material will be sterilized by autoclaving and only pyrogen free ingredients will be used.

The Medical Research Center
Brookhaven National Laboratory
Upton, L. I., New York

REPOSITORY Records Holding Area Bldg. 494
COLLECTION Committee Clinical Investigations and Use of Radioisotopes
BOX No. 4
FOLDER CIRC 30

Date: April 14, 1967
Place: Medical Research Center
Brookhaven National Laboratory
Upton, New York 11973

Approval recommended __ Date 4/20

Disapproval Date

V. P. Bond, M.D.
Chairman, Medical Department
FORM FOR INITIATION OR REVIEW OF CLINICAL INVESTIGATIVE PROGRAMS

(Submit original only to Department Chairman)

A. Title of the proposal: Comparison of a technetium colloid prepared by two different methods.

B. Sponsoring physician(s): J. S. Robertson

C. Responsible investigator(s): H. L. Atkins

D. Brief description of the study, including its general goals and purpose, and pertinent information on past studies: (Attach additional sheets if necessary.)

We are now using a technetium sulfur colloid prepared by bubbling \( \text{H}_2\text{S} \) through a solution of pertechnetate in 1% gelatin. An alternate method is that of Stern et al in which 3.0N sulfuric acid and 0.8% sodium thiosulfate are added to form the colloid. It is a more simple method but the colloid size is larger. It is our contention that the latter method is not suitable for producing colloid for bone marrow scanning. We have used both colloids in mice and rabbits and have found a marked difference in favor of \( \text{H}_2\text{S} \) method for marrow localization in mice and a slight difference in rabbits. We would now like to make a comparison in humans.

E. Reasons why the investigation(s) are to be performed on human subjects.

There are species differences as evidenced by our results in mice and rabbits.

F. Type of patient in which the study is to be done (including approximate number of subjects, if known; special restrictions or requirements; method of obtaining consent; etc.):

Five patients with leukemia who are to have spleen scans during their evaluation or treatment periods will have scans performed first with the colloid formed by \( \text{H}_2\text{S} \) and two to three days later a repeat study with the thiosulfate colloid. The ratio of maximum counts over the liver to the count rate over spleen and sacrum will be determined in each case. Dose will be 5 mCi except when a marrow scan is desired when 1 mCi will be administered.
G. 1. Are drugs not in the U. S. Pharmacopoeia (USP) or the NNR being used or contemplated for use? Yes X No

2. Is an unusual use of a drug(s) accepted by the USP or NNR contemplated? (An example would be the use of an accepted drug in dosages far exceeding the recommended limits or for purposes distinctly different from the usual indications cited.) Yes No X

3. Are any biological products to be administered that do not bear on their containers or labels notation of approval by the Biological Control Division of the National Institutes of Health? Yes No X

4. Is external or internal radiation other than accepted diagnostic or therapeutic procedures to be administered? Yes No X

5. Are any (other) unusual procedures being performed or proposed which in your judgment may entail a special hazard - particularly a hazard above and beyond any imposed by accepted diagnostic and therapeutic measures for that patient? Yes No X

6. Are any radioisotopes to be administered to human beings? Yes X No

   a. If yes, are the radioisotopes to be used solely within the limits of procedures, specifically described in the USP? Yes No X

      Describe the radioisotopic preparation(s): 99m Te-sulfur colloid

   b. Or are the radioisotopes to be used only in accordance with a project previously approved by the former Radioisotope Committee of this Department? Yes X No

      Note the project number: 15

IF ANY OF QUESTIONS 1 THROUGH 5 ARE ANSWERED AFFIRMATIVELY, a detailed analysis of the potential hazards must be appended, including pertinent bibliographic citations and other relevant information.

IF QUESTION 6 IS ANSWERED AFFIRMATIVELY, a completed supplementary form for Radioisotope Administration to Human Beings must be appended. However, this form need not be filed provided that question 6a or 6b is also answered affirmatively. A separate form must be submitted for each radioisotopic species to be administered.

Committee on Clinical Investigations and Uses of Radioisotopes
Approval recommended Date
Disapproval Date

V. P. Bond, M. D.
Chairman, Medical Department

Sponsoring Physician

6/25/63
SUPPLEMENTARY FORM FOR RADIOISOTOPE
ADMINISTRATION TO HUMAN BEINGS

A. Radioisotope

1. Species: (Radioisotope or labeled compound, eg. Na$^{24}$Cl or C$^{14}$ glucose) $^{99m}$Tc - sulfur colloid

2. Physical characteristics: (Physical half-life; decay scheme (or type, energy and relative frequency of major emissions)

   $^{99m}$Tc: $\frac{T_{1/2}}{6}$ hrs $\rightarrow$ $^{99}$Tc

3. Source: (BNL reactor, cyclotron, hot lab.), commercial supplier, etc.)

   Hot Lab

4. Preparation: (Target material, quantity, special problems)

   at Hot Lab by method of Stern, McAfee and Subramanian

5. Specific activity and isotopic purity of administered material:

   carrier free

6. Radioassay and calibration procedures: (Include validation to be performed at BNL prior to use)

   at Hot Lab

7. Vehicle and route of administration:

   In 1% gelatin, intravenously

8. Procedures for control of sterility and pyrogenicity: (Or note that commercially supplied isotopes are certified as ready for administration to human beings.) As previously stated in prior application.

9. Extraneous effects, if pertinent: (Such as pharmacological or toxic actions of the parent compound or vehicle, etc.) None

B. Radiation Dosage

1. Biological half-life or half-lives, including slow components:

   As before. $T_{eff}^{1/2} = T_{physical}^{1/2}$

2. Organ, cellular, or subcellular localization: (Should account for the effects of special drugs or agents on altering the natural distribution of the radioisotope)

   a. Critical or "target" organ(s): Liver $96\%$

   b. Gonadal exposure: 0.02 rad/10mCi
3. Sample calculations: (Dosage should be calculated for the whole body and for "target" or other separate organs, where indicated) Summary equations are desired; not extensive calculations. Standard dosage equations from references such as Hine and Brownell's *Radiation Dosimetry*, National Bureau of Standards Handbook 69, and BNL Hospital Form 1167-A should be used where possible and the reference cited.

See previous application

C. Radiological Health Aspects

1. Hazards to other patients and to personnel from external or internal radiation: None

2. Monitoring procedures, if necessary: None

3. Special procedures for handling waste products, excreta, biological samples, etc., where indicated: None

4. Plan for isotope accountability, if required: None

June 25, 1963
A Relationship Between Spontaneous and Radiation-Induced Loss of Specific Molecular Structure. H. A. Johnson. Accepted by Radiation Research.


Brookhaven Lecture Series. The Cellular Basis of Acute Radiation Death in the Mammal. V. P. Bond. No. 63, February 8, 1967