701817 PNL-9505

bcc: J. Park
W. Wiley
R. Bunnell
J. Jarrett
W. Riemath
H. Parker←

Battelle
Pacific Northwest Laboratories
Battelle Boulevard
Richland, Washington 99352
Telephone (509) 942-3044
Telex 36921

March 13, 1979

Dr. R. O. Baukol
3M Company
Box 33600
St. Paul, MN 55133

Dear Dr. Baukol:

I note in the December 31 issue of Biomedical Technology that your company is now producing radiation sources for the treatment of prostatic tumors. I am writing to call your attention to some related work done in our laboratory.

For the past several years, we have been developing a fully portable blood irradiator. In the course of this work we have considered the use of a wide variety of isotopes as radiation sources, including ^{125}I. We abandoned ^{125}I because of its high cost and have been using ^{170}Tm. The ^{170}Tm, as we use it, has some distinct advantages which may apply to your situation: (1) Its primary emission is a beta particle (1 MeV max) and thus has a slightly higher potential for causing biological damage than the photons emitted by ^{125}I. (2) We construct our irradiators from nonradioactive ^{169}Tm and, following encapsulation in vitreous carbon, the material is activated to ^{170}Tm. (3) The fabrication of the encapsulated sources is both simple and inexpensive and a substantial supply could be produced without losses due to decay. The decay loss occurs only following neutron activation. The half-life of the ^{170}Tm is 129 days which should permit disappearance of the radiation in a timely fashion. The vitreous carbon is inert so that removal of the seeds would not be needed, as with your present seeds.

I am enclosing a reprint of our paper describing the blood irradiator since it may help clarify how the seeds might be made. If you find the concept of using ^{170}Tm as having possible advantages worth pursuing, please don't hesitate to call or write. My phone number is (509) 942-3044.

Sincerely yours,

Frank P. Hungate

F. P. Hungate, Ph.D.
Staff Scientist
Biology Department

FPH:lmd
enclosure

REPOSITORY PNL, Engr. Bldg, Area 3000
COLLECTION Blood Irradiator
BOX No. 2951
FOLDER DHSC 78-8

HUMAN SUBJ.
MAR 13 1979
COMMITTEE

0009689

50 Years of Service
1929-1979