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To: Mr. Kevin Null From: M. S. Islam
Fax: (630) 515 1078 Pages: (including cover sheet) 3
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Kevin G. Null
Material Licensing Section
U.S. Nuclear Regulatory Commission
Region III
2443 Warrenville Road
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July 11, 2007

Dear Mr. Null:

In response to your inquiry during our telephone conversation today, a sheet containing additional information about Dr. Walker's experiences for the usage of radionuclide is enclosed.

If you have any question, please let me know.

Sincerely,

Mohammed S. Islam
Radiation Safety Officer
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Radionuclide usage experiences of T. Stuart Walker

1. Types of radionuclide used, and amounts:

- a. ^{32}P : Usually used 1 mCi at a time. Total usage of ^{32}P over 30 years is probably around 150-200 mCi.
- b. ^{14}C : usually ordered about 250 uCi at a time, and each experiment utilized 5-25 uCi. Total usage of ^{14}C over 30 years was probably around 40-50 mCi.
- c. ^3H : usually ordered around 100-250 uCi at a time, and each experiment utilized 10-20 uCi. Total usage of ^3H over 30 years was probably around 75-100 mCi.
- d. ^{125}I : usually ordered kits containing under 25 uCi. Total usage over 30 years was probably around 2 mCi.

2. Types of experiments performed:

- a. ^{32}P -ATP was used to label intracellular microorganisms (rickettsiae). Pulse/chase experiments were used to locate rickettsiae within cell culture systems and to monitor their activities.
- b. ^{14}C and ^3H were purchased as labeled amino acids, nucleic acids, sugars, and fatty acids. Experiments included double-label transport studies, and studies investigating the production of membrane lipids under various conditions. Analyses involved liquid chromatography, liquid scintillation of cellular digests, and various forms of gel or gas chromatography. Some studies examined incorporation of radioactive precursors into chromosomes and plasmids, and involved gradients spun in ultracentrifuges. ^{14}C glucose was used in some experiments to detect the presence of $^{14}\text{CO}_2$ generated by leukocytes during inflammatory processes.
- c. ^{125}I was used in various diagnostic kits (radioimmunoassay). A few RIAs also were based on ^3H -containing compounds. RIAs were used to detect trace amounts of materials in clinical samples and in cell culture supernatants.