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ANNUAL REPORT

RADIOACTIVITY RESEARCH CENTER

7/1/65 6/30/66

Description of services and staff 1 - 4

List of campus projects by investigator 5 - 19

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2) Localization of human tumors especially brain using Se-75 and scintiscanning: Scott, Cavalieri.

High specific activity Se-75 is pharmaceutically refined and given to patients as the selenite. The convenient physical decay of this radioelement and its incorporation into tumors primarily in protein and apparently not to the same extent in abscess or hemorrhagic areas makes this relatively inexpensive isotope useful in tumor scanning. Studies with a multichannel analyzer and phantoms have allowed us to calculate the radiological dose which is about 1.1 rads when 4μc/Kg body weight is administered. The relatively long half life allows repeated scanning over a period of days with administrations of such microgram amounts of Selenium.

3) Metabolic pathways of selenium compounds bound in vivo: Cavalieri, Scott.

Studies to date have shown that selenium is primarily bound in protein and is associated with the alpha 1, 2 globulins in plasma. Relatively high concentrations are found in white cells and platelets allowing them to be effectively tagged. White cell amino acid kinetics and protein binding sites for selenium are being studied.

4) Investigation of trace elements in specimens of biological origin using neutron activation and multichannel gamma ray spectrometry: Scott, Peng, Vogel, Jergesen, Cavalieri, Greenspan

This unit has now been installed and sufficiently shielded so that calibration of neutron flux and ultimate sensitivity can be carried out. This makes possible the sensitive detection of such elements as Li, O, F, Na, Mg, Al, Si, P, S, Cl, A, K, V, Cr, Mn, Fe, Co, Ni, Cu, Zn, Sr, and others. Fluxes higher than $1 \times 10^{10}/cm^2$ will be made available at the nuclear reactor now funded on the Berkeley Campus, Department of Nuclear Engineering.

RADIOCHEMISTRY

C. T. Peng, Ph. D.:

On sabbatical. To be transferred 0.5 time to School of Pharmacy in recognition of teaching duties.

K. G. Scott, Ph. D., Cordelia Porter

During the year we have set up a milking program for the production of ^{99m}Tc from ^{99}Mo which is supplied as the pertechnate ion and in various colloidal forms for use in patients. This expanded radiochemical program will require an enlargement of our radiochemical staff primarily in organic and colloidal chemistry. Part of this may be subsidized by an increase in recharges via '29' funds.

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STIGATOR	PROJECT AND/OR ISOTOPE
SCOTT, K. G., Ph. D.	Se-75

To be pharmaceutically refined for tumor localization studies.

C-14

C-14 labeled silicone to investigate transport of silicone in spinal fluid.

Any and All Isotopes

For use in class in which principles and practices of radiation protection, radioactivity measurement, standardization and monitoring techniques, mathematics and calculations basic to the use of measurement of radioactivity are taught and in which tracer studies are taught.

Cs-137

To calibrate instruments.

H-3; Ra-226; Neutron Source

Sealed source.

[redacted]

Cancer Research: A study of the biological uptake of this radioisotope in red cells from normal and tumor-bearing patients.

Se-75

The bone marrow of animals will be labeled with Se-75 by intraperitonea. injection of selenite and samples will be studied to establish turnover rates of stem cells, granulycite survival, etc.

I-129

Radiochemical studies only.

SHELINE, Glenn, M.D. — Any and All

For routine clinical tests.

SMITH, Lloyd, M.D. — C-14; S-35

Various C-14 and S-35 labeled intermediates in the study of hyperoxaluria, orotic aciduris and cystinosis.

STARK, Marvin M., DDS — Ca-45

For root canal studies in extracted teeth.

C-14

Rate of absorption of epinephrine from gingivae.

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