Summer Student Research Program
Project Description

FACULTY SPONSOR’S NAME AND DEGREE: Lionel S. Zuckier, MD
PHONE: (973) 972 - 6023
DEPARTMENT AND INTERNAL MAILING ADDRESS: UH H-125
E-MAIL: Zuckier@umdnj.edu

PROJECT TITLE (200 Characters max):
Analysis of Serial FDG PET-CT Studies in Oncology Patients.

HYPOTHESIS:
Clinically useful information can be obtained from studying variation in “normal variants” on sequential PET-CT studies.

PROJECT DESCRIPTION (Include design, methodology, data collection, techniques, data analysis to be employed and evaluation and interpretation methodology)

This is a new project that will entail image processing and evaluation of the data.

The NJMS PET-CT unit has been operational for over 7 years. Patients with cancer are often monitored during and following therapy at regular intervals. For therefore have a large cadre of patients that we have served with multiple scans.

Many normal variants of FDG uptake have been described on FDG PET scanning (i.e. variable colon, cardiac, muscle uptake), and other changes that are related to therapy (i.e. marrow, lung, esophagus, mucosal uptake). These have been well-described in the imaging literature; however, to our knowledge, no one has rigorously analyzed the stability and variation of these findings over multiple sequential studies.

Because our PET-CT scans are stored on a PACS system, we can readily search for patients with multiple studies, and retrieve their image for analysis. We propose a 4-part project. (1) Review of the literature (with supervisor guidance) to list findings that can be considered normal variants, or benign post-therapy changes. (2) Review of our PET-CT database to identify patients with multiple studies (i.e. 5 studies or more). (3) Retrieval and analysis of studies to quantify and score uptake in areas of interest and (4) tabulate findings for correlation with clinical and historical data.

We propose using descriptive statistics to describe our findings, and multiple regression methods to correlate findings with clinical and demographic information.

SPONSOR'S MOST RECENT PUBLICATIONS RELEVANT TO THIS RESEARCH:
Pending publication (preprint available):
Liu Y, Ghesani NV and Zuckier LS. Physiology and Pathophysiology of Incidental Findings Detected on FDG-PET Scintigraphy. Seminars in Nuclear Medicine, accepted for publication. (preprint available):

IS THIS PROJECT SUPPORTED BY EXTRAMURAL FUNDS?
Yes ☐ or No ☒
(IF YES, PLEASE SUPPLY THE GRANTING AGENCY'S NAME)

THIS PROJECT IS: ☐ Clinical ☐ Laboratory ☐ Behavioral ☒ Other (radiographic)
Summer Student Research Program
Project Description

THIS PROJECT EMPLOYS RADIOISOTOPES: No – uses already obtained images

THIS PROJECT INVOLVES THE USE OF ANIMALS: ❌
- Pending ❌
- Approved ❌
- IACUC Protocol #

THIS PROJECT INVOLVES THE USE OF HUMAN SUBJECTS: ❌
- Pending ❌
- Approved ❌
- IRB Protocol #M

WHAT WILL THE STUDENT LEARN FROM THIS EXPERIENCE?
Student will learn basics of PET-CT imaging in oncology, including normal and post-therapeutic findings. He/She will also learn known physiology and mechanisms of FDG uptake. The student will develop technical expertise in processing PET-CT images on a workstation to derive quantitative and qualitative scoring, and will develop experience in retrospective analysis of data. Finally, the student will be involved in writing up the findings for presentation and publication.