Grant Number:

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Project Title: THE BIOLOGY OF LUNG CANCER-- FDG AND FLUOROTHYMIDINE PET

Abstract: 1 The objective of the proposed studies is to investigate quantitative [F- 18]fluorodeoxyglucose (FDG) Positron Emission Tomography (PET) as a measure of non-small cell lung cancer (NSCLC) aggressiveness in vivo (i.e. grading) and to make comparisons with patients' outcomes and with specimen-derived measures of cellular proliferation previously shown to predict poor outcome (S-phase fraction, Ki-67 index). We postulate that, in clinically resectable NSCLC patients, pre-operative FDG PET will show that tumors with higher FDG uptake: (a) will recur sooner after surgical resection than same stage tumors with low uptake; (b) are more likely to have mediastinal or distal metastatic disease than tumors of the same clinical stage but low uptake; (c) have higher S-phase fraction of Ki-67 scores in their resected specimen. 3 The specific aims of the proposal are: (1) Perform whole-body pre- operative FDG PET imaging and correlate FDG uptake in primary NSCLC with outcome. 4 FDG uptake will be quantified by the following methods that will be compared: Standardized Uptake Value (SUV) and SKM-FDGMR (FDG Metabolic Rate determined by a Simplified Kinetic Method). 5 (2) Perform whole-body pre-operative FDG PET imaging and correlate FDG uptake (quantified as SUV and SKM-FDGMR) in primary NSCLC with disease extent as demonstrated by PET and surgical staging. 6 (3) Correlate preoperative FDG uptake in primary NSCLC with markers of cellular proliferation measured from the resected specimen and previously shown to predict poor outcome. 7 Outcome will be measured by recurrence-free survival, time-to recurrence and survival. 8 In summary, by studying NSCLC patients pre-operatively, prior to any form of chemotherapy or radiotherapy, we will gain valuable information about the biology of lung cancer, the leading cause of cancer death in the United States. 9 By performing a biologic grading of resectable NSCLC with FDG PET, we will predict which patients will have a worse outcome. 10 This information will allow individualized therapy.

List the purpose behind each sentence in this project description.	9
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