CANCER PREVENTION & RESEARCH INSTITUTE OF TEXAS

Award ID:
RP160051

Project Title:
Improving contrast for antibody-based tumor detection using PET

Award Mechanism:
Individual Investigator

Principal Investigator:
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Entity:
Texas A&M University System Health Science Center

Lay Summary:

Non-invasive whole body imaging represents an approach for the detection and characterization of tumors without the need for surgical or biopsy procedures. Consequently, the development of new and improved imaging methods is an area of active investigation for both the identification of tumors and their monitoring during therapy. Proteins called antibodies recognize and specifically interact with target markers on tumors. These antibodies therefore have the potential to be used to detect and localize tumors using whole body imaging approaches such as positron emission tomography (PET). Due to its high sensitivity, PET is a method of choice for tumor imaging. PET involves the use of radiolabeled antibodies that are injected into the bloodstream. Although these antibodies bind to the tumor following injection, they also persist in the bloodstream for prolonged periods. This persistence results in ‘background haze’ throughout the body that can cloud the detection of the tumor, particularly for small tumors. The long-lived, radiolabeled imaging agent can also cause radiation damage to normal tissue. Thus, there is a pressing need to develop improved methods to reduce background signal levels.Our laboratory has developed antibody-based agents to reduce the levels of circulating, radiolabeled imaging antibodies in the body in a highly regulated fashion whilst still allowing the antibody to bind to the tumor. The current study is directed toward analyzing whether these clearing agents increase the image quality and reduce radiation damage to normal tissue when using radiolabeled antibodies during PET. Our proposed analyses involve a combination of approaches to define the conditions that result in high quality PET data. These experiments are expected to result in improved visualization of both primary and metastatic tumors, which has direct relevance to the early detection, characterization and monitoring of multiple cancer types.