

Competitive PSMA Binding Agents for Reduction of Non-target Organ Uptake of Radiolabeled PSMA Inhibitors for PSMA Positive Tumor Imaging and Radiopharmaceutical Therapy

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Technology description

Unmet Need

Prostate cancer is the second leading cause of cancer related death in American men and it is estimated that approximately 164,690 new cases will be diagnosed in 2018. Elevated prostate-specific membrane antigen (PSMA) serves as a biomarker for prostate cancer and as well as primary clear cell renal carcinoma (ccRCC). However, PSMA is also expressed in normal organs such as the kidney, lacrimal glands, and salivary glands. Radiopharmaceutical therapy (RPT) has been used to diagnose and treat prostate cancer with some success by targeting PSMA with radiolabeled tracers and inhibitors. Due to PSMA expression in these various healthy organs, RPT can cause undesirable non-target organ uptake of the radiotracer/inhibitor and off-target effects, including dry mouth and renal toxicity. Consequently, there is a need for a novel method to reduce the off-target impact of RPT but maintain high tumor uptake, to better diagnose and treat prostate cancer and ccRCC.

Technology Overview

Johns Hopkins researchers have developed a method of co-injecting a non-radiolabeled PSMA inhibitor that competes with the radiolabeled PSMA inhibitor during RPT. This combination reduced uptake of the radiotracer in the non-target organs and only led to a small reduction in tumor uptake in mice. Their competitive inhibitor used demonstrated high tumor and renal uptake, which will minimize renal retention of the radiolabeled tracer, allow for better detection of ccRCC, and reduce renal toxicity and dry mouth that are common side effects of RPT.

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