

PROSTATE CANCER

immunoPET for imaging disease progression in prostate cancer

Metastases, especially bone metastases, are a major cause of morbidity and mortality in patients with prostate cancer, but current detection methods are unsatisfactory. Now, researchers report that immunoPET with the anti-prostate stem cell antigen (PSCA) A11 minibody might be able to improve detection of prostate cancer metastasis.

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PSCA is highly expressed in most prostate cancers and prostate cancer bone metastases, and its expression has been shown to correlate with Gleason score, tumour invasion, metastasis, androgen independence and prognosis. In an earlier study, Knowles and colleagues showed that immunoPET with a ¹²⁴I-labelled

anti-PSCA A11 minibody (an antibody fragment with properties optimized for imaging) could be used for quantitative imaging of PSCA expression *in vivo*.

In their latest study, the researchers used a mouse xenograft model to compare use of ¹²⁴I-labelled anti-PSCA A11 minibody immunoPET to use of ¹⁸F-Fluoride PET bone scans (the current clinical standard of care) for detecting prostate cancer bone metastases. They found that ¹⁸F-Fluoride bone scans showed a great deal of nonspecific uptake and that it was difficult to quantitatively determine a positive signal due to tumour growth using this method. By contrast, the high specificity of the A11 minibody enabled highly sensitive imaging of bone tumours; this method showed improved sensitivity and specificity over ¹⁸F-Fluoride PET bone scans at all time points.

Knowles *et al.* also showed that anti-PSCA A11 minibody immunoPET was able to detect downregulation of PSCA in

response to androgen deprivation therapy *in vivo* and, therefore, might be useful in evaluating the clinical response to androgen deprivation.

“The A11 anti-PSCA minibody has shown the ability to specifically image PSCA expressing cells *in vivo* and has potential diagnostic utility in noninvasive imaging, staging, and risk stratification of prostate cancer,” say Knowles and colleagues. “In this work, the A11 minibody achieved higher sensitivity and specificity than ¹⁸F-Fluoride bone scans for detecting osteoblastic intratibial xenografts which may allow for earlier clinical metastasis detection and improved patient risk stratification.”

Rebecca Kelsey

Original article Knowles, S. M. *et al.* Applications of immunoPET: using ¹²⁴I-anti-PSCA A11 minibody for imaging disease progression and response to therapy in mouse xenograft models of prostate cancer. *Clin. Cancer Res.* doi:10.1158/1078-0432.CCR-14-1452