## The Impact of Urinary Excretion of $^{18}$F-Labeled Choline Analogs

**TO THE EDITOR:** We have read with interest the article of Schuster et al. (*1*) on the initial evaluation of an $^{18}$F-labeled amino acid transport tracer, anti-1-amino-3-$^{18}$F-fluorocyclobutyl-1-carboxylic acid (FACBC) in patients with prostate cancer. In this preliminary study on a small cohort of patients, FACBC appeared to have several favorable properties for the imaging of prostate cancer in the pelvic region, including avid uptake in primary tumors and metastases in lymph nodes and bone, relatively lower uptake in nonmalignant tissues of the prostate or lymph nodes, and low urinary excretion. The results showed a certain promise that the evaluation of amino acid transport function with this tracer may be useful in new and recurrent prostate cancer.

However, we would like to respond to the comments of the authors that imaging of prostate cancer with $^{18}$F-labeled choline (FCH) is disadvantaged because of its relatively higher urinary excretion pattern. The urinary excretion of FCH has been reported to be 4.9% ± 4.8% of the administered dose in female patients and 1.9% ± 1.6% in male patients within the first hour after injection (*2*). Because of the extremely rapid renal clearance of FCH, most of the urinary radioactivity generally arrives at the urinary bladder within the first 20 min. Although urinary activity has the potential to confound the imaging of prostate cancer, image acquisition protocols have been designed to minimize the impact of this potential problem. Dynamic imaging over the pelvic region for the first 10 min after injection allows clear delineation of tumor uptake that precedes the appearance of radioactivity in the ureters and bladder (*3,4*). Consequently, it is possible to retrospectively exclude frames that show significant urinary interference. Furthermore, because there is rapid circulatory and urinary clearance of tracer but little washout from malignant tumors, voiding followed by delayed scanning with or without gentle hydration can also lead to satisfactory prostate images with high tumor-to-background contrast (*5*). The dynamic imaging information is useful not only for exclusion of urinary radioactivity but also for understanding the relationship of early FCH uptake, indicative of tracer delivery (perfusion) and choline transport, and of later tissue retention that is dependent on intracellular metabolism. In this regard, Schuster et al. (*1*) also found dynamic imaging to provide important information on FACBC kinetics: The amino acid analog was found to be transported but not metabolically trapped. Thus, the relative advantage of the lower urinary excretion of FACBC diminishes as the tracer washes out of malignant regions. The use of FACBC for whole-body imaging may require short image acquisition protocols, which may limit detection sensitivity for tumors. It will be of high interest to understand how rates of amino acid transport in prostate cancer, as seen with FACBC, relate to rates of choline transport and choline kinase activity, as seen with positron-labeled choline analogs.

### REFERENCES


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