Overlooked Contributions on Sodium Iodide Symporter

TO THE EDITOR: We are delighted to see interest in the sodium iodide symporter (NIS) growing in the nuclear medicine community, as reflected in the recent continuing education article authored by Chung (*1*). Nonetheless, we were disappointed that some of our own contributions to the field were overlooked. Specifically, we cite our abstract, published in *The Journal of Nuclear Medicine* in 2001 (*2*), which was the first to convincingly demonstrate that perrhenate, pertechnetate, and iodide show remarkably similar biodistribution in NIS-expressing and -nonexpressing normal tissues in mice. Furthermore, our subsequent article, published last year (*3*), not only contained dosimetry calculations as Chung states but was, in fact, the first to give a detailed rationale for using rhenium isotopes for treatment of NIS-expressing tumors. Tumor uptake was demonstrated in the absence of organification by the tumor, which proved the principle of this concept in an animal model of breast cancer.

As the role of a continuing education article (*1*) is to educate the broad readership of the *Journal*, we believe it especially important to present a balanced and thorough record of all investigators' contributions to date.

REFERENCES

1. Chung J-K. Sodium iodide symporter: its role in nuclear medicine. *J Nucl Med.* 2002;43:1188–1200.
2. Zuckier LS, Dadachova E, Li Y, Dohan O, Carrasco N. Comparative biodistribution of perrhenate, pertechnetate and iodide in NIS-expressing and non-expressing tissues of mice [abstract]. *J Nucl Med.* 2001;42(suppl):325P.
3. Dadachova E, Bouzahzah B, Zuckier LS, Pestell RG. Rhenium-188 as an alternative to iodine-131 for treatment of breast tumors expressing the sodium/iodide symporter (NIS). *Nucl Med Biol.* 2002;29:13–18.

Ekaterina Dadachova, PhD
Lionel S. Zuckier, MD
Albert Einstein College of Medicine
Bronx, New York

Mean Transit Time and Functional Image in Asialoglycoprotein Receptor Scintigraphy

TO THE EDITOR: I read with interest the article of Ohno et al. (*1*), and I was rather surprised to see the methodology used for the calculation of mean transit time (MTT). The area-over-height principle for the calculation of MTT is valid for a retention function. The mirror of the wash-in curve of ^{99m}Tc-galactosyl–human serum albumin (GSA) is not a retention function; the parameter (Δ over the peak value of the count) calculated by the authors does not, therefore, correspond to MTT. The authors used as a reference an article on dynamic ^{133}Xe ventilation scintigraphy (*2*). The pulmonary washout curve of ^{133}Xe can be assimilated to the retention function of a single-compartment model. The pulmonary wash-in curve during continuous and constant administration of ^{133}Xe can also be applied for the calculation of MTT using the same principle. It is, however, obvious that after an intravenous administration, the kinetics of ^{99m}Tc-GSA in the liver are different from those of ^{133}Xe in the lung during constant continuous administration of the tracer or during washout. The area over peak activity calculated by the authors systematically underestimates MTT. The underestimation is also highly variable depending on the shape of the plasma curve, the extraction rate of the liver, and the shape of the liver retention function.

REFERENCES

1. Ohno Y, Ishida H, Hayashi A, Kamagata S, Hirobe S, Ishii K. The mean transit time and functional image in asialoglycoprotein receptor scintigraphy: a novel modality for evaluating the regional dynamic function of hepatocytes. *J Nucl Med.* 2002;43:1611–1615.
2. Suga K, Nishigauchi K, Kume N, et al. Dynamic pulmonary SPECT of xenon-133 gas washout. *J Nucl Med.* 1996;37:807–814.

Hamphrey R. Ham, MD
Universitair Ziekenhuis Gent
Ghent, Belgium

Underestimation of Absorbed Dose to Kidney

TO THE EDITOR: With interest we read the dosimetric analysis of radioimmunotherapy using ^{90}Y-labeled ibritumomab by Wiseman et al. (*1*). We were surprised by the very low absorbed kidney dose. Because there is no actual targeting of the kidney and because the kidney dose can be attributed to activity in the blood; activity in the urine in the tubuli, calices, and pelvis; and radiation by adjacent organs such as the liver, it is curious that the kidney dose is so much lower than that of other organs and even lower than the dose to the urinary bladder wall. Our own radioimmunotherapy data and other studies using radiolabeled monoclonal antibodies for nonmyeloablative radioimmunotherapy report kidney doses of several grays (*2–4*), whereas the study of Wiseman et al. suggests that kidney doses do not exceed 0.76 Gy (*1*).

A possible explanation for this observation may be that the region of interest (ROI) for the kidneys was drawn around the right kidney. Because there is significant uptake in the liver, most counts in this kidney ROI can be attributed to the liver. Situating a background region next to the kidney, over the liver, would result in subtraction of background (mainly consisting of liver counts) from kidney (mainly consisting of liver counts), resulting in low numbers or even in the extremely unlikely kidney dose of 0.0003 Gy that was reported in the article.

To prevent underestimation of kidney doses, we usually draw ROIs around the left kidney, representing both kidneys, since no other organs (not even the spleen in most lymphoma patients) project over this kidney.

REFERENCES

1. Wiseman GA, Kornmehl E, Leigh B, et al. Radiation dosimetry results and safety correlations from ^{90}Y-ibritumomab tiuxetan radioimmunotherapy for relapsed or refractory non-Hodgkin's lymphoma: combined data from 4 clinical trials. *J Nucl Med.* 2003;44:465–474.
2. DeNardo GL, O'Donnell RT, Shen S, et al. Radiation dosimetry for ^{90}Y-2IT-BAD-Lym-1 extrapolated from pharmacokinetics using ^{111}In-2IT-BAD-Lym-1 in patients with non-Hodgkin's lymphoma. *J Nucl Med.* 2000;41:952–958.
3. Scheidhauer K, Wolf I, Baumgartl HJ, et al. Biodistribution and kinetics of ^{131}I-labelled anti-CD20 MAB IDEC-C2B8 (rituximab) in relapsed non-Hodgkin's lymphoma. *Eur J Nucl Med.* 2002;29:1276–1282.
4. O'Donnell RT, DeNardo SJ, Yuan A, et al. Radioimmunotherapy with ^{111}In/^{90}Y-2IT-BAD-m170 for metastatic prostate cancer. *Clin Cancer Res.* 2001;7:1561–1568.

Ernst J. Postema, MD
Wilhelmina C.A.M. Buijs, PhD
Otto C. Boerman, PhD
Wim J.G. Oyen, MD, PhD
University Medical Center Nijmegen
Nijmegen, The Netherlands