are affected, as is quantification in human studies that rely on lumped constants obtained using this assumption in nonprimate studies. For example, a value of 0.67 for the lumped constant has been widely used for estimation of myocardial glucose utilization in human studies, based on the study in dogs by Ratib et al. (*5*). That study made the assumption that glucose and FDG freely crossed the erythrocyte membrane, and myocardial glucose utilization was calculated by the Fick principle from the product of myocardial blood flow and the arteriovenous plasma glucose difference. However, because the canine erythrocyte glucose concentration is much lower than that in plasma and transport across the membrane is very slow (*2–4*), the correct value is given by the product of myocardial plasma flow and the arteriovenous plasma glucose difference, equivalent to the product of myocardial blood flow and the arteriovenous whole-blood glucose difference. As a result, myocardial glucose utilization will be overestimated by a factor of 1/(1 − Hct), with a resultant reciprocal underestimation of the lumped constant. Assuming a hematocrit of 50%, this would lead to a lumped constant of 0.67/0.5 or 1.34.

In summary, both animal model and age should be taken into account when making the assumption of rapid equilibration of glucose and FDG across the erythrocyte membrane, because this assumption is unlikely to be valid except in primates and in neonatal nonprimate mammals.

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REPLY: In our study (*1*), we showed that an ^{18}F-fluorodeoxyglucose (FDG) PET image-based time-activity curve can be used to estimate the sampled whole-blood time-activity curve. We used fitting of the macroparameter K as a reference with which to compare the image and sampled blood-derived time-activity curves. Although the area under the curve could also be used, the use of K allows for measurement of the relative impact of any given estimate of the blood time-activity curve on a macroparameter estimate. If the FDG does not equilibrate rapidly enough across the erythrocyte membrane in mice so that the sample time-activity curve does not represent the plasma time-activity curve, then the values for K we obtained would be inaccurate; however, the validity of the relative comparison of the image time-activity curve versus the sample time-activity curve would still stand.

From the PET images themselves, one can never isolate the plasma from the whole-blood activity. We have shown that the liver image time-activity curve can be used as an approximation to the sampled whole-blood time-activity curve. We agree that to rigorously validate using these blood time-activity curves for obtaining meaningful estimates of K, plasma and whole-blood concentrations should be compared experimentally for a given species, strain and age. Because of the limited blood volume of the mouse, this could not be done accurately in our study because several blood samples, therefore of small volume, were needed to observe the full duration of the blood time-activity curve. In our experience, a total of 285 μL blood can be withdrawn successfully from a C3H/HeN mouse and plasma can be separated from whole blood in samples as small as 60–70 μL. To properly compare whole-blood and plasma concentrations of FDG, one could obtain fewer samples (one to four) with larger volume (at least 60–70 μL) from a group of mice at different times.

We agree that there is a need for such experiments across all species for which FDG studies are used. We also agree that the lumped constant used in the FDG model may be affected by the hematocrit. Furthermore, we would add that the literature results cited for glucose transport into erythrocytes may not hold for FDG because of transport differences between the two substrates. The definitive solution is to measure the plasma and whole-blood time-activity curves for FDG and directly determine the differences, if any.

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Dopamine D_2 Receptor Brain Imaging in the Neonatal Period Using ^{123}I-IBZM SPECT

TO THE EDITOR: Kapucu et al. (*1*) recently reported the ability of dopamine D_2 receptor imaging to assess the severity of hypoxic-ischemic brain injury in young infants (7.8 ± 2.3 mo). As they emphasized, these results have to be verified by further studies earlier in the neonatal period.

After obtaining informed parental consent, we performed ^{123}I-iodobenzamide (IBZM) SPECT studies 1 wk after birth in seven neonates with hypoxic-ischemic events. Images were acquired with a Ceraspect gamma camera (Digital Scintigraphics Instruments, Waltham, MA) 1 h after an intravenous injection of 37 MBq ^{123}I-IBZM. The preliminary results confirmed that these studies can be performed without adverse events. The basal ganglia were fully detected in all neonates, showing the biochemical maturation of D_2 receptors. Relative uptake of ^{123}I-IBZM determined by calculating ratios between the mean uptake in the basal ganglia and that in the cerebellum was between 1.38 and 2.6, indicating some differences in the uptake of ^{123}I-IBZM, with lower uptake according to the severity of the hypoxic-ischemic injury as quantified by Sarnat and Sarnat score (*2*). Brain MRI performed on the same day to detect cortical and subcortical lesions was negative in all of the neonates.

These results are in agreement with the results reached by Zouakia et al. (*3*) in a previous ex vivo autoradiographic neonatal rat study, with a 40% decrease in striatal binding of D_2 receptors both on the side ipsilateral to the carotid ligation and on the