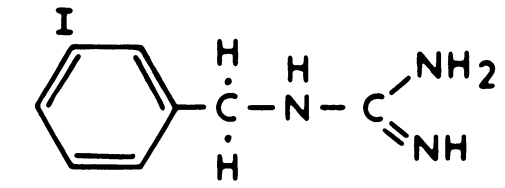
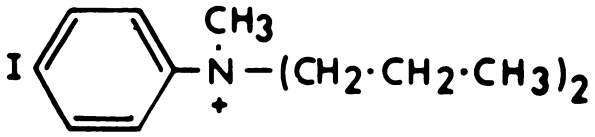
Problem with Mouse Neuroblastoma (C 1300) as a Model for Iodine-131 MIBG Uptake

TO THE EDITOR: The assumption, in utilizing an animal model, is that its behavior resembles that of the human counterpart. There are multiple reports in the literature that some human neuroblastomas accumulate the adrenal-localizing agent metaiodobenzylguanidine MIBG (*1*, *2*). We have found, however, that the mouse neuroblastoma C 1300 (National Cancer Institute) did not concentrate two radioiodonated compounds which localized in the adrenals.

Iodine-131 MIBG (Fig. 1) was supplied by Dr. William Beierwaltes of the University of Michigan. The compound *N,N*-dipropyl-4-(I-131)iodophenyl-*N*-methyl ammonium iodide, was prepared in two steps to produce a specific activity of 1,200 Ci/mmol. A precursor, *N,N*-dipropylaniline was iodinated and the resulting compound purified by high pressure liquid chromatography, followed by methylation. Using microcurie amounts, biologic distribution was followed in male mice after injection into a tail vein (CD-1, AJ, and AJ mice with neuroblastoma transplanted in the flank). The C 1300 neuroblastoma was in its thirtieth transplant and the flank tumors weighed 1–1.6 g at the time of study. Animals were killed at various times and the whole adrenals plus other tissues were removed, weighed, and counted for radioactivity in comparison with standards. Results (three mice per time interval) are shown as mean values in Table 1.



Meta-iodobenzylguanidine (MIBG)



N,N-dipropyl-4-iodophenyl-N-methylammonium (DIM)

FIGURE 1
Structural formulae of two compounds

TABLE 1
Results in Terms of Percent Injected Dose/g Tissue. Tissue Distribution of Two Radioiodinated Compounds

	^{131}I-DIM					
	(CD-1 mice)			AJ mice		Using ^{131}I-MIBG (AJ mice)
	5 min	1 hr	24 hr	1 hr	24 hr	24 hr
Blood	3.85	2.78	0.03	1.94	0.06	0.15
Adrenal	5.10	4.04	2.88	7.14	2.09	10.73
Neuroblastoma	—	—	—	0.30	0.05	0.26

These two compounds, which concentrate in the mouse adrenal gland, did not accumulate in the mouse C 1300 neuroblastoma. This raises concern about the biochemical similarity of the mouse neuroblastoma to the human tumor, since at least a portion of human tumors concentrate metaiodobenzylguanidine. Still unexplained are reasons for the heterogeneity of uptake by human neuroblastomas (whether dependent upon a characteristic of the tumor or the stage of development). In addition, since the mouse tumor was in its thirtieth transplant, changing affinity with the passage of time must be considered.

ACKNOWLEDGMENT

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References

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Pulmonary Sequestration or Tumor on Radionuclide Angiography?

TO THE EDITOR: We were intrigued by the case report, "Radionuclide Angiography in Pulmonary Sequestration" by Kobayashi et al. (*1*). They demonstrated the systemic arterial blood supply to the left lower lung lesion in a 7-yr-old male and concluded that it was a pulmonary sequestration, though it was suspected to be a mediastinal tumor radiographically. We wish to caution that the systemic blood supply to a pulmonary lesion does not necessarily indicate pulmonary sequestration, but also raises the possibility of a tumor. The following case report validates this statement.

A 75-yr-old woman presented with abrupt onset of right-sided chest pain. Physical examination showed decreased breath sounds in the right lower lung. Chest x-rays revealed a mass in right lower lung field (Fig. 1). CT scan duplicated the same finding but upper cuts of liver suggested hepatic involve-