REPLY

Three questions, other than our simplicity, have been raised concerning the method reported for labeling fibrinogen with ^{99m}Tc. Are other proteins labeled? Is the fibrinogen irreversibly denatured? Will the labeled material work?

Other proteins—chiefly albumin, as determined by electrophoresis—are labeled when a glycine-extracted protein rather than pure fibrinogen is used as a starting mixture. This constitutes approximately 10% of the radioactivity, as determined by zone counting of the electrophoretic cellulose acetate plate. The fraction rises to 15%, incorporating any residual free pertechnetate, when plasma, as we recommend, is used as a buffer for the freshly labeled solution, since protein tagging continues to take place.

Yes, part of the fibrinogen is irreversibly denatured. This is evidenced by (A) the formation of precipitates, (B) the short initial blood-clearance half-time of 150 min in the dog (versus 5.7 hr for ^{125}I-labeled fibrinogen), and (C) accumulation in the liver of a large portion of the dose in rats (more than five times the amount of ^{125}I-labeled fibrinogen), dogs, and man. This is probably related to the low pH of the labeling circumstances.

The crucial question, "Does it work?", may be answered by examining the pertinent property of fibrinogen—participation in clot formation. Approximately 25% of the labeled substance clots, so our answer is a qualified yes. An initial small trial labeling of a glycine-extracted autologous fibrinogen mixture (from informed consenting patients) suggests that after 18 hr activity does accumulate in areas of active clotting in the legs and in areas of active lower-extremity thrombophlebitis without demonstrable clotting, but not in areas of old clotting. This occurs in spite of denaturation and accumulation of the tagged protein in the liver.

Our purpose in disseminating information concerning an electrolytic means of labeling fibrinogen with ^{99m}Tc is to encourage those with facilities for extensive in vitro and in vivo quality control to evaluate the method rather than to ignore it, thinking that it will not work. It will work and it is simple, although it still may not be the best way to accomplish the labeling.

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COINCIDENCE AND NONCOINCIDENCE COUNTING

Having read the paper "Coincidence and Noncoincidence Counting (^{81}Rb and ^{43}K): A Comparative Study" by Ikeda, Duken, Tillmanns, and Bing (*J Nucl Med* 16: 658–661, 1975), I wish to make the following comments.

The authors did not state what window was used for the ^{43}K experiments. If a wide window (>250 keV) were used to encompass both pairs of ^{43}K peaks, some resolution would be lost due to this technique alone. Moreover, they do not state the distance at which the phantom or excised hearts were "scanned" with their 2-cm single-hole collimator. Naturally, the farther the target from the collimator face, the greater the FWHM. In this instance, FWHM would certainly be more than 2 cm. Using this coarse collimation, they proceed to the observation that "with these results in mind, it is difficult to see how, using noncoincidence counting in the beating heart in situ, any 'cold spots' can be detected using either ^{43}K or ^{81}Rb." If their observations were correct, then it would really apply to practically all nuclear medicine imaging techniques.

They have provided additional evidence that coincidence counting produces better resolution, but unfortunately positron emitters are not available for all nuclear medicine imaging procedures. Fortunately, equipment with considerable capability can be constructed or purchased. A collimator has been specially constructed for ^{86}Rb (1.08 MeV) and ^{42}K (1.52 MeV) (*1*). At its focal distance, it can resolve a 2.2-cm-diam hole in filter paper when the phantom was soaked in ^{86}Rb and counting was noncoincidence (*2*). This phantom was comparable to that of Ikeda et al. Those who are successfully securing myocardial images from scanning would make a list too long for any letter. They must be doing something correctly.

The authors suggest that myocardial scanning should be done while uptake by the heart is constant, but this period is very short after a bolus intravenous injection. A number of years ago, Love proposed the continuously decreasing intravenous infusion as a means of prolonging this period for serial scans (*3*). Work in this area has continued (*4,5*).

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