 Iron must be bound to transferrin to be utilized for hemoglobin synthesis. However it is difficult to bind radioiron to the patient's own plasma having low unsaturated iron-binding capacity (UIBC), and the use of high UIBC plasma of the other person may be a cause of false positive. If radioiron is injected without binding to transferrin, radioiron is cleared immediately from the circulation by liver uptake. Consequently, radioiron counts in plasma are lowered, radioiron dilution rate is greater and plasma volume may be overestimated. This may result in the overestimation of plasma iron turnover rate and red cell radioiron utilization (RCU). Furthermore, the radioiron taken up by the liver can hardly be released, and the rate of effective erythropoiesis may be underestimated from lowered RCU. To avoid the above described problem, a method for radioiron binding to patient's own plasma was devised. Blood is acidified by citric acid and plasma iron is detached from transferrin, and eliminated by absorbing it with ion exchange resin. Thereafter, radioiron is bound to transferrin by adding sodium bicarbonate solution. The radioiron bound plasma is injected through a millipore filter. Plasma iron elimination and radioiron binding is so effective that only a small amount of blood is needed. The procedure is simple, easy to perform and can be used clinically.

The in vitro and in vivo behaviors of To-99m fibrinogen (To-99m fb), both its incorporation into thrombus and possible gamma imaging of deep-vein thrombus in rats were investigated, in order to assess the availability of To-99m fb to clinical use. To-99m fb was retained sufficiently physico-chemical and biological properties, i.e., labeling percentage, To-99m bound to protein, clottability. To evaluate the effects of incorporation time and thrombus age, a thrombus was induced by technique of ligation of the left femoral vein and 5 min-interval stasis in rats. High ratios of both thrombus/control activity (per mg) and thrombus/blood activity (per mg) were obtained in thrombus at 30 minutes to 3 days after thrombus induction. For positive thrombus imaging, suitable ratio of thrombus/blood activity was around 4 or over, from 4 to 24 hours injection of To-99m fb. Positive hot spots in all cases of thrombus age at 30 minutes and 3 days were detected, 2 of 6 in 7-days thrombus, and none in 10-days thrombus. Heparin with doses of 1000 IU decreased significantly both ratios of thrombus/control and thrombus/blood activity in 1-day thrombus. Thus, To-99m fb may be of clinical use as a thrombus-imaging agent in active thrombosis.