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In vitro properties and *in vivo* behavior of technetium-99m labeled fibrinogens

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Fibrinogen was labeled with Tc-99m by two methods and the *in vitro* stability and *in vivo* behavior in mice were studied. The Tc-99m labeling was performed by mixing an unreduced fibrinogen (UnFib) or a reduced fibrinogen (ReFib) with Tc-99m pertechnetate in the presence of stannous chloride. In both of them, chelation with Tc-99m resulted in a single radiochemical product. For the *in vitro* stability studies, Tc-99m labeled fibrinogen (Tc-99m UnFib) was prepared with UnFib, and transchelation with cysteine solution was easy to produce compared to Tc-99m labeled fibrinogen (Tc-99m ReFib) prepared with ReFib. The radioactivity bound to clottable protein for Tc-99m UnFib and Tc-99m ReFib was about 70% and about 69%, respectively. The *in vivo* behavior of these labeled fibrinogens was studied, and their efficiencies for imaging an abscess and Ehrlich tumor in mice were determined with a gamma camera. Technetium-99m UnFib underwent a rapid partial exchange of the Tc-99m with compounds of the blood buffer system *in vivo*, resulting in early urinary excretion. On the other hand, the fraction of Tc-99m ReFib that remained intact *in vivo* was biologically active and would be incorporated into the abscess and tumor. The uptake in the abscess increased slightly over time with Tc-99m ReFib, but the abscess to blood and abscess to muscle ratios were 0.09 and 2.6 at 5 hr, respectively. Clearly delineated images of the abscess were obtained beginning at about 5 hr after injection. The tumor to blood and tumor to muscle ratios were 0.05 and 1.4 at 5 hr, respectively. The Ehrlich tumor image in mice was slightly visible at 10 hr. The short half-life of Tc-99m was inappropriate for fibrinogen with a low pharmacokinetic value, because it was necessary for imaging of the abscess and tumor to take a long time.

Key words: technetium-99m, fibrinogen, abscess, fibrin