

## Tumor scintigraphy by the method for subtracting the initial image with technetium-99m labeled antibody

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The method for subtracting the initial image from the localization image was evaluated for radioimmunosintigraphy of tumors with technetium-99m (Tc-99m) labeled antibodies. Monoclonal antibodies were parental mouse and mouse-human chimeric antibodies to carcinoembryonic antigen (CEA), designated F11-39 and ChF11-39, respectively, both of which have been found to discriminate CEA in tumor tissues from the CEA-related antigens. After reduction of the intrinsic disulfide bonds, these antibodies were labeled with Tc-99m. *In vivo* studies were performed on athymic nude mice bearing the human CEA-producing gastric carcinoma xenografts. Though biodistribution results showed selective and progressive accumulation of Tc-99m labeled antibodies at the tumor site, high radioactivity in blood was inappropriate for scintigraphic visualization of the tumors within a few hours. We examined the subtraction of the initial Tc-99m image from the Tc-99m localization image after a few hours. Subtracted images of the same count reflected the *in vivo* behavior of the Tc-99m radioactivity. The subtracted scintigrams revealed excellent tumor images with no significant extrarenal background. Visualization of the tumor site was dependent on antigen-specific binding and nonspecific exudation. These results demonstrate that a method of subtraction of the initial image may serve as a potentially useful diagnostic method for an abnormal site for agents with a low pharmacokinetic value.

**Key words:** technetium-99m, subtraction, monoclonal antibody, tumor imaging, radioimmunosintigraphy