In vivo radiopharmaceutical excitation fluorescence imaging

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In this study, experiments were designed and conducted to investigate the feasibility of radiopharmaceutical excitation fluorescence imaging for *in vivo* applications. Firstly, the subcutaneous tumor model was established by injecting the 6×10^6 cells/ml Bcap-37 cell suspension into the right upper flanks of the Balb/c nude mice. Secondly, the Eu_2O_3 solution was injected into the tumor tissues (Eu_2O_3 mass: 6×10^{-5}g). Ten h later, the nude mouse was injected with ^{18}F-FDG with the activity of 800 μCi via the tail vein.

Forty min later, the mouse was used for excited fluorescence imaging. The control mouse was injected with ^{18}F-FDG (800 μCi) only via the tail vein and received Cerenkov luminescence imaging. The binning value was 4, integration time was 5 min and aperture number f_{num}=1. Next, the two mice were used for fluorescence imaging. The excitation wavelength was 535 nm and the emission wavelength was 620 nm. Figure 1(a) and (b) shows the photographs and excited fluorescent images of the Bcap-37 cells' xenograft tumor mouse models. The left mouse was the control group, and the right mouse was the experimental group. The luminescent signal of the tumor tissue was much stronger after tumor injection with Eu_2O_3. Figure 1(c) and (d) show the photographs and fluorescent images of the same two mice. Figures showed that the background signal was very strong and the tumor was not detected. Experimental results showed that the novel technique better detected the location of the tumor, and had a higher signal to noise ratio.

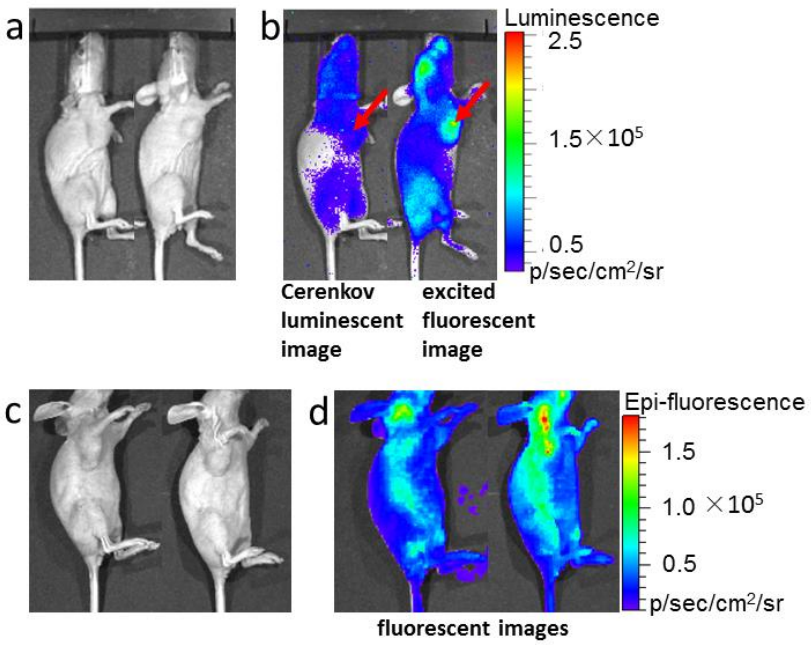

Figure 1

(a) shows the photographs of the Bcap-37 cells' xenograft tumor mouse models. (b) has the Cerenkov luminescent and excited fluorescent images of the two nude mice. (c) and (d) show the photographs and fluorescent images of the same two mice.