

Collimated Compton Camera

Tech ID: 34504 / UC Case 2024-026-0

VALUE PROPOSITION

The ability to evaluate and monitor cancer radionuclide therapies by direct, non-invasive imaging of radiopharmaceuticals in individual patients, known as theranostics, has shown great promise in the clinic with radionuclides like ^{177}Lu . However, the performance of current Single Photon Emission Computed Tomography (SPECT) in terms of image quality and acquisition times is sub-par with respect to the standard imaging of pure gamma-ray emitters radiotracers, such as $^{99\text{m}}\text{Tc}$. This is mainly due to the fact that collimators are not efficient at medium to high gamma-ray energies. Even if collimators for high-energy range exist, their sensitivity and image quality are very poor due to, among other reasons, reduced hole size and septal penetration. Imaging of these novel radionuclides requires novel techniques.

TECHNOLOGY DESCRIPTION

UCSF investigators have developed a Collimated Compton Camera, with the main use for single photon emission computed tomography (SPECT), but it can have other potential general uses where imaging of gamma-ray radionuclides is useful. Unlike the current SPECT scanners, this technology provides: 1) broad energy range gamma-ray imaging with a single device and configuration, 2) simultaneous imaging of different gamma-ray emitters in the same imaging session, 3) better sensitivity and imaging quality than current SPECT scanners at medium to high energies.

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OTHER INFORMATION

KEYWORDS

single photon emission
computed tomography,
imaging, camera, radiology,
radionuclide, gamma-ray

CATEGORIZED AS

- ▶ **Biotechnology**
- ▶ Health
- ▶ **Medical**
- ▶ Devices
- ▶ Disease: Cancer
- ▶ Imaging

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