

# High-Resolution Compact Positron Emission Tomography Camera

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## Technology description

### BACKGROUND

Positron emission tomography (PET) is an established imaging technique that is finding increasing use in clinics, particularly in oncology applications. Current PET scanners, however, are large and very expensive. Their large diameter compromises their performance for imaging specific regions such as the breast, head and neck, thyroid, and limbs. In addition, the image resolution of these scanners has been limited in practice to 8-10 mm, restricting sensitive detection to large tumors.

### INNOVATION

Scientists at the University of California have developed a high-resolution, flexible, compact positron emission tomography camera. This camera is comprised of two plate detectors that can remain stationary for projection images or rotate to form tomographic images.

## Application area

This compact camera is a useful clinical tool for high-quality PET imaging in specific regions of the body. It will allow physicians to use PET in a much broader scope, with imaging possible in the following areas:

Breast

Head and neck

Thyroid

Organs, such as the heart, liver, lungs, and pancreas

Limbs, including the hands and feet

Pediatrics- camera is good for children since the radiation dose can be dropped

Emergency rooms- camera can be brought to patients' bedsides, so they no longer need to be moved to the scanner

This same PET system can also provide scientists with a powerful tool for small animal studies. The non-invasive nature of the imaging technique will allow scientists to follow the same animal over an extended period of time without the need for sacrifice.

## Advantages

This compact system overcomes the limitations of conventional PET systems, offering a cost effective alternative with better imaging than whole-body PET, SPECT, or planar gamma-camera imaging.

Advantages include:

Improved image resolution (up to 2.5 mm, allowing visualization of smaller lesions)

Increased sensitivity (reducing scanning time and patient radiation dose)

Dramatic reduction in overall system cost relative to whole-body PET

Larger imaging area, more uniform resolution, and better count rate performance than conventional dedicated breast-imaging cameras

## Institution

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