

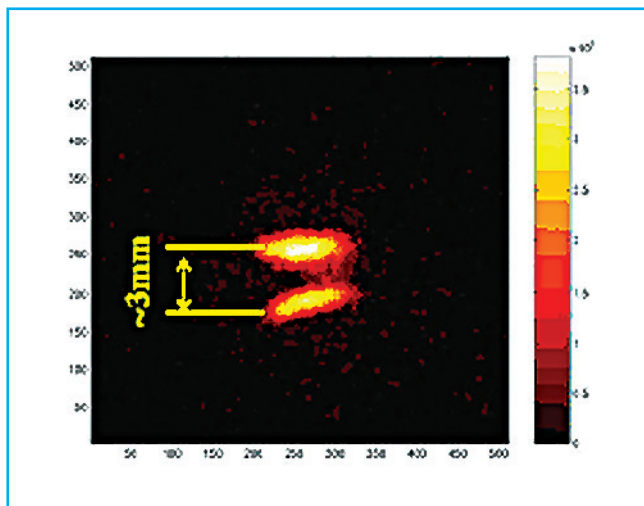
EMCCD based Single Photon Emission Microscope System for I-125 Imaging in Small Animals



Dr. Ling Jian Meng (October 2007)

There have been substantial efforts in trying to do microscopic imaging in small animals. Small animal imaging using I-125 labeled radiotracers is gaining popularity.

Dr Ling Meng from the department of Nuclear Engineering and Radiological Sciences, University of Michigan in conjunction with researchers from the V. A. Medical Center in Ann Arbor and in Van Andel Research Institute in Grand Rapid, Michigan have been using I-125 labeled antibodies, peptides and other compounds as screening agents in development of diagnostic and therapeutic radiopharmaceuticals for various types of cancers.



Reconstructed mouse thyroid image

I-125 decays via electron capture. The three highest photon emission probabilities for I-125 decay are:

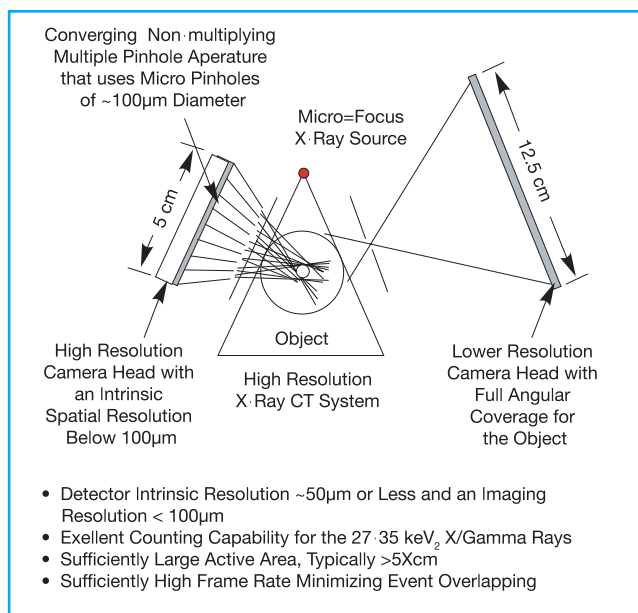
- 76% at 27.5 keV
- 13% at 31 keV
- 7% at 35 keV

I-125 has a half-life of 60.14 days. The combination of low energy and long half-life offers advantages for Single Photon Imaging Computed Tomography (SPECT) imaging:

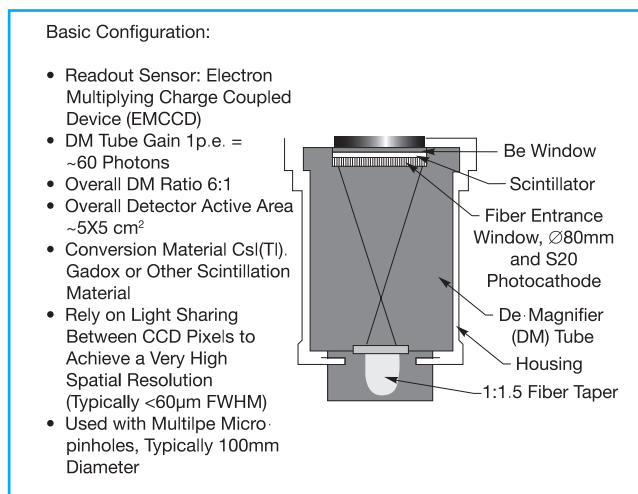
- Due to the low photon energy, it is possible to collimate and detect photons with a very high accuracy.
- It is possible to achieve an imaging spatial resolution that is down to <100 microns level.

Recently they have begun to produce next-generation SPECT technology based on use of Andor's fiber-optic EMCCD (DF-897-FB) technology for rapid, highly sensitive detection of these energetic photons.

Application Note



High Resolution SPECT System using fiberoptic EMCCD



High Resolution gamma EMCCD head

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