AbstractID: 9558 Title: A combined I-125 nuclear emission and transmission radiography system for co-registered imaging of mouse function and anatomy

The mouse has become an important research tool in genomic science, and imaging the mouse has become a valuable adjunct to genomic research. Although tomographic techniques such as high resolution PET and CT are extremely useful, there is also a need for the rapid assessment of mouse anatomy and function at very low radiation doses, with low cost and high throughput. A system was designed using a computed radiography (CR) imaging plate as the detector. A planar emission image (I-125) is acquired onto one side of a CR detector, and subsequent precise movement of the CR plate allows the acquisition of an x-ray radiographic image onto the other side of the same CR plate. Once the images are read-out, the two images are mechanically registered, allowing the functional I-125 emission data to be overlaid onto the anatomical x-ray image. Because the CR plate detectors and other required hardware are relatively inexpensive, many mice can be imaged simultaneously using redundant systems, resulting in excellent throughput for screening, the evaluation of gene expression or tumor activity. The overall design of the dual imaging system will be discussed, and the results of a prototype system currently in our laboratory will be presented.