

Detection resolution of small nodules in the lung of the rats using refraction imaging

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Purpose of this experiment is to estimate detection resolution of small nodule in the rat lung using refraction imaging. The detection resolution of small nodule conventional radiograph is 5mm. Subjects are early lung tumor rat model. This rats were injected leukemia cells through veins. Small nodules were made in 1 weeks after injection of leukemia cells. Sizes of nodules were distributed from a few ten micrometers to a few mm. X-rays with the energy of 25 keV were monochromatized. The beam size was 5 X 5mm. The sample and films were scanned synchronously.

Figure 1 shows refraction chestradiograph of small lung nodule model rats.

In this radiograph, very small lung nodules are visible. After imaging, hole lung of rats were taken out and sliced. Tumors in lung were checked pathologically.

Tumors of 1mm in size are clearly visible at least.

Figure 2 shows tumor in lung of rat. In conclusion, Synchrotron Radiation is a potentially useful technique, in

the observation and digestive tract, furthermore, it may be powerful tool in the detection of early lung cancer. In this experiment, using the early-lung cancer rat model, a tumor size of 0.1mm is clearly visible.



Figure 1. Chestradiograph of rat.
 Very small lung nodules are visible.



Figure 2 Pathologic imaging of rat