



Focal Points



Application Note FP-155

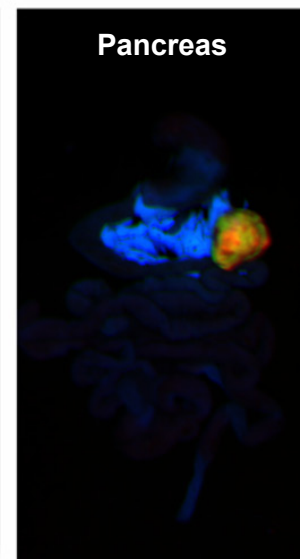
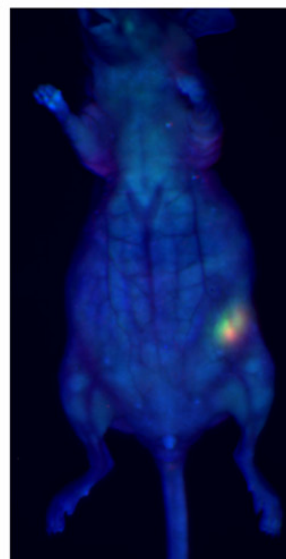
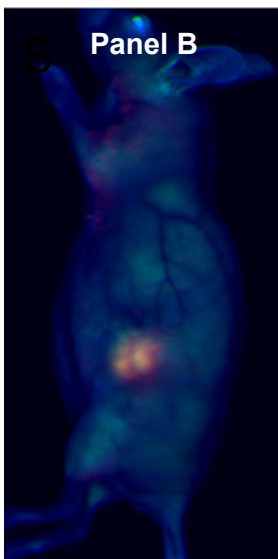
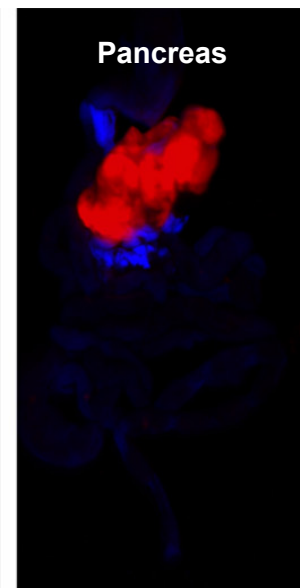
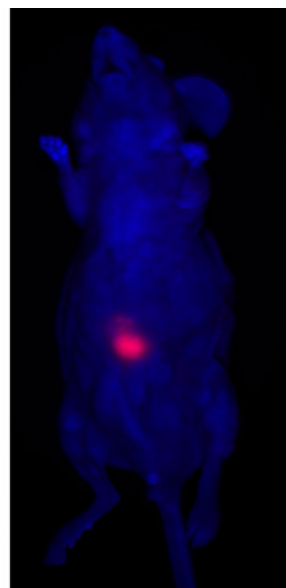
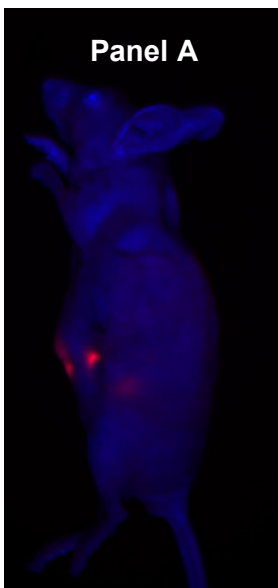
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Color Coded Fluorescent Imaging in Mice Using the iBox® Scientia™ Small Animal Imaging System

Fluorescent protein imaging permits rapid and simple tracking of primary and metastatic cancer development in nude mice. In the paper by Cao et al (2009), a new mouse test model, expressing cyan fluorescent protein (CFP) in most tissues, was developed to enable multicolor imaging of normal and tumor tissue.

Of the organs surveyed, the pancreas and reproductive organs showed the strongest blue fluorescence to use as background contrast to the red or green fluorescing tumor cells. For subsequent experiments using red fluorescent protein (RFP) and green fluorescent protein (GFP) labeled tumors, the tumors were readily tracked by multicolor imaging. XPA-1 human pancreatic tumor cells, expressing RFP alone or RFP in the cytoplasm/GFP in the nucleus, were orthotopically implanted in the pancreas and tracked over a period of several weeks.

The images to the right, taken with the iBox Scientia System, show week 6. **Panel A** shows red RFP expressing pancreatic cancer cells on the bright blue background of the whole animal and the isolated pancreas. **Panel B** shows the dual GFP (nucleus) and RFP (cytoplasm) expressing pancreatic



cancer cells.

The **iBox® Scientia Small Animal Imaging System** was configured with a CFP, GFP, and RFP filter set, **BioLite™ Multispectral Light Source** (UVP, LLC), BioChemi 500 camera (4.2MPX, Cooled to -18°C), and motorized lens set to f/1.2 with exposures of 10 msec to 30 min. The BioLite uses a fiber optic light source to supply bright, directed and filtered light excitation at various wavelengths including CFP, GFP and RFP visualization. The system can image from 400 to 900nm including common visible and NIR fluorescent tags. A warming station, with temperature controlled to 37°C, accommodates up to five mice. The darkroom has a height-adjustable motorized platform for placement of the warming station.

Separate images for each color were acquired with **VisionWorks®** LS image acquisition and analysis software (UVP, LLC). The compositing software tool allows combining separate images for viewing the fluorescent tumors.

References

1. Tran Cao, H.S.; Kimura, H.; Kaushal, S.; Snyder, C.S.; Reynoso, J.; Hoffman, R.M.; Bouvet, M. The cyan fluorescent protein (CFP) transgenic mouse as a model for imaging pancreatic exocrine cells. JOP 2009, 10, 152-156.
2. Tran Cao, H.S.; Reynoso, J.; Yang, M.; Kimura, H.; Kaushal, S.; Snyder, C.S.; Hoffman, R.M.; Bouvet, M. Development of the transgenic cyan fluorescent protein (CFP)-expressing nude mouse for "Technicolor" cancer imaging. J. Cell. Biochem. 2009, 107, 328-334.



iBox Scientia Small Animal Imaging System

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