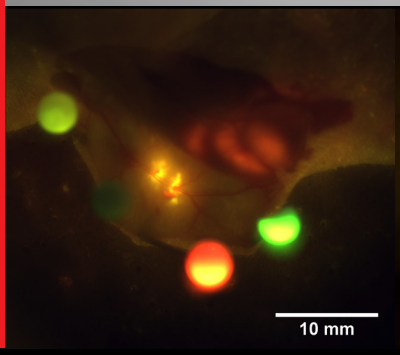
analytikjena
An Endress+Hauser Company

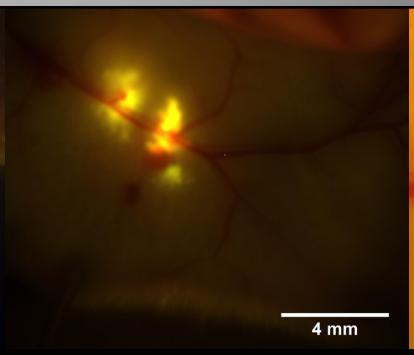
UVP iBox® Explorer$^{2}_{TM}$

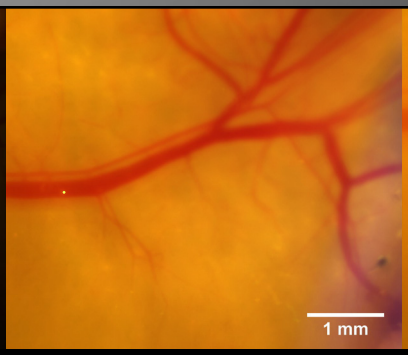
Closing in on the answers within

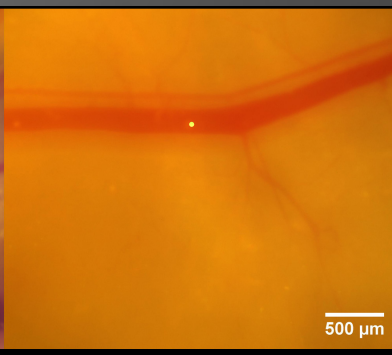
- Multiplex in vivo
- Cancer research
- Gene expression
- Nanomedicine
- Near IR
- Immunology
- Heart disease
- Alzheimer's
- Plant & Agriculture

Fluorescence Imaging Microscope





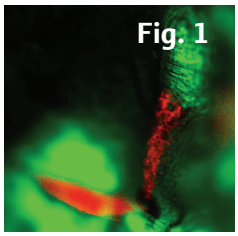


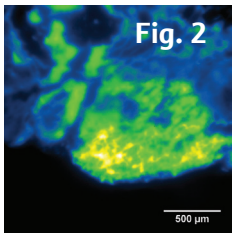


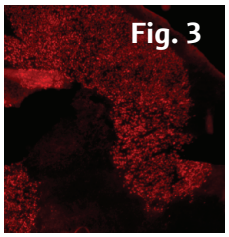
In Vivo imaging from whole organ to single cell.

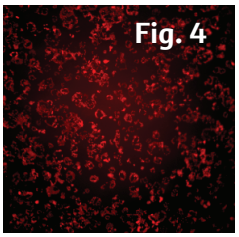
UVP iBox® Explorer^{2TM} is the only integrated system capable of visualizing from whole organs to individual cells in vivo. AJ's iBox Explorer enables researchers to quickly detect fluorescence markers in vivo. The optical configurations are parcentered and parfocal allowing seamless imaging from macro to micro magnification settings.

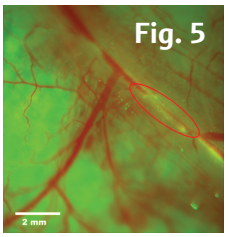
Some examples of applications follow. For other examples and full Application Notes on these topics, go to www.analytik-jena.us

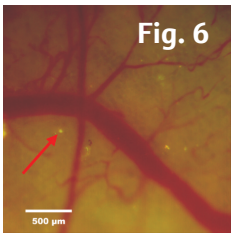












Fluorescent Cancer Cell Detection

Migration of fluorescent cancer cells within vasculature of a mouse. HT-1080 fluorescent cancer cells were injected into the epigastrica cranialis of a mouse. Immediately after injection the fluorescent signature around injection site identifies cells that have escaped into surrounding tissue. A magnified image highlights cancer cells migrating within the bloodstream.

Multiplex Dual Color Imaging

Human osteosarcoma cells at 50% confluence in RPMI media. The multiplexed image is a composite of GFP expressing nuclei and RFP expressing cytoplasm.

Tumor Cells in the Colon

Skin flap technique visualizing the MMT (breast cancer cell line) dual color tumor cells in the colon. GFP and RFP filters were used to isolate the green and red fluorescence.

Tumor Targeting of NIR

GFP-expressing tumor bearing CEA surface antigen. Human pancreatic cancer cell line with high levels of CEA surface antigen expressing the GFP reporter gene was implanted into the right flank of a mouse. After four weeks, a NIR dye was injected intravenously, conjugated to an anti-CEA polyclonal antibody. 18 hours after injection, the dye antibody conjugates were co-localized within the tumor.

Biodistribution Monitoring

Monitoring biodistribution of DyLight 755, a near infrared (NIR) dye, conjugated to anti CEA monoclonal antibody within the tissues of a nude mouse. Four hours after injection, the dye can be seen accumulating in the liver. Ex vivo analysis shows that the liver has the most intense NIR emission, suggesting the greatest accumulation of dye. Application Note FP-178.

Detecting a Mouse Pancreatic Cancer Cell Line

Mouse pancreatic tumor tissue sample imaged at two magnifications: 2.5x and 8.8x. A red fluorescent protein (RFP) filter was used to highlight the RFP-tagged cytoplasm to show the distinct morphologic characteristics of individual cells as well as the tissue microenvironment ex vivo. The cell line, XPA1 (Fig 3) shows a histological sample viewed at 2.5x magnification, excited with light funneled through the optical components. At high magnification (8.8x, Fig 4), more distinct detail can be seen, such as cell orientation, areas of high RFP concentration and cytoplasmic morphology. To read more about this research, see Application Note FP-169.

Constitutively Fluorescent CFP Mouse

Labeling of mouse thyroid tissue histology section with Alexa488 conjugated to anti-CEA antibody. Background fluorescent areas appear blue due to co-expression of cyan fluorescent protein (CFP) reporter with an intracellular protein. Areas of high CEA surface antigen expression readily bind to the Alexa488 conjugate and emit green fluorescence. Figure 2

Detection of Multiplex

NIR Dyes In Vivo View of a Qdot conjugated to anti-CD133 monoclonal antibody distribution within a surgically exposed abdomen. The image displays the presence of a GFP expressing tumor lesion within the liver and collection of conjugate in the abdominal organs. The image represents a three color multiplex channels. Application Note FP-173.

Intravital Imaging of a Mouse Ventral Skin-Flap

Real-time in vivo imaging of HT-1080 cancer cells at several levels of magnification. Figure 5 shows a multiplexed image of a skin flap at 2.5x magnification. The major vessel in the field corresponds to the epigastrica cranialis vein of a nude mouse. Clusters of dual-colored HT-1080 cells can be visualized moving through the vasculature in the right-most aspect of the field. Figure 6 shows an 8.8x magnification of a skin-flap. Migrated dual-colored HT-1080 cells (bright yellow) within a distal vessel have begun to extravasate. To read more about this research, see Application Note FP-171.

Co-Localization of NIR-tagged Antibody

Subcutaneous tumor implanted in a mouse. Qdot 800-CD133 antibody conjugate was injected into the vasculature of a hepatoma tumor-bearing mouse. High magnification of the tumor vascular shows co-localization of the Qdot conjugate in red within the GFP expressing tumor. Qdot800 signal can be seen within the perivascular region of the tumor vessel. Figure 1

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