MediLumine Vision without Sacrifice
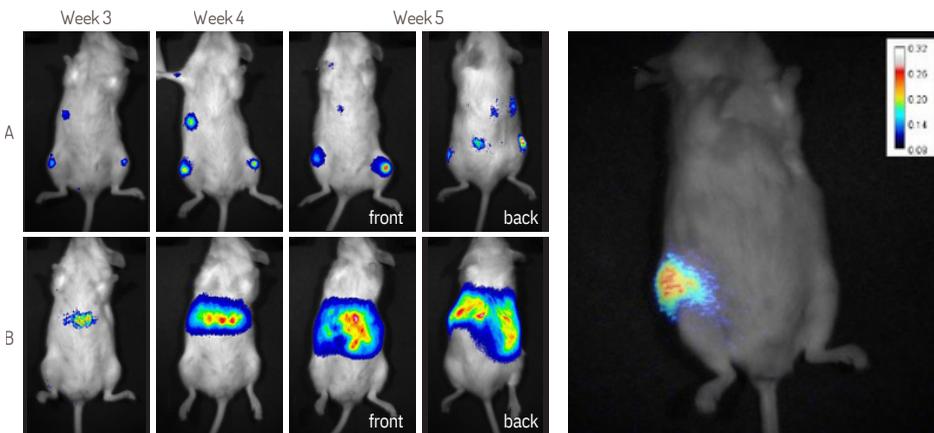
PRISM™ In Vivo Imaging System

The PRISM™ In Vivo Imaging system leverages advanced photon-counting technology to deliver a new standard of sensitivity in preclinical research.

As the only system in its class equipped with an EMCCD camera, it enables high-speed acquisitions of 20 images per second, allowing for true real-time imaging with single photon detection capacity and seamless video export. The is sensor capable of detecting single photons with a quantum efficiency exceeding 90% between 550 and 750 nm.

The system integrates 2D fluorescence through a dual-illumination setup from the top-left and top-right corners, utilizing collimating optics for uniform excitation. Beyond standard 2D captures, the PRISM provides unprecedented 3D imaging offering researchers superior depth estimation and precise localization of optical signals.

2D High-sensitivity in vivo imaging with 20 cm field of view, providing the throughput and precision necessary to image five mice simultaneously.

3D Bioluminescence and fluorescence Imaging for signal localization and depth estimation.

Monitoring progression of tumors with PRISM™ in vivo imaging system following IV injection of bioluminescent human neuroblastoma cell lines in NGS mice: N-91 tumors (top images) develop mainly in liver while IMR-32 tumors (bottom images) seed in bone marrow, liver and adrenal gland.

Image courtesy of Sabine Herblot PhD from laboratory of Michel Duval MD., CHU Saint Justine Research Center

Near infrared light from a bioluminescent tumor expressing luciferase with an average of 5 near infrared photons per pixel detected. It is the first time any group has been able to detect NIR light from a luciferase reporter following injection of Luciferin. A 832 ± 18 nm bandpass filter on camera was used for this imaging experiment.
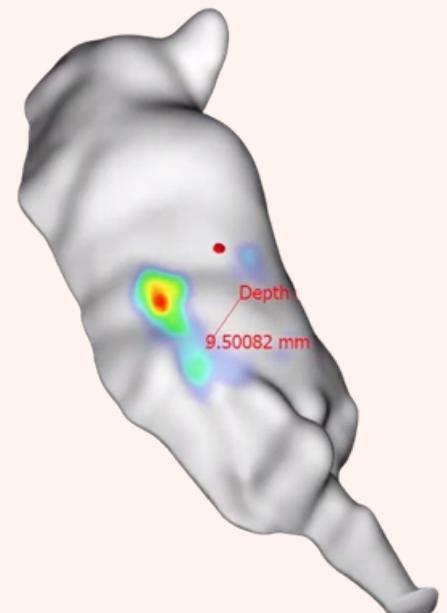
Laser Based Trans-Illumination Optional Add-On

The PRISM™ In Vivo Imaging System is built for maximum flexibility, offering an optional laser-based trans-illumination fluorescence add-on that utilizes 680 nm and 780 nm laser diodes. This dual-wavelength laser raster scanning, combined with an absorbance pre-scan, significantly reduces signal bleed and provides superior precision for deep-tissue imaging.

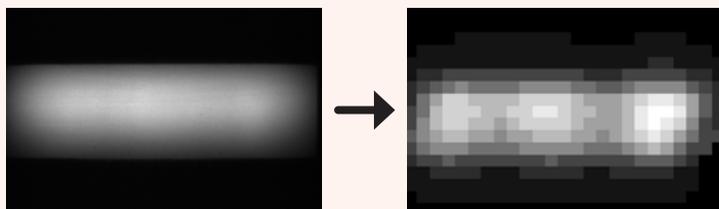## Unparalleled sensitivity with laser based fluorescence imaging

Biomimetic phantom for insertion of probe tubes at different depths. The phantom has a μs of 1.05 mm-1 and μa =0,012 mm -1 at 690 nm

Reflection   Transmission

100 nM

10 nM

1 nM
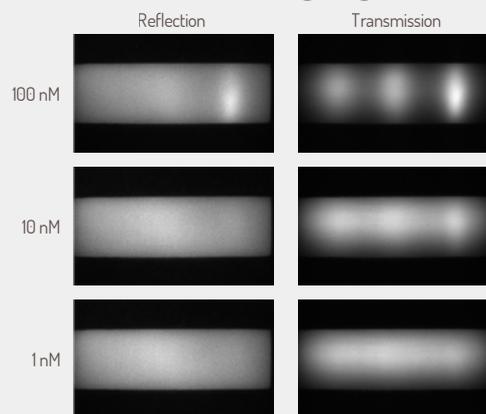
2D fluorescent view of tube with Cy5.5 dye at different concentrations and depths in phantom
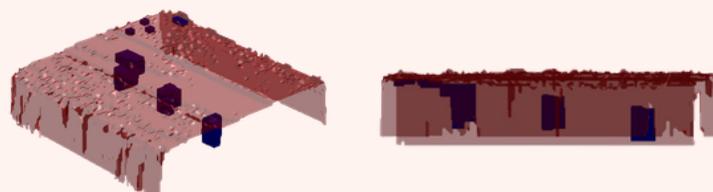
Transmission with 1 nM of Cy5.5

Sum of all images (for each laser position)   After Born normalization

3D view (transmission with 100nM of Cy 5.5)

System Specifications

- Real time bioluminescent imaging in photon counting mode (20 images/sec)
- Image acquisitions of 20 images per second to allow for real time imaging
- 3D Bioluminescence with galvanometer based profilometer
- Variable field of view : 4.2 cm, 5 cm, 10 cm, 15 cm, 20 cm (for five mice)
- Temperature control between 20 to 40 °C
- Sensitive bioluminescent detections within the auto-luminescent background (~1000-5000 ph/s/cm^2/sr)
- Excitation filters included in system: 440 nm 460 nm 480 nm 500 nm 520 nm 540 nm 560 nm 580 nm 600 nm 620 nm 640 nm 660 nm 680 nm 700 nm 720 nm 740 nm 760 nm 780 nm
- Emission filters included: 520 nm 570 nm 620 nm 670 nm 710 nm 790 nm 845 nm
- Includes PYRAMID analysis software with unlimited licenses
- Full Somni suite anesthesia system with active gas scavenging
- Five mouse bed with hyperbranching tech for active induction of anesthesia

Camera Specs

- 1024 x 1024 imaging pixels
- 13 μm pixel size
- Spectral range: 250-1100 nm
- Read noise: < 1 ē
- QE Max: > 95%

Optional Add-Ons

- Trans-illumination fluorescence with laser diodes at 680 nm and 780 nm
- Add-on lens for 10 mouse imaging (24 x 24 cm FOV)
- PRISM Viva mouse bed for ECG physiological monitoring and and temp control of five mice via bio-feedback system
- Ten mouse bed with hyperbranching tech for active induction of anesthesia
- Imalytics preclinical for 3D image analysis and signal localization