

## PRISM™ In Vivo Imaging System



MediLumine's PRISM in vivo imaging system utilizes photon counting for highly sensitive in vivo bioluminescence imaging. The system comes with the option of adding 2D fluorescence via dual illumination from top-left and top-right corners with collimating optics.

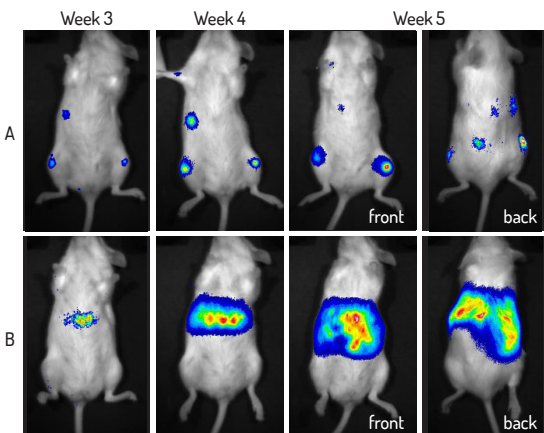
It is the only in vivo imaging system with an EMCCD camera enabling real time imaging with high speed acquisitions of 20 images per second and video export of optical images.

The highly customizable system boasts a variable field of view for one mouse, 3 mice or 5 mice and is capable of detecting single photons in a pixel with a quantum efficiency over 90% from wavelengths between 550 to 750 nm.

The PRISM in vivo imaging system also allows for unprecedented 3D imaging in bioluminescence and laser raster based fluorescence modes for localization and depth estimation of optical signals in vivo.

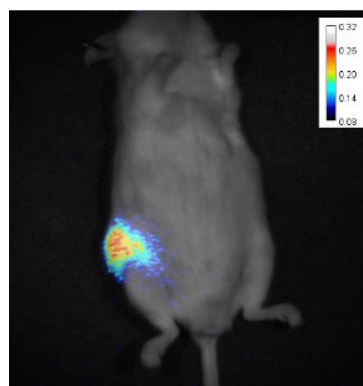
### 2D Sensitive BLI and FLI imaging with variable FOV for 1 mouse, 3 mice or 5 mice.

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

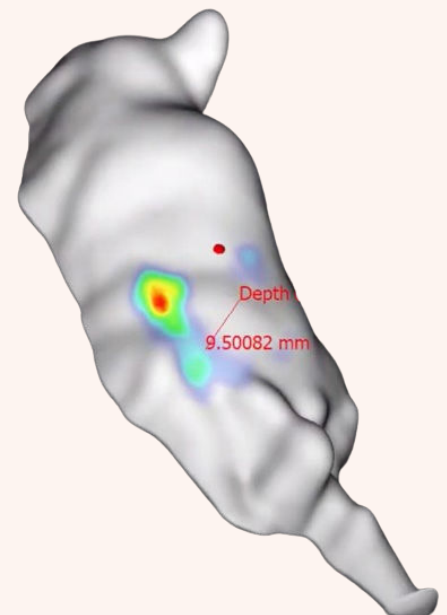


Monitoring progression of tumors with PRISM™ in vivo imaging system following IV injection of bioluminescent human neuroblastoma cell lines in NGS mice: N-91 tumors (top images) develop mainly in liver while IMR-32 tumors (bottom images) seed in bone marrow, liver and adrenal gland.

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.



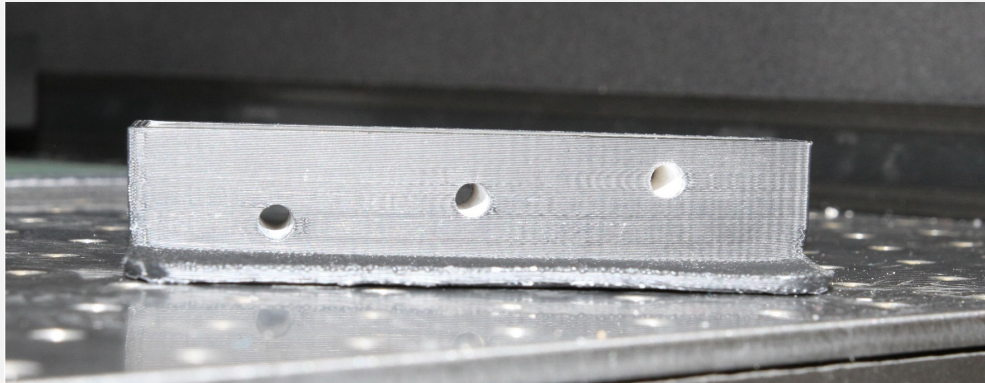


# Highly Customizable

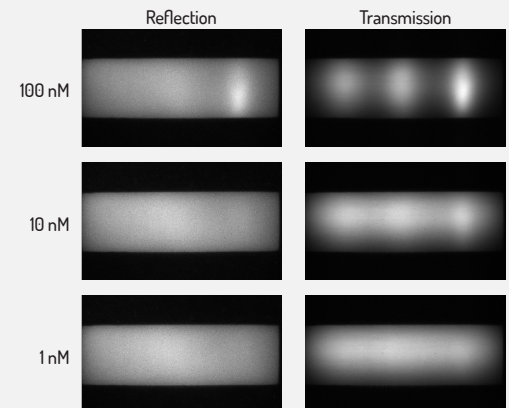
The PRISM in vivo imaging system is highly customizable allowing users to add options such as a fixed FOV, laser raster for fluorescence with absorbance pre-scan that minimizes bleeding of signal on sides of mouse, 3D bioluminescent imaging for signal localization, and an optional 24 cm FOV lens attachment.

All publications and documents related to PRISM can be accessed online at <https://medilumine.com/product/prism-in-vivo-imaging-system>

## Unparalleled sensitivity with laser based fluorescence imaging

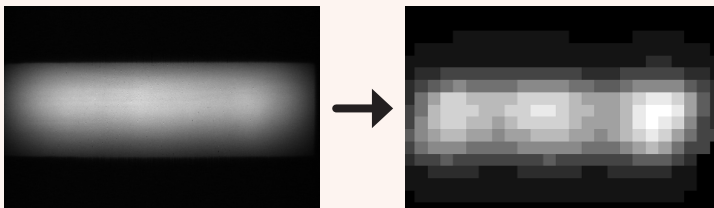


Biomimetic phantom for insertion of probe tubes at different depths. The phantom has a  $\mu_s$  of  $1.05 \text{ mm}^{-1}$  and  $\mu_a = 0.012 \text{ mm}^{-1}$  at 690 nm



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

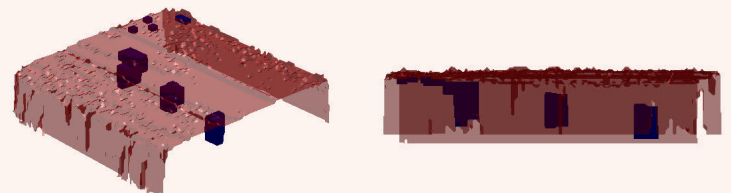
## Transmission with 1 nM of Cy5.5



Sum of all images (for each laser position)

After Born normalization

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



## Specifications

- 2D Bioluminescent and Fluorescent in vivo imaging
- Image acquisitions of 20 images per second to allow for real time imaging
- Prescan that automatically sets EM gain from 1 to 5000 during acquisition
- 1024 x 1024 imaging pixels
- Variable field of view : 5 x 5 cm (1 mouse), 12.5 x 12.5 cm (3 mice), 17 cm x 17 cm (5 mice)
- Temperature control between 20 to 40 °C to keep animal within physiological conditions
- Sensitive bioluminescent detections within the auto-luminescent background ( $\sim 1000\text{-}5000 \text{ ph/s/cm}^2\text{/sr}$ )
- Up to 18 excitation filters and 20 emission filters
- Dual illumination from top-left and top-right corners with collimating optics for 2D fluorescence imaging

- TE cooling down to -100 °C
- Pixel area:  $13 \mu\text{m} \times 13 \mu\text{m}$
- Spectral range: 250-1100 nm
- Read noise:  $< 1 \bar{e}$
- QE Max:  $> 95\%$

### Optional

- Fixed FOV : 17 x 17 cm or 13 x 13 cm.
- Add-on lens for 10 mouse imaging (24 x 24 cm FOV)
- 3D Bioluminescence with galvanometer based profilometer
- Laser raster based fluorescence with absorbance pre-scan to determine illumination power that minimizes signal bleeding on the side of the mouse