

IVIS | Lumina II

Quantitative Fluorescent and Bioluminescent Imaging

The IVIS Lumina II from Caliper Life Sciences provides an expandable, sensitive imaging system that is easy to use for both fluorescent and bioluminescent imaging *in vivo*. The system includes a highly sensitive CCD camera, light-tight imaging chamber and complete automation and analysis capabilities. As the leading optical imaging platform for *in vivo* analysis, IVIS systems include a range of practical accessories developed through experience in research laboratories worldwide.

In Vivo Molecular Imaging

Quantitative Flexible Expandable

An adjustable field of view from 5 – 12.5 cm and an optional 24cm lens allows imaging of up to 5 mice or 2 medium size rats. The Lumina II can also accommodate Petri dishes or micro-titer plates for in vitro imaging. The system includes premium animal handling features such as a heated stage, gas anesthesia connections and ECG monitoring.

High resolution, sharp cut-off filters are simply interchangeable to achieve the highest performance, sensitivity and spectral unmixing in fluorescence imaging.

Superior Imaging Results

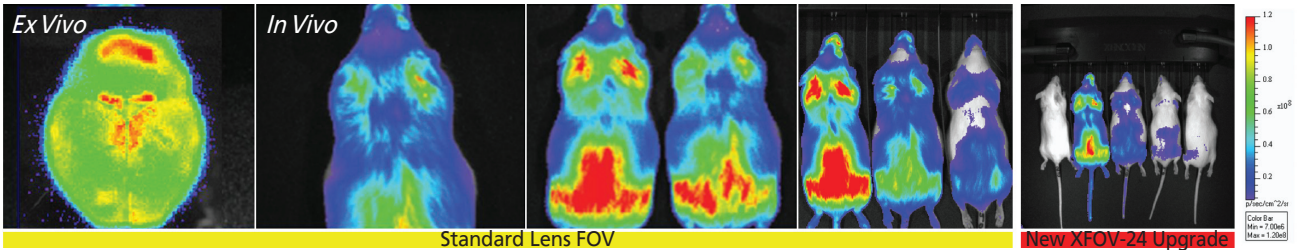
The IVIS Lumina II is capable of imaging both fluorescent and bioluminescent reporters. The system is equipped with up to 21 filter sets that can be used to image reporters that emit from green to near-infrared. Superior spectral unmixing can be achieved by Lumina II's optional high resolution short cut off filters. Absolute calibration affords you consistent and reproducible results independent of magnification, filter selection from one instrument to any another IVIS instrument within an organization or around the world. The Living Image software yields high-quality, reproducible, quantitative results incorporating instrument calibration, background subtraction and the image algorithms.

Customize the IVIS Lumina II with your own Filter Combinations

Fluorophores	Standard High Resolution Excitation Filter Set (Built-in)	Emission Filter Options
GFP, YFP and PKH26	430, 465, 500, 535, 570, 605, 640, 675, 710, 745	*500 Series 500, 520, 540, 560, 580, 600 and 620
Cy 5.5, DsRed, dTomato and XenoFluor 680		*600 Series 580, 600, 620, 640, 660, 680 and 700
Indocyanine Green and XenoFluor 750		*700 Series 720, 740, 760, 780, 800, 820, and 840
Multiple Fluorophores Spanning 500-900 nm Broad Imaging Solution		Standard Emission Filter Set 515-575, 575-650, 695-770, 810-875

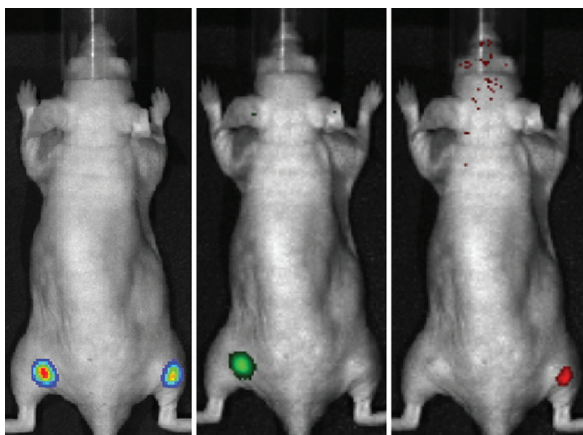
* Median wavelength band path 20nm on emission filters

Field of View



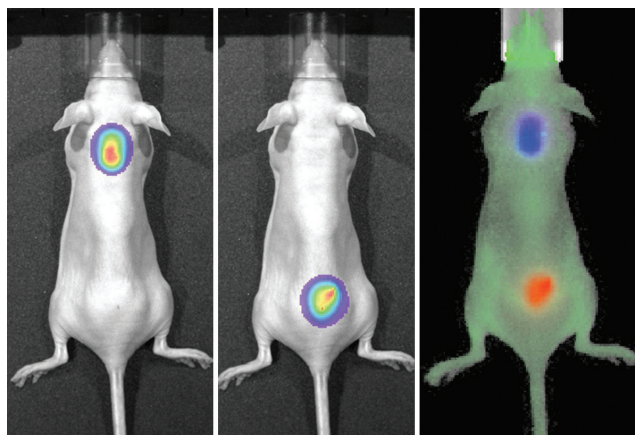
The IVIS Lumina II Imaging System provides 5 fields of view.

Imaging Results - Living Image Software with High Resolution Filters



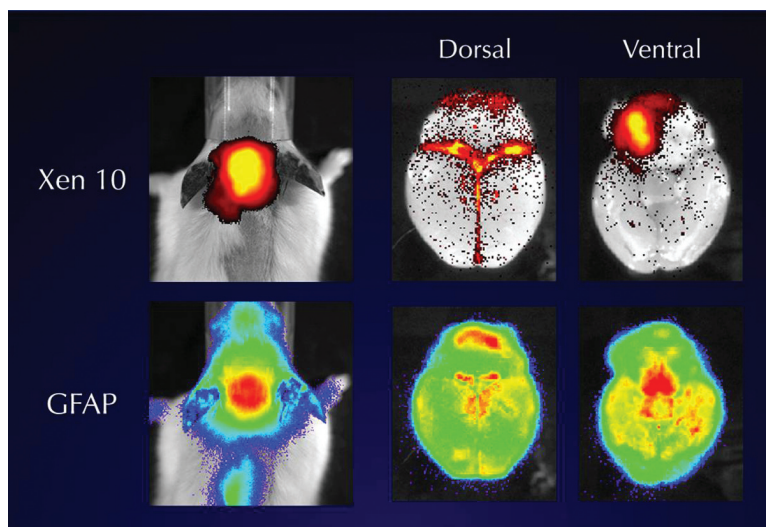
Triple Reporter Imaging

Thigh Infection with *Klebsiella pneumoniae* expressing luxCDABE with optimized GFP or RFP. Approximately 10^8 CFU per thigh. *Courtesy of the University of Glasgow.*



Spectral Unmixing of Xenofluor 680/750

Subcutaneous injections of 1014 molecules of Xenofluor 680 (scruff) and 1014 molecules of Xenofluor 750 (lower dorsal region) 605nm excitation filter.



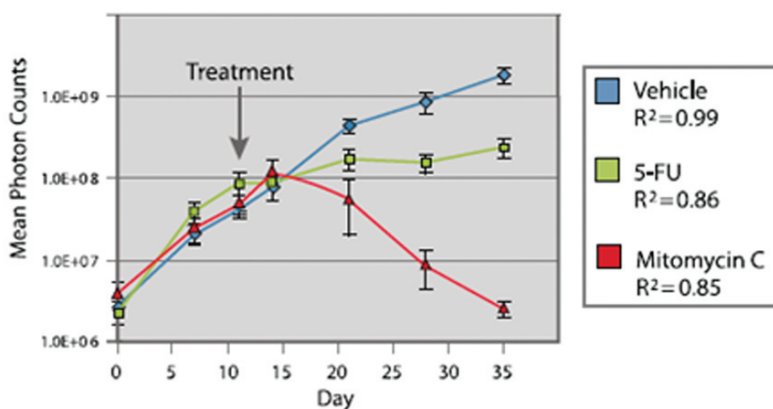
Dual Reporter Imaging - High Resolution Ex Vivo Applications

Bacterial luc (500nm) and GFAP (620nm) brain imaging from mice with Pneumococcal Meningitis. *Ex Vivo Kadurugamuwa et al., Infection and Immunity, 2005.*

Living Image Software with IVIS Lumina II System

The wide range of IVIS system instrument settings, combined with absolute calibration of each setting, allows users to track signals during longitudinal studies that vary by many orders of magnitude. In this drug study, tumor signals vary by three orders of magnitude during the course of a 35 day experiment. The capability of Living Image Software makes this type of analysis simple for the user in both fluorescent and bioluminescent modes.

Longitudinal Bioluminescent Tumor Study



Inside the IVIS Lumina II

CCD Camera

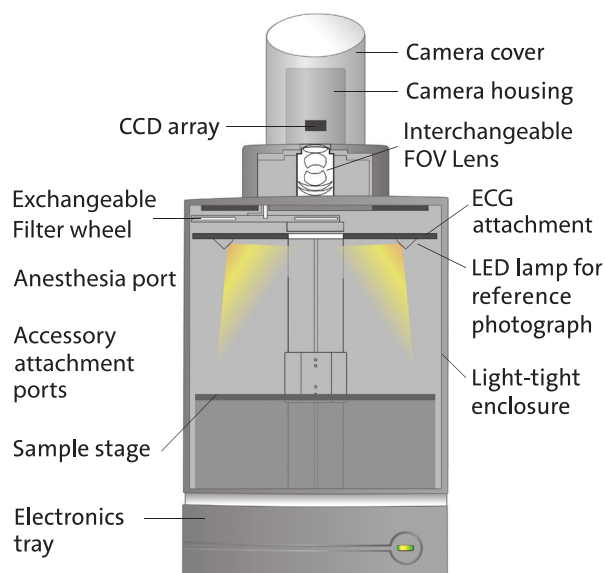
- The IVIS Lumina II CCD is 13 x 13 mm square, with 1024 x 1024 pixels 13 micron in width, yields higher imaging resolution
- Back-thinned, back-illuminated grade 1 CCD provides high quantum efficiency over the entire visible to near-infrared spectrum
- 16 bit digitizer delivers broad dynamic range
- The CCD is thermoelectrically (Peltier) cooled to -90 °C ensuring low dark current and low noise

Imaging Chamber

- Light-tight imaging chamber
- High light collection lens, f /0.95 – f/16
- Optional 24cm FOV lens attachment
- 8 position emission filter wheels
- Replaceable filter wheel upgrades for high resolution fluorescence imaging
- LED lamps for photographic images
- Heated stage to maintain optimum body temperature
- Motor controlled stage, filter wheel, lens position, and f-stop
- Optional integrated ECG monitoring system

Integrated Gas Anesthesia

- Gas anesthesia ports and 5 position manifold within imaging chamber allow anesthesia to be maintained during imaging sessions



IMAGING SYSTEM COMPONENTS	SPECIFICATIONS
Camera Sensor	Back-thinned, back-illuminated, cooled Grade 1 CCD
CCD Size	1.3 x 1.3 cm
Imaging Pixels	1024 x 1024
Quantum Efficiency	>85% at 500 – 700 nm, >30% at 400 – 900 nm
Pixel Size	13 microns
Min. Detectable Radiance	100 photons/s/sr/cm ²
Min. Field of View (FOV)	5 x 5 cm
Max. Field of View (FOV)	12.5 x 12.5 cm (optional 24 x 24 cm)
Min. Image Pixel Resolution	50 microns
Read Noise	< 3 electrons for bin=1,2, 4; < 5 electrons for bin=8, 16
Dark Current (Typical)	<120 electrons/s/cm ² ; or 2 x 10 ⁻⁴ electrons/s/pixel
Min. Detectable Radiance	100 photons/s/sr/cm ²
Lens	f/.95 – f/16, 50 mm
Fluorescence Capability	Standard
Excitation Fluorescence Filters	10
Emission Fluorescence Filters	4 standard (Optional 3 sets of 7 high resolution filters)
Fluor. Bkg. Subtraction Filters	Included
CCD Operating Temp	-90 °C
Imaging System Space Requirement	48 x 71 x 104 cm (W x D x H)
Imaging Chamber Interior Dimension	43 x 38 x 43 cm (W x D x H)
Power Requirements	6A at 120V
Stage Temperature	20 – 40 °C
Computer (Minimum specifications)	2.8 GHz, 1 GB RAM, RW CD/DVD, 80 GB HD, 20" flat screen monitor
Living Image Software	1 acquisition copy and 4 analysis copies of Living Image software 3.0.4x and higher

Front cover images:

Top Left: Orthotopic prostate tumor (PC-3) labeled with GFP (Courtesy of AntiCancer)
 Middle: Sample of the Lumina ECG monitoring system,
 Bottom: Subcutaneous injections of XenoFluor 680 and XenoFluor 750

Any use of products or material containing DNA sequences coding for mutant *Aequorea victoria* green fluorescent protein (GFP) variants or proteins thereof requires a license from GE Healthcare UK Limited.



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