

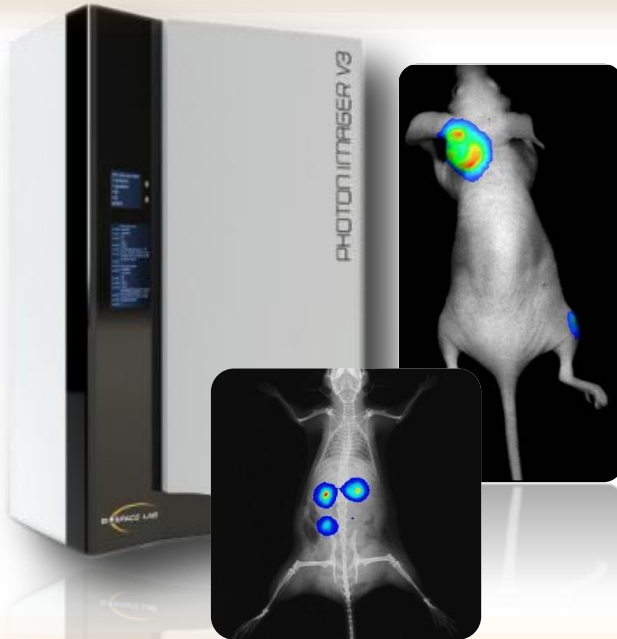
BIOSPACE LAB

The world leader in **REAL-TIME** Imaging



PHOTONIMAGER™

THE OPTICAL IMAGER FOR OPTIMAL IMAGING



3D/4D

MICROSCOPY

**MULTISPECTRAL
ANALYSIS**

X-RAY

IN ACTIO®

BIOSPACE LAB

**REAL-TIME BIOLUMINESCENCE
AND FLUORESCENCE IMAGING**

BIOSPACE LAB

A UNIQUELY MODULAR INSTRUMENT FOR DETECTING, LOCALIZING,
QUANTIFYING DYNAMIC BIOLUMINESCENCE OR FLUORESCENCE SIGNALS
IN VIVO AND IN VITRO

BIOLUMINESCENCE & FLUORESCENCE IMAGING

- **Full spectrum imaging capability** from blue to near-infrared in bioluminescence and fluorescence:
 - Continuous selection of excitation wavelength from 450 up to 1000 nm
 - Equipped with up to 10 band pass emission filters
- **Automated autofluorescence subtraction**
- **Spectral Unmixing**
- **Multilabeling Capacities**
- **From whole body to cell dimensions**

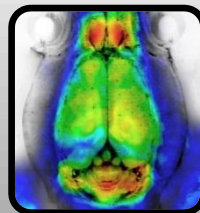
UNMATCHED PERFORMANCE & ACCURACY

- **High Sensitivity - The most sensitive system on the market** for detection of weak signals
 - **Intensified CCD camera** with negligible read out noise
 - **No more pixel binning** and exposure time settings prior to imaging
 - Signal acquisition **from the very first second**
- **High Temporal Resolution of 23ms**
- **Accurate signal localization and quantification**

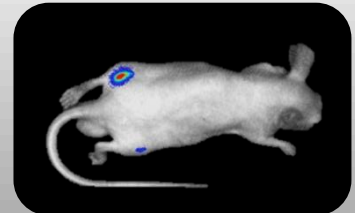
**MAIN APPLICATIONS
OF THE PHOTONIMAGER™**

BIODISTRIBUTION
CANCER RESEARCH
GENE EXPRESSION
INFECTIOUS DISEASES
NEUROSCIENCES
PHARMACOKINETICS
STEM CELLS

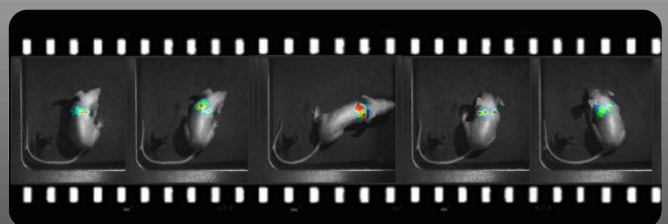
GFP labelled neuronal precursors in a mouse brain
Fluorescence mode



R1M-fluc positive tumor on the right flank of a mouse
Bioluminescence mode



InActio® imaging of a freely moving mouse carrying a Luciferase expressing tumor, **InActio® Module**



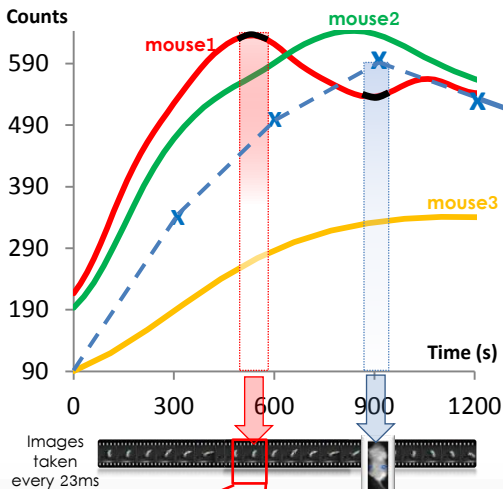
REAL-TIME IMAGING CAPABILITY

- The **Real-Time imaging capability** of the PhotonIMAGER™ system **allows the signal kinetics to be followed precisely and independently**, even when the signal is weak
- The ideal signal **measurement window can always be accurately selected** for each animal or anatomical region in turn
- No need to assume a hypothetical output curve as **the actual kinetic curves are available**
- Allows the **recording of fast signal kinetics**

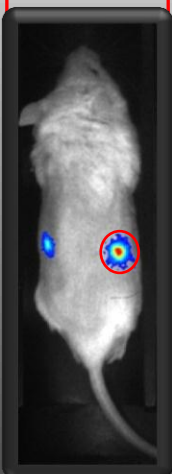
IMPORTANCE OF REAL-TIME SIGNAL ACQUISITION

Bioluminescence signal from mice following subcutaneous injection of Mesenchymal stem cells expressing Luciferase

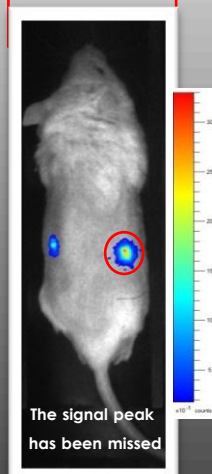
Real-Time kinetic curves of the three **different mice** during the same acquisition



Mouse 1
measured at the signal plateau of the **Real Time kinetic curve** of mouse 1

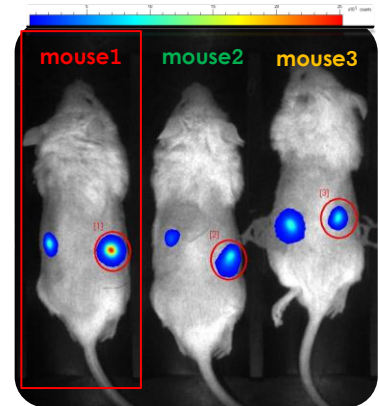


Mouse 1
measured at the signal plateau of the **standard kinetic curve**



A pre-determined **standard kinetic curve** is often used as a reference for determining the acquisition time needed for bioluminescence imaging. (This takes no account of the differences in signal kinetics obtained in different animals.)

Bioluminescence acquisition of three mice at the same time



Kinetics of bioluminescence signal *in vivo* can vary from one animal to another (**see figure.**) and from one organ to another.

To accurately compare bioluminescence signals, **each measurement should be taken at the signal plateau** surrounding the peak signal intensity for each Region of Interest (ROI).

THE PHOTONIMAGER™ is the only system which **provides precise control over the time-zone selected for the measurement of each ROI, both during and following signal acquisition**

ONE MODULAR SYSTEM FOR ALL APPLICATIONS

The modular design philosophy allows you to keep up with the latest developments in imaging technologies – existing optional modules and future options can be added to the basic instrument configuration

AN UPGRADABLE SYSTEM WITH STATE-OF-THE-ART TECHNOLOGY DEVELOPMENT

IN ACTIO® MODULE

for kinetic imaging of freely moving animals

4-VIEW MODULE

for multi-angle acquisition

3D/4D MODULE

for 3D and 4D kinetic rendering of 4-View imaging

X-RAY MODULE

for accurate anatomic localization of signals

MACROLENS MODULE

for higher resolution imaging

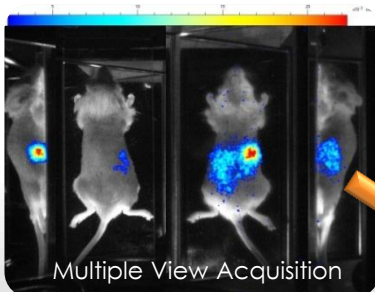
MACRO2MICRO MODULE

for micron-resolution imaging

MULTISPECTRAL MODULE

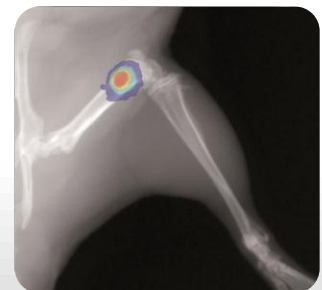
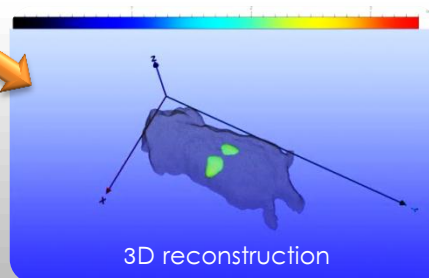
for multispectral imaging

Luciferase expressing Hep3B tumor cells localized Subcutaneously and in the liver of a mouse



Real-Time bioluminescent signal acquisition using the 4-View module

Volumetric bioluminescent signal reconstruction from the 4-View data using the **M3Vision Analysis Software**



Anatomic localization of bone metastasis using the X-Ray module

USER FRIENDLY

- **High throughput system** for longitudinal studies – up to 5 mice at the same time
- **Ease of manipulation** – sliding stage, continuously variable field of view
- **Designed for maintenance of animal welfare** – thermoregulated stage, anaesthesia system
- Multiple imaging modalities and comprehensive analysis by the **M3Vision™ Software**

TECHNICAL SPECIFICATIONS

PHOTON IMAGER™ RT

PHOTON IMAGER™ OPTIMA

Camera		
Sensor	Intensified CDD camera (18mm)	Intensified CDD camera (25mm)
Objective Lens	24mm, f/1.4-22	50mm, f/1.2-16
Operating Temperature	-25°C	-25°C
Performance		
Detection Spectral Range	370-900	370-900
Temporal Resolution	23ms	23ms
Minimum Detectable Radiance	70photons/s/sr/cm ² w/out binning	37photons/s/sr/cm² w/out binning
Binning	Not needed	Not needed
Dynamic Range	>5.0 orders of magnitude	>5.0 orders of magnitude
CCD Read Noise	No	No
Dark Current Noise	25 e ⁻ /s/cm ²	25 e ⁻ /s/cm ²
Field of View (FOV)	Minimum 3.4x2.8mm Maximum 25.5x18cm	Minimum 3.4x2.8mm Maximum 31.5x23.5cm
Minimum Image Pixel Resolution	5µm	2.5µm
Illumination		
Source	150W Halogen lamp	150W Halogen lamp
Fluorescence	Selectable multi-wavelength	Selectable multi-wavelength
Filters		
Excitation Filters	450-750nm	450-1000nm
Emission Filters	6 filters	10 filters
Autofluorescence Substraction	✓	✓
Multilabelling Capability	✓	✓
Spectral Unmixing	✓	✓
Animal Management		
Gas Anesthesia	✓	✓
Heated Stage	25°C - 45°C	25°C - 45°C
Imaging Chamber Size	25x26x38cm (WxDxH)	50x40x70cm (WxDxH)
Modules		
Kinetic Imaging	✓	✓
Simultaneous Multiple Views	✓	✓
3D Reconstruction Software	✗	✓
2D X-Ray analysis and Registration	✗	✓
In Actio Analysis and Registration	✓	✓
System Requirements		
Operating System	Windows XP/7	Windows XP/7
Power Consumption	1KW @ 150 or 230V	1KW @ 150 or 230V
Dimensions	60x75x105cm (WxDxH)	60x85x140cm (WxDxH)
Weight	85 KG	140 KG
Portable Cart	✗	✓

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