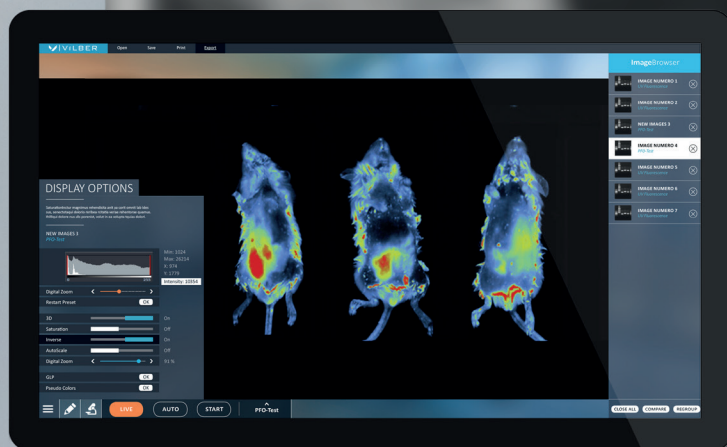


NEWTON 7.0

BIOLUMINESCENCE & FLUORESCENCE IMAGING



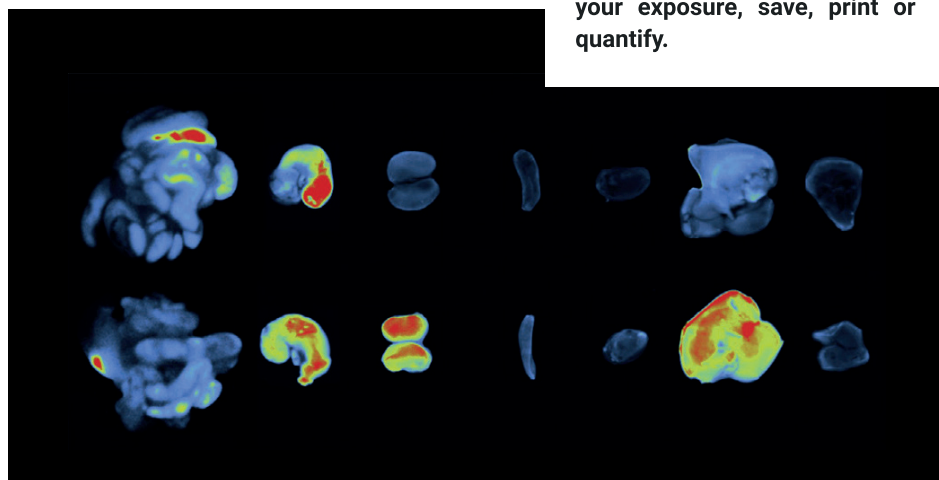
NEWTON 7.0

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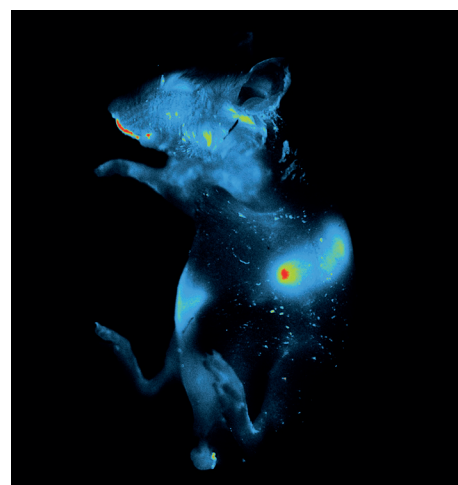


IN VIVO - IN VITRO IMAGING

The NEWTON's protocol driven image acquisition is as quick as it is intuitive: adjust your exposure, save, print or quantify.



Dox distribution - Ex vivo fluorescence imaging of organs at 10 h post-oral-administration



Tumoral cells expressing luciferase, 6 weeks after injection

Newton 7.0

APPLICATIONS

The NEWTON 7.0 is a highly sensitive optical imaging system dedicated to the visualization of in vivo, in vitro and ex vivo applications. Various bioluminescent reporters like firefly luciferase and many fluorescent molecular reagents can be used to visualize and track tumor, disease or inflammation development, target molecules to nanoparticles or follow biodistribution and pharmacokinetics studies within living animals in a non-invasive manner.

BIOLUMINESCENCE

The NEWTON 7.0 proprietary optics have been specifically developed for macro imaging with high light collection capacity, incorporating a unique combination of high numerical aperture and long working distance.

The NEWTON 7.0 custom made V.070 lens combines sensitivity and optical performance for very faint light conditions. The optical system includes ultra-low dispersion components to enhance the sensitivity, and aspheric elements to deliver consistently sharp images. The main function of a camera lens is to collect light. The lens aperture represents its capability to collect as much light as possible in a given period. Its sensitivity is usually expressed by a range of f-stops. The smaller the f-stop number, the larger the aperture. A lower f-number denotes a greater aperture opening, which allows more light to reach the CCD sensor. The aperture of the V.070 lens is f/0.70, providing faster imaging and better sensitivity compared to all other imagers.

FLUORESCENCE

The advent of novel fluorescent probes has increased the demands on in-vivo fluorescence imaging systems to be able to deftly handle a variety of simultaneous signals. The best spectral range for penetrating an animal is between 600 nm and 900 nm. With NIR fluorescence detection, background is very low, and tissue autofluorescence does not limit performance.

The NEWTON 7.0 offers 8 excitation channels in the visible RGB and NIR spectrums. Each individual light source delivers a precisely defined range of the spectrum. The very tight LED spectrum is additionally constrained with a very narrow excitation filter. This means less background in the images of your sample and a higher signal to noise ratio to detect the weakest signals.

Bright fluorescence observation can be performed in a rapid scanning mode that shortens exposure times and minimizes specimen damage. The scientific LED beam scans the entire imaging bed surface to provide an unrivalled light homogeneity for a more accurate signal quantification, delivering a precise and traceable quantity of energy for 100% reproducibility of an experiment.

Signals can be overlaid so that up to 4 reporters can be visualized simultaneously for multispectral imaging applications. Crosstalk issues are then overcome using Spectral Unmixing function that separates the different signals, so that each channel contains only the signal from one reporter.

A large number of probes and stains can be used such as GFP, RFP, FITC, mCherry, DAPI, Alexa Fluor® 680, 700, 750, Cy® 3, 5, 5.5, DyeLight, IRDye® 800CW, VivoTrack 680, VivoTag 750...

The NEWTON 7.0 is calibrated according to NIST standards. The calibration is based on the use of a NIST traceable luminometer reference source that allows the reading comparison to the NIST established baseline. The system's performance can then be tested periodically with confidence.

3D OPTICAL TOMOGRAPHY

Bioluminescence Tomography (BLT) as well as Fluorescence Molecular Tomography (FMT) are imaging techniques providing further quantitative and localized analyses of a source distribution within a living animal from signals measured on the body surface of the animal.

The NEWTON 7.0 integrates an innovative 3D Tomography imaging module that reconstructs bioluminescent or fluorescent signals into volume that are overlaid within the 3D topographic model of the subject.

For a better understanding of anatomical and deeper tissue structures, the digital organ library allows the superimposition of the mouse organs to the tomographic image to identify the source localization with precision.



NEWTON 7.0



SUPERIOR QUANTITATIVE RESULTS

Ultimate linearity for precise protein quantification over the full dynamic range.



MULTISPECTRAL IMAGING

Ultra-low noise imaging thanks to a dual camera amplifier architecture.



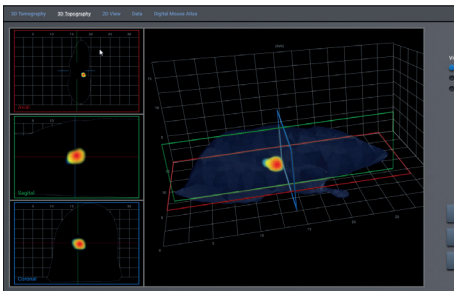
CUSTOM MADE V.070 LENS

Newton custom made lens for enhanced sensitivity and sharpness.

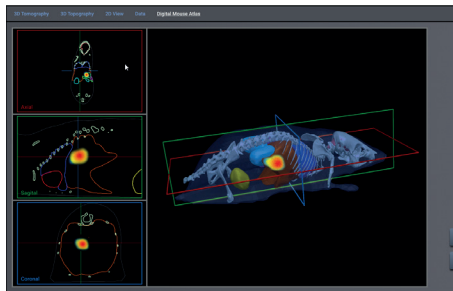


NARROW BANDPASS FILTERS

Time to get the image is drastically reduced and precious antibody can be saved.



3D BLT imaging



Digital mouse organs co-registration



Bioesthesia station

USER FRIENDLINESS

The NEWTON's protocol driven image acquisition is as quick as it is intuitive. Easily position the animals using the sliding-out imaging bed, select your protocol and click on start. The camera is motorized on the Z-axis to go from a large field of view to a macro imaging with ease of use. The imaging bed is by default thermoregulated to +37°C and its temperature can be controlled from 20°C to 40°C, or even switched off for ex vivo or in vitro applications. It is also motorized on X/Y-axis and is detachable should you need to do preparative work on the bench before the imaging process.

ANIMAL MANAGEMENT

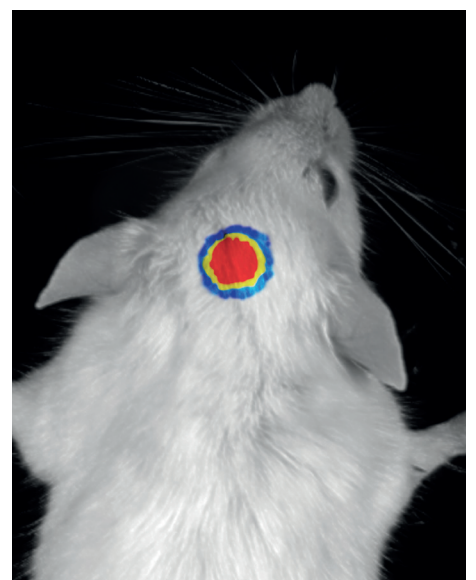
The BIOSTHESIA system has been specially designed for inhalation of isoflurane agents by laboratory animals. The BIOSTHESIA is a small weight device, compact and robust, which can be used as a standalone unit on a

table. As it is transportable, it can be moved from one place to another in no time and can be immediately operational.

The system is composed of a medical grade digital flowmeter, a precision TEC3 format vaporizer, an active charcoal filter, a breathing circuit with mouse nosecone/mask and an induction box.

The BIOSTHESIA vaporizer is designed to operate with isoflurane and is calibrated using a laser refractometer, to ensure accuracy of use. In addition, our vaporizer has a safety lock function, to prevent accidental turn on making the BIOSTHESIA vaporizer not only one of the most accurately manufactured and certified vaporizer, but one of the safest.

An isolation chamber sealed with HEPA-SPF filters can be supplied for the transportation and the imaging of immunocompromised animals, so that pathogens cannot get inside or outside the box.



Imaging Versatility

Visualization and tracking of tumor development or disease progression in the living animal
Signals overlay so that several reporters can be visualized simultaneously
In vitro and in vivo cells migration tracking
Signal quantification

NEWTON 7.0

Performance

Proprietary V.070 lens with f0.70 aperture
1" scientific grade CCD camera
Bioluminescence detection
Fluorescence detection
3D Optical Tomography



Ease Of Use

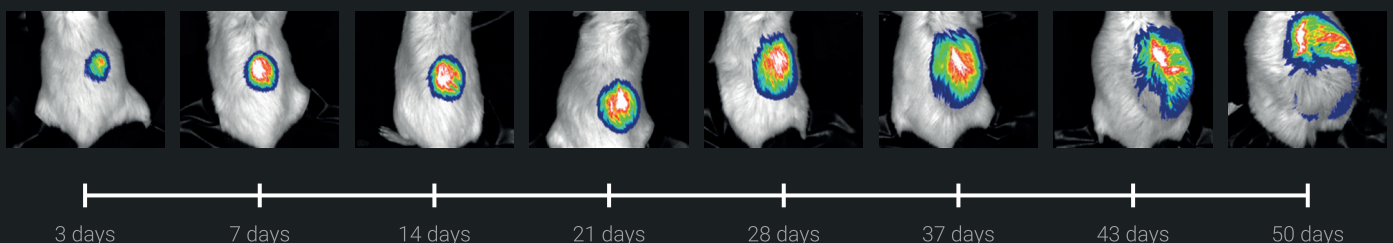
Intuitive user interface
One click to get the image
Auto-exposure and automatic illumination control
Easy to clean

Animal Management

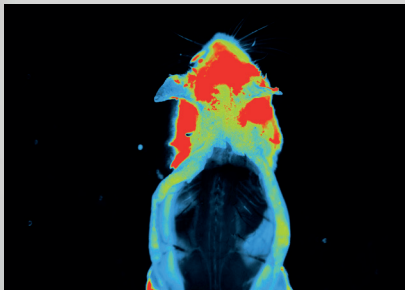
Large 20x20 cm FOV for multi-subject imaging
Heated animal bed
EQUAFLOW™ breather to deliver equal gas to each nose cone to prevent unwanted animals awakening
Active gas scavengers
Compatible with the BIOSTHESIA gas anesthesia system
Up to 5 mice

Non-Invasive Imaging

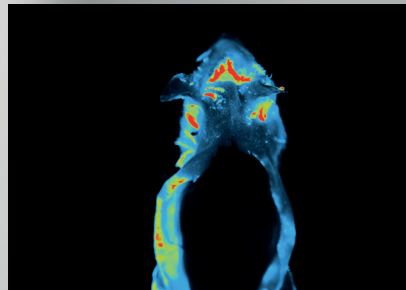
The NEWTON bioluminescence imaging mode allows the non-invasive detection and quantification of orthotopic, metastatic and spontaneous tumors in the whole mouse. The system allows you to monitor tumor development right from the onset and collect and compare data throughout tumor development.



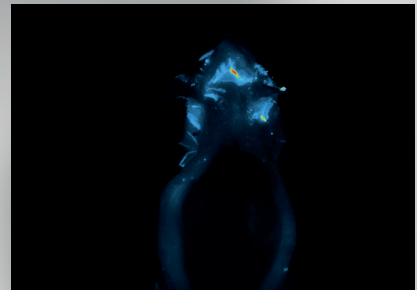
	BT100	FT100	BT500	FT500
Camera	DarQ-9 1" Scientific CCD Sensor 2160x2160 (4.6 MP)	DarQ-9 1" Scientific CCD Sensor 2160x2160 (4.6 MP)	DarQ-9 1" Scientific CCD Sensor 2160x2160 (4.6 MP)	DarQ-9 1" Scientific CCD Sensor 2160x2160 (4.6 MP)
Cooling	-90°C	-90°C	-90°C	-90°C
Lens	f/0.70	f/0.70	f/0.70	f/0.70
Bioluminescence	✓	✓	✓	✓
VIS/NIR Fluorescence	upgradeable	400>900nm	upgradeable	400>900nm
3D Optical Tomography	✓	✓	✓	✓
Emission Filter-Wheel	11-positions	11-positions	11-positions	11-positions
Field of View	12x12cm	12x12cm	6x6cm to 20x20cm	6x6cm to 20x20cm
Animal Capacity	1 or 3 mice	1 or 3 mice	5 mice / 3 rats	5 mice / 3 rats
Heated Stage	✓	✓	✓	✓
Anesthesia Station	Optional	Optional	Optional	Optional



*Blue excitation
High autofluorescence*



*Green excitation
Moderate autofluorescence*



*Near infrared excitation
Low autofluorescence*



HEADQUARTERS

Vilber Lourmat
ZAC de Lamirault
Collegien
F-77601 Marne-la-Vallee cedex 3
France
Phone : + 33 (0) 1 60 06 07 71
info@vilber.com

GERMANY

Vilber Lourmat
Deutschland GmbH
Wielandstrasse 2
D-88436 Eberhardzell
Deutschland
Phone : + 49 (0) 7355 931 380
info@vilber.de

CHINA

Vilber China
Room 127 Building A
N° 111 Yuquangying
Fengtai District – Beijing
China
Phone : + 86 1361 1131 545
info@vilber.cn