

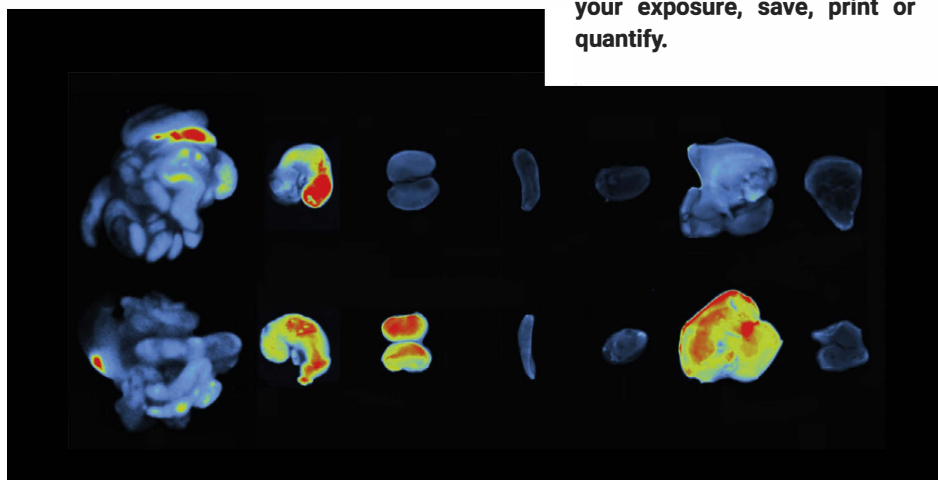
# NEWTON 7.0

## BIOLUMINESCENCE & FLUORESCENCE IMAGING

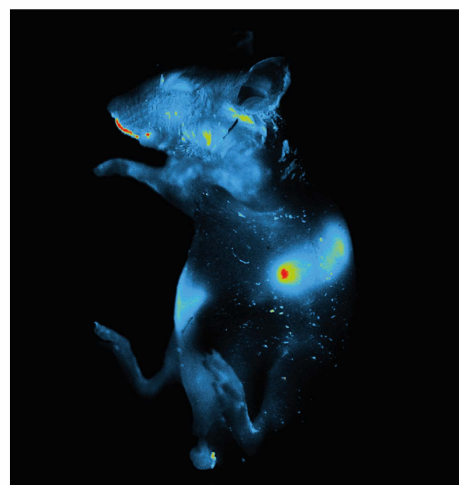


IN VIVO - IN VITRO IMAGING

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.

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) is an imaging technique 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 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.



### 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.



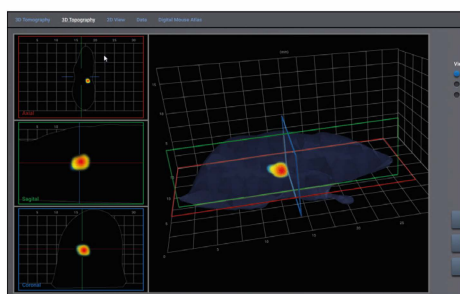
### CUSTOM MADE V.070 LENS

Newton custom made lens for enhanced sensitivity and sharpness.

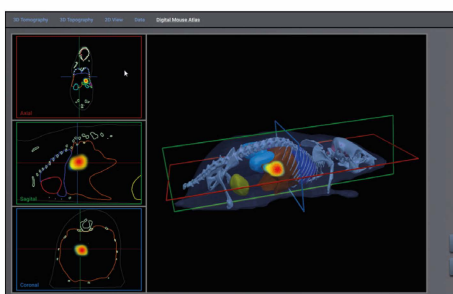


### NARROW BANDPASS FILTERS

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

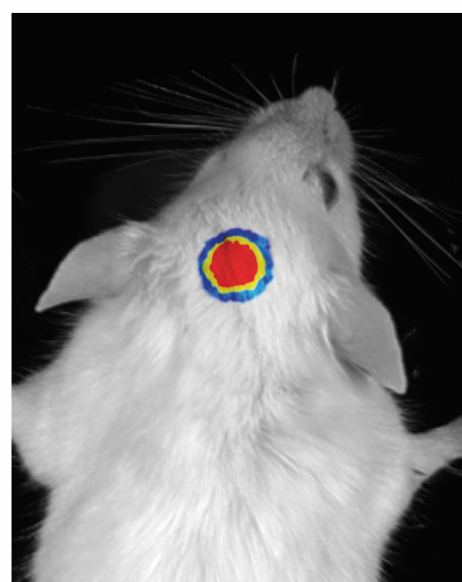
The BIOTHERESIA system has been specially designed for inhalation of isoflurane agents by laboratory animals. The BIOTHERESIA is a small weight device, compact and robust, which can be used as a standalone unit on a

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 nose-cone/mask and an induction box.

The BIOTHERESIA 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 BIOTHERESIA 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

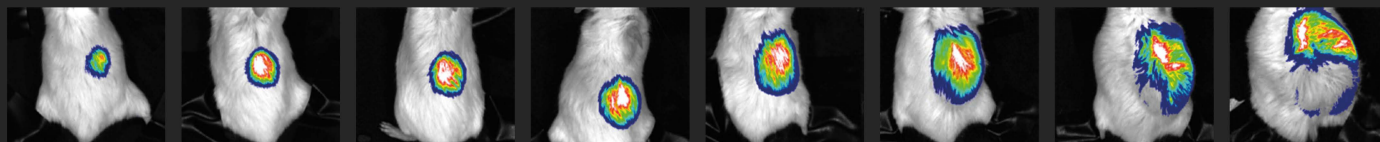
Intuitive user interface  
One click to get the image  
Auto-exposure and automatic illumination control  
Easy to clean

## 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.



3 days

7 days

14 days

21 days

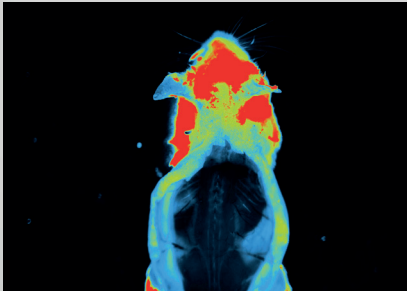
28 days

37 days

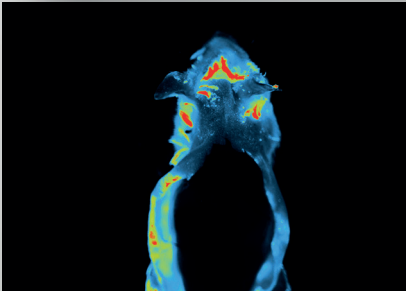
43 days

50 days

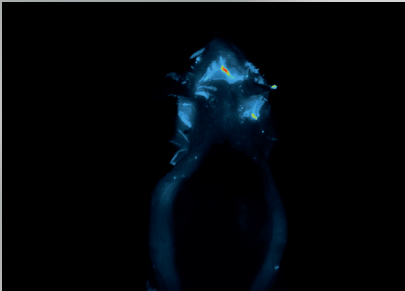
	BT100	FT100	BT500	FT500
<b>Camera</b>	DarQ-11 1" Scientific CCD Sensor 2160x2160 (4.6 MP)	DarQ-11 1" Scientific CCD Sensor 2160x2160 (4.6 MP)	DarQ-11 1" Scientific CCD Sensor 2160x2160 (4.6 MP)	DarQ-11 1" Scientific CCD Sensor 2160x2160 (4.6 MP)
<b>Absolute Cooling</b>	-90°C	-90°C	-90°C	-90°C
<b>Lens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



Blue excitation  
High autofluorescence



Green excitation  
Moderate autofluorescence



Near infrared excitation  
Low autofluorescence





#### **HEADQUARTERS**

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