

NEWTON 7.0 - BIO

Bioluminescence &
Fluorescence Imaging

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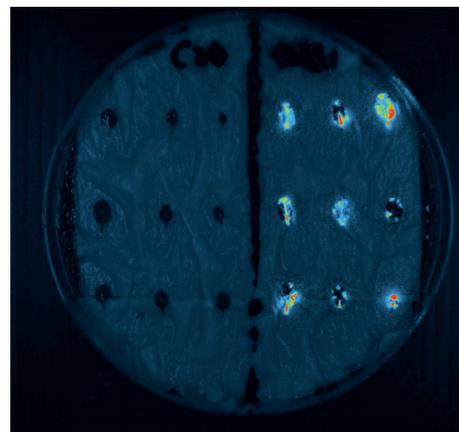
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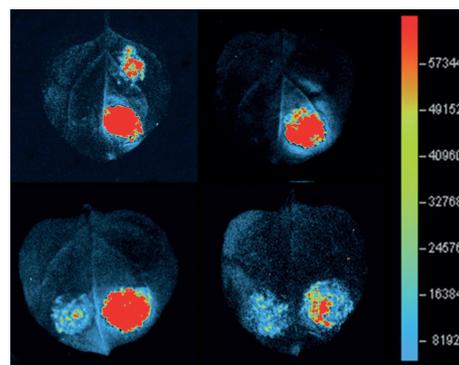
WHOLE PLANT IMAGING

 **VILBER**
Smart Imaging

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



Cloned Plant screening: *Arabidopsis thaliana* seedlings transfected with luciferase (right) and nontransfected (left), 3min exposure after 1 mM luciferin was sprayed onto the leaves.



Research on microbial infection of plants - BIK1 and FLS2 interact with RbohD in *N. benthamiana*. The indicated constructs were transiently expressed in *N. benthamiana*, and luciferase complementation imaging assay was performed.

SMART IMAGING SYSTEM

The NEWTON 7.0 system combines high sensitivity with advanced plant imaging features and user-friendly time-saving operation.

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. Bright fluorescence observation can be performed in a rapid scanning mode that shortens exposure times and minimizes specimen damage. Observation is thus possible even with slight body movement. The fast lens is also ideal for luminescence applications requiring longer exposure time.



Ultimate sensitivity with the widest f/0.70 lens aperture

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. Our dual magnetron filter technology ensures transmission above 90% and very narrow band cutting - meaning improved spectral separation and increased sensitivity. Our detection spectral range goes from 400 to 900nm, making the NEWTON 7.0 ideal for GFP, YFP or simultaneous IR applications. With the NEWTON 7.0 optical imaging system, you can image bioluminescent reporters like firefly luciferase and rapidly quantify the signal. The system allows you to visualize infections in whole plants and leaves, compare plant virology, regulate plants growth or observe the stress tolerance.

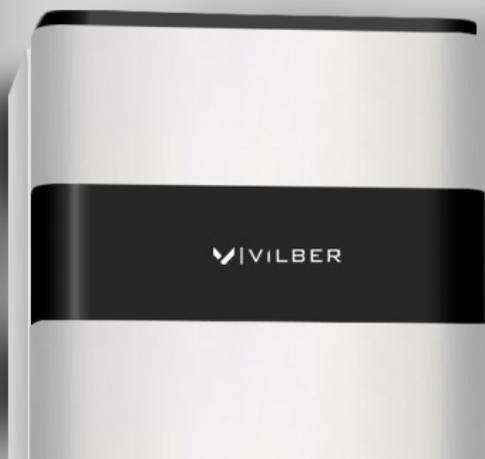
FLUORESCENCE & BIOLUMINESCENCE APPS STUDIO APPLICATION LIBRARY

The NEWTON 7.0 includes our revolutionary Apps Studio approach to imaging. The Apps Studio is an innovative library of applications which contains more than 40 different protocols for a wide variety of targeted and easily activated fluorescent probes and reporters. The Apps Studio contains the excitation and the emission spectra of the main fluorophores used in modern molecular biology laboratory. It also suggests

the best possible system configuration in terms of light source excitation, emission filter and sensitivity level. The Apps Studio ensures reproducibility and one click image acquisition for the best ease of use. The Newton 7.0 accommodates 8 excitation channels in the visible RGB and NIR spectrum.. Signals can be overlaid so that several reporters can be visualized simultaneously.

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. The LED Spectra Capsules can be easily changed, meaning that NEWTON 7.0 can be adapted simply as the requirements of your applications evolve.

A large number of dyes and stains can be used such as GFP, YFP, Pro-Q Emerald 300, Sypro-Ruby, FITC, DAPI, Alexa Fluor® 680, 700, 750, Cy® 3, 5, 5.5, DyeLight, IRDye® 800CW, VivoTrack 680, VivoTag 750...



NEWTON 7.0 BIO



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

FUSION custom made lens for enhanced sensitivity and sharpness.



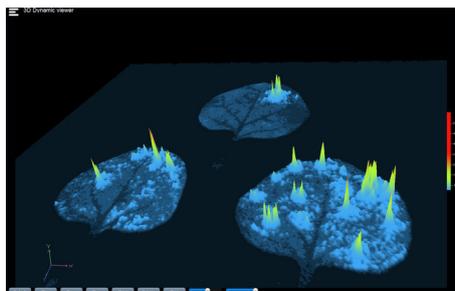
NARROW BANDPASS FILTERS

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

QUANTITATIVE IMAGING

Sensitivity is a key feature to detect a bioluminescence or fluorescence signal. Broad linear dynamic range is necessary to compare weak and strong signals in the same image.

The NEWTON 7.0 achieves the best signal to noise ratio for the lowest limits of detection. The system is extremely linear over its wide dynamics and can easily detect large intensity difference between bright and faint signals before reaching saturation. The broad linear dynamic range enables relative quantification of target proteins with confidence.



NEWTON 7.0 Software - 3D Dynamic Scan

PLANT MANIPULATION ROTATING STAGE

The NEWTON 7.0 BIO has been specially designed to handle plants with minimum manipulation. Simply position your pot on the dedicated tray, the stage can be inclined by 15° on the X/Y axis to visualize the plants from different angles and is easily controlled from the software interface, avoiding time consuming manual manipulation. The rotating stage is also motorized on the Z-axis to get closer to the CCD camera depending on your sample size, giving the possibility to image whole plants, leaves and seedlings with an enhanced sensitivity and image resolution.



Height Adjustable Plant Stage

When a whole plant is being imaged, it could be difficult to focus on a specific part of the plant. With the NEWTON 7.0 BIO's new generation of CCD camera, simply click on the leaf of interest for an immediate focusing with no manual adjustment.

Various imaging modes are available from automatic, manual, or time-lapse imaging program. Benefit from our 3D Dynamic Scan technology and observe the different signal intensities in a live 3D video reconstruction. The unique color imaging mode helps you acquire a quick snapshot of your plants with a true color representation, making the documentation faster!

Versatile Applications

- Comparative Plant Virology
- Genetic Regulation
- Infection Monitoring
- Regulation of Plant Growth
- Stress Tolerance

NEWTON 7.0 BIO

Performance

- Proprietary V.070 lens with f0.70 aperture
- 1" scientific grade CCD camera
- Bioluminescence detection
- Fluorescence detection



Ease of Use

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

Wide Detection

- Luciferase Expression
- GFP Expression
- Chlorophyll Phosphorescence
- NIR Illumination

Daylight / Nightlight Simulation

Monitor the growth of a plant overtime thanks to the Daylight and Nightlight simulation modes. The system allows you to collect and compare data throughout the growth of plants.



3 days

7 days

14 days

21 days

28 days

37 days

43 days

50 days

NEWTON 7.0 BIO

Bioluminescence, Chemiluminescence
& Fluorescence detection

PERFORMANCE

Bioluminescence detection : femtogram level
Fluorescence detection : picogram level

CAMERA & OPTICS

Scientific grade 16-bit CCD camera
Grade 0, 400-900nm / 4.8 O.D.
-90°C delta Cooling
f/0.70 motorized lens aperture
Image resolution: 10 megapixels
Native resolution: 2160x2160
Peak Quantum Efficiency: 80%
FOV minimum: 6x6cm (macro imaging)
FOV maximum: 20x20cm (whole plant)

ILLUMINATION

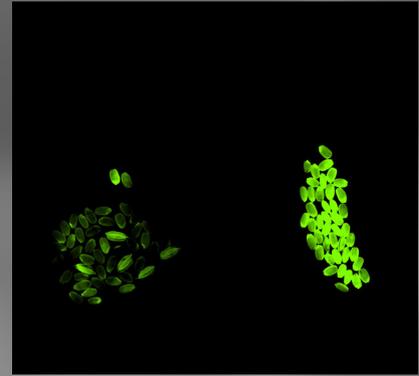
Dual White-Light LED Panels
8 excitation channels:
440nm - 480nm - 540nm - 580nm
640nm - 680nm - 740nm - 780nm
11-Position Motorized Filter Wheel
8 Narrow Bandpass Emission Filters:
500nm - 550nm - 600nm - 650nm
700nm - 750nm - 800nm - 850nm

HARDWARE CAPABILITIES

Intelligent Darkroom concept
Fully-automatic system
•Motorized Optical Lens
•Z-axis Motorized Camera
•15° Tilting sample stage

SOFTWARE

Automatic, Manual & Serial Acquisition modes
Exposure time minimum: 40 milliseconds
Exposure time maximum: 2 hours
3D live Dynamic Scan
Image Editing and Image Analysis
included Chemiluminescence and fluorescence on
Western, Northern or Southern blot.



*eGFP transfected rice grains
excitation 480nm and emission filter F-565,
exposure time 0.8 sec.*



*GFP expression
GFP-transfected (right) and Control (left)
tobacco leaves, Epi
excitation 480nm and emission filter F-565,
exposure time 2sec.*



*Plant Virology
Agroinfiltration in *Nicotiana Benthamiana*
16c, observed under blue excitation (480nm
with F-565) to localize the GFP expression*



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