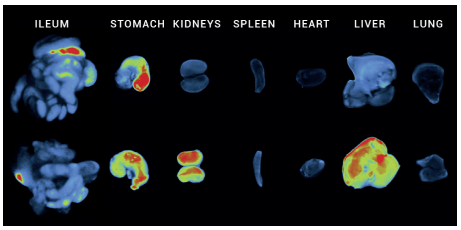
NEWTON 7.0

BIOLUMINESCENCE & FLUORESCENCE IMAGING

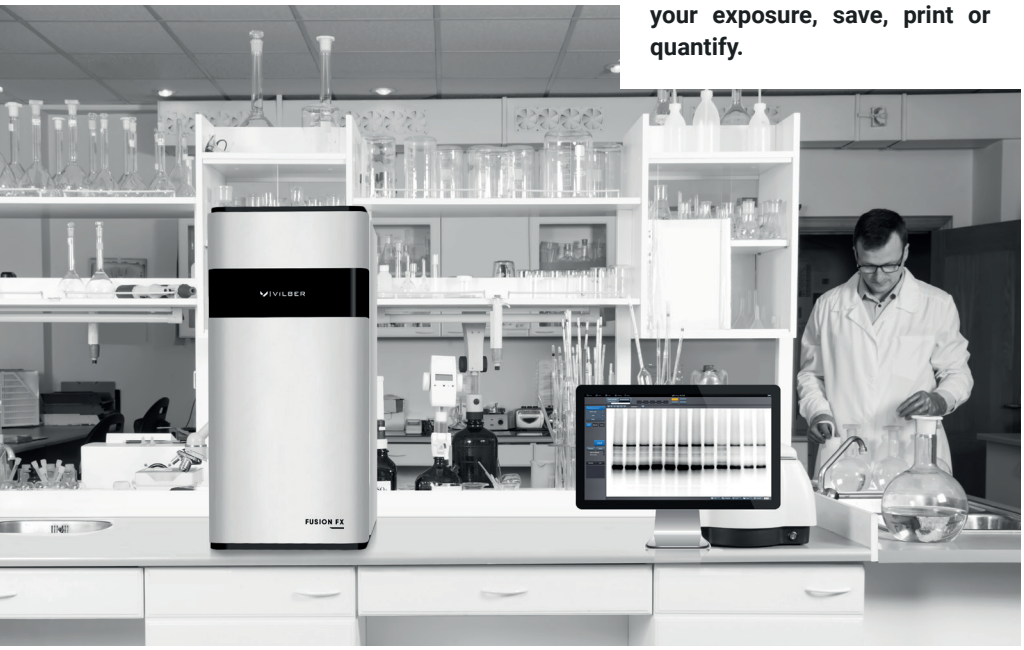
IN VIVO - IN VITRO IMAGING

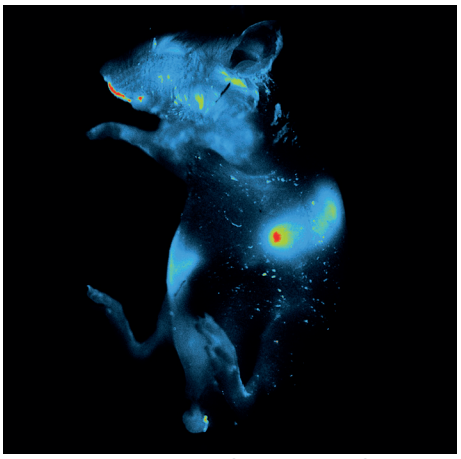
VILBER
Smart Imaging



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

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





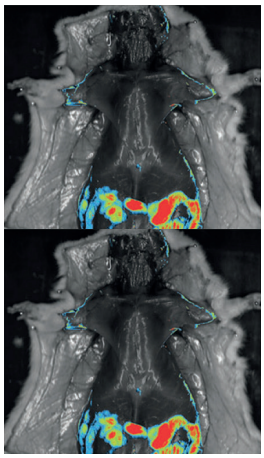
Tumoral cells expressing luciferase, 6 weeks after injection

SMART IMAGING SYSTEM

The NEWTON 7.0 system combines high sensitivity with advanced animal-handling 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.

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, specifically in the IR and NIR area. 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 IR applications. The best spectral range for penetrating an animal is between 600 nm and 900 nm. With NIR and IR fluorescence detection, background is very low, and tissue autofluorescence does not limit performance.



In vivo distribution of DOX-T (DOX 1.54 mg mL^{-1}) in rats

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 and track tumor development or disease progression in the living animal, follow the spread of a tumor, or look for drug effects. The NEWTON 7.0 interface helps you to follow the same group of animals over an extended period of time to observe changes in individual animals.

FLUORESCENCE&BIOLUMINESCENCE APPSSTUDIOAPPLICATIONLIBRARY

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.

Thanks to the Spectra LED modules, the NEWTON 7.0 can accommodate up to 6 excitation channels in the IR, NIR, visible RGB and UV area. Signals can be overlayed 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 modules 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

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.

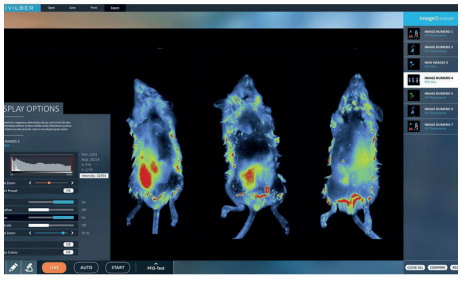
CUSTOM MADE V.070 LENS
FUSION custom made lens for enhanced sensitivity and sharpness.

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 bands before reaching saturation. The broad linear dynamic range enables relative quantification of target proteins with confidence.


NEWTON 7.0 Software

Fill & Drain

ANIMAL MANAGEMENT
BIOSTHESIA MODULE

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 nose-cone/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.

The BIOSTHESIA could supply at the same time the induction box and the imaging rack for one, two or five mice.

NEWTON 7.0

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

Performance

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

Ease Of Use

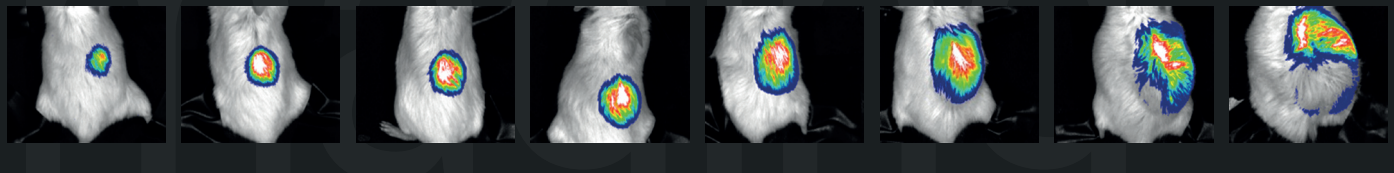
- Intuitive user interface
- One click to get the image
- Auto-exposure and automatic illumination control
- Easy to clean

Animal Management

- Large 23x23 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.



NEWTON 7.0 - BT400

Bioluminescence detection

PERFORMANCE

Bioluminescence detection : femtogram level

CAMERA & OPTICS

Scientific grade CCD camera
Grade 0, zero defect
400-900nm / 4.8 O.D.
Image resolution: 10 megapixels
Native resolution: 2048x2048

Motorized V.070 lens: f:0.70
Minimum: 10x10cm
Maximum: 23x23cm

ANIMAL MANAGEMENT

BIOSTHESIA gas anesthesia module
Heated table
Choice of animal breather for 1, 3 or 5 mice

HARDWARE CAPABILITIES

Intelligent Darkroom concept
Fully-automatic system

- Motorized optical lens
- Software controlled lighting
- Automatic visible lighting adjustment
- Auto-focus & Auto-exposure

NEWTON 7.0 - FT400

Bioluminescence & fluorescence detection

PERFORMANCE

Bioluminescence detection : femtogram level
Fluorescence detection : picogram level

CAMERA & OPTICS

Scientific grade CCD camera
Grade 0, zero defect
400-900nm / 4.8 O.D.
Image resolution: 10 megapixels
Native resolution: 2048x2048

Motorized V.070 lens: f:0.70
Minimum: 10x10cm
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ANIMAL MANAGEMENT

BIOSTHESIA gas anesthesia module
Heated table
Choice of animal breather for 1, 3 or 5 mice

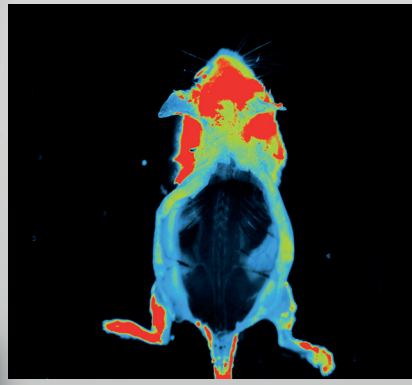
HARDWARE CAPABILITIES

Intelligent Darkroom concept
Fully-automatic system

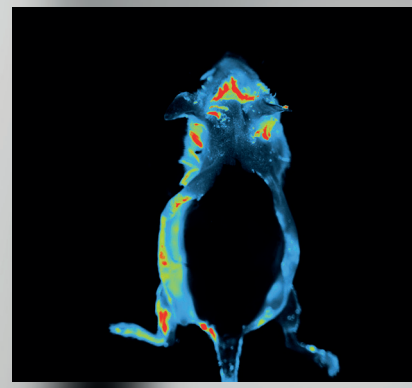
- Motorized optical lens
- Motorized filter wheel
- Software controlled lighting
- Automatic visible lighting adjustment
- Auto-focus & Auto-exposure

ILLUMINATION & FILTERS

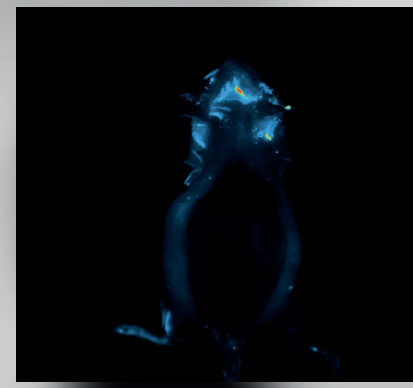
Epi-illumination
6 excitation channels from blue to IR
7 position filter wheel
Large choice of custom made filters



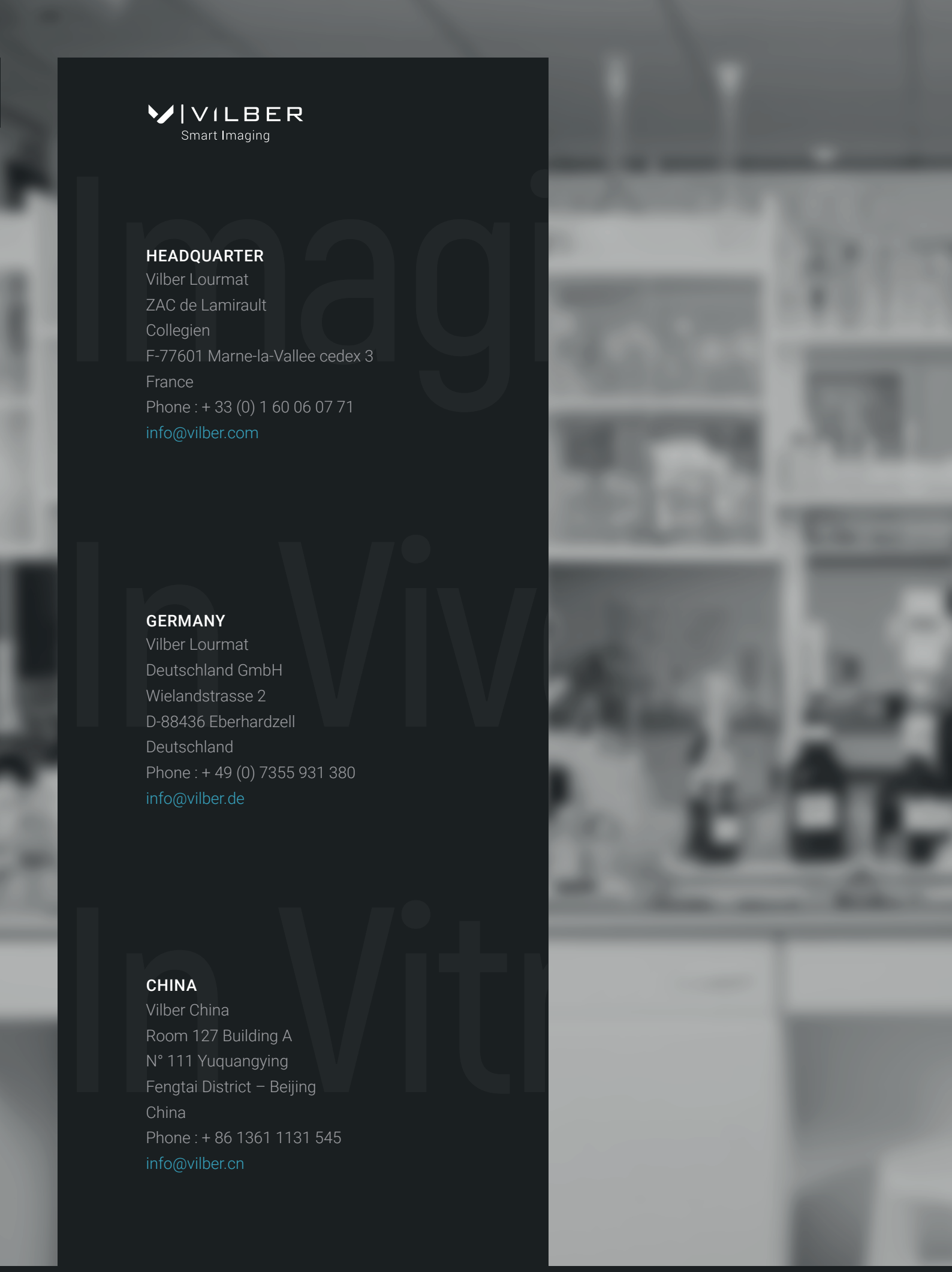
Blue excitation - High autofluorescence



Green excitation - Moderate autofluorescence



Near infrared excitation - Low autofluorescence



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