

IR VIVO™



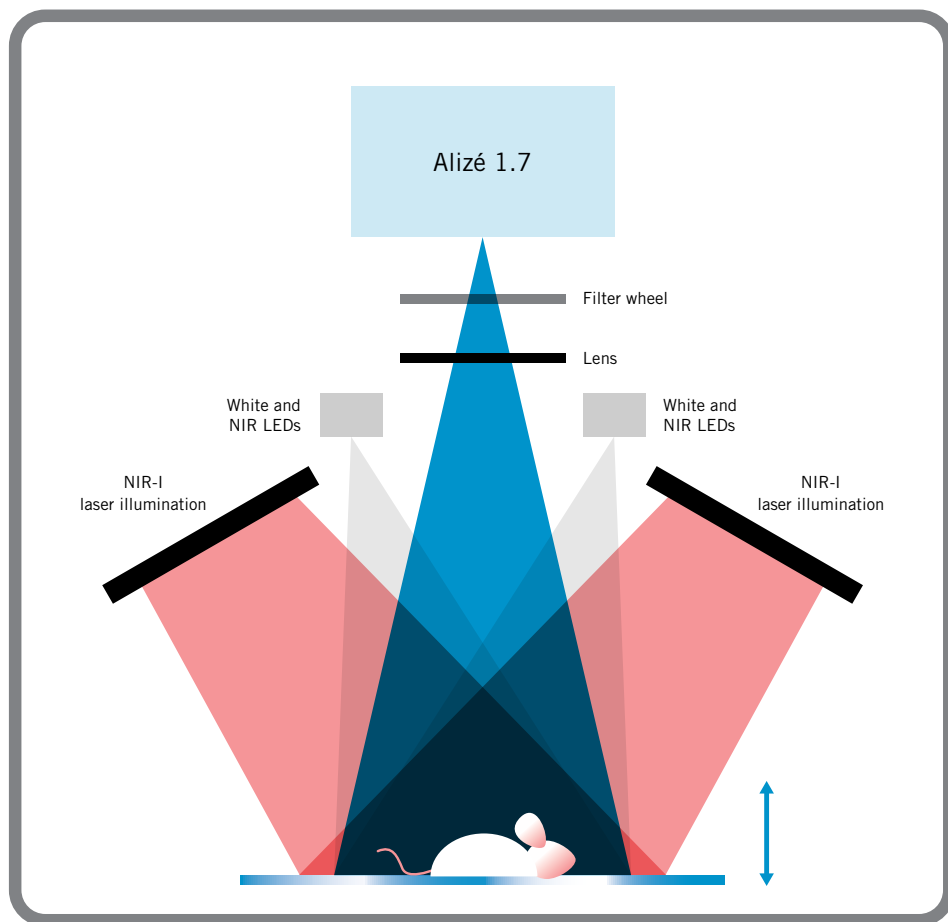
PRECLINICAL IMAGER

IR VIVO is an infrared multispectral platform for small animal in vivo imaging. This system benefits from reduced light scattering, absorption and auto-fluorescence by using a detection system in the first and second near-infrared. This allows for deeper, clearer and more quantitative imaging compared to commercially available in vivo imaging systems. IR VIVO takes advantage of the most recent developments in SWIR imaging with an ultra-low noise InGaAs camera (Alizé 1.7), novel homogeneous illumination and a powerful analytical software to provide an unprecedented combination of fast, high resolution and deep imaging.

IR VIVO™ PRECLINICAL IMAGING SYSTEM OPENS A NEW WINDOW ON LIVING BODIES

TECHNICAL SPECIFICATIONS	
Emission spectral range	900-1600 nm
Filtering	Filter wheel with up to 6 emission channels
Illumination source	Laser at 670, 760, 808 and 890 nm and adjustable power density
Lens	50mm f/1.4 lens
Field of view	80 x 64 mm to 50 x 40mm Variable FOV for 1 mouse or individual organ view
Stage	Manual XY and motorize Z
Dimensions (L x W x H)	Tabletop: 77 x 60 x 98 cm
Stage temperature	Up to 40°C
Anesthetic tubing and nosecone	anesthetic gaz nosecone supplied
Preprocessing	Spatial filtering, statistical tools, data normalization, temporal profile extraction
Single image data format	HDF5, FITS, PNG, JPG
Software	PC (Windows10 - 64-bits) with PHYSpec™ control and analysis software (Computer included)
Power requirement	120 VAC / 6.4A / 50-60 Hz 230 VAC / 3.3 A / 50-60 Hz
Acquisition modes available	Filtered or unfiltered (broadband for reflectance imaging)
CAMERA	
Type	InGaAs (Alizé™ 1.7)
FPA	640 x 512 pixels
Pixel size	15 µm
Quantum efficiency	>70% from 900 to 1600 nm
OPTIONS & ACCESSORIES	
Emission spectral range	Extension available in the visible
Stage	Motorization XY
Additional FOV	156 x 125 mm 3 mice capacity
Spectral probe	For real-time acquisition of spectrum on single point of the image

SCHEMATIC REPRESENTATION OF THE IR VIVO



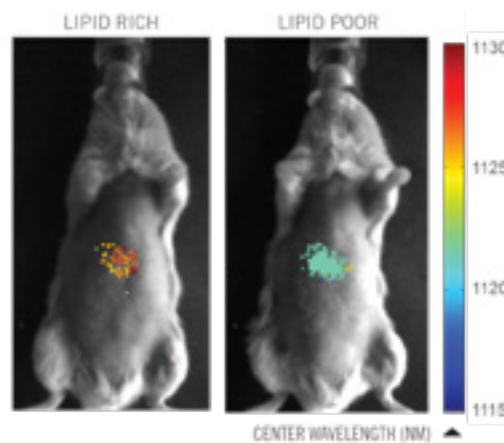
When imaging in the second biological window (NIR-II, from 1000 to 1700 nm) the reduced absorption, scattering and auto-fluorescence results in a much better image contrast, sensitivity, and penetration depth into tissue compared to traditional visible or NIR-I optical imaging (i.e. 400 - 1000 nm). Reaching a penetration depth of up to 3 centimeters has a huge impact when imaging small animals like mice. It opens a new window of possibilities since it allows the visualization of full organs as well as cellular processes in real-time with high spatial resolution.

NIR-II IMAGING APPLICATIONS

- » Visualize microvasculature
- » Identify cancer tissue, guide real-time surgeries
- » Monitor blood flow & metabolic imaging
- » Monitor cell environment (pH, lipid, mRNA)
- » Monitor heart and respiratory rates contact-free

NIR-II IMAGING PROPERTIES

- » High spatial resolution
- » High temporal resolution (real-time dynamics)
- » Non-ionizing & non-invasive
- » Good penetration depth (10x greater than market leading small animal optical imaging systems)



REF: Galassi et al., Sci. Transl. Med., 2018,
DOI: 10.1126/scitranslmed.aar2680