

# IR VIVO™



Using the first (NIR) and second biological window (NIR-II) from 900-1620 nm, Photon etc.'s IR VIVO™ preclinical imager provides multispectral or hyperspectral infrared imaging capabilities for in vivo studies on small animals or living organisms. It combines micron-scale spatial resolution, real-time imaging and full spectral coverage throughout small animals. Emission of several fluorophores can be isolated with a high-efficiency tunable filter and ultra-low noise scientific-grade InGaAs camera.

## PRECLINICAL IMAGER

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

#### TECHNICAL SPECIFICATIONS

Emission Spectral Range	850 - 1620 nm <i>Extension available in the visible up to 400 nm</i>
Filter Types	Multispectral: Filter wheel Hyperspectral: HyperCube™
HyperCube™ Spectral Resolution	< 4 nm
Illumination Source	730, 780, 808 or 810 nm LEDs <i>Other sources available upon request</i>
Illumination Area	15.6 x 12.5 cm field of view for 3 mice model
Field of view	Variable from 5 x 4 cm to 15.6 x 12.5 cm
Overall Instrument Dimensions	Tabletop: 75 x 115 x 75 cm (Expected to change)
Stage Temperature	Up to 40°C
Anesthetic tubing and nosecone	3 mice anesthetic gas manifold supplied
Computer	PC with Windows 7 - 64 Bits
Imaging Software	PHySpec™
Spectral Data Format	HDF5, FITS
Single Image Data Format	HDF5, CSV, JPG, PNG, TIFF
Preprocessing	Spatial filtering, Statistical tools, Spectrum extraction, Data normalization, Spectral calibration
Power Requirement	120 VAC / 12 A / 60 Hz
Acquisition Modes Available	Unfiltered (Broadband)
Video Mode	Megapixel camera for sample visualization

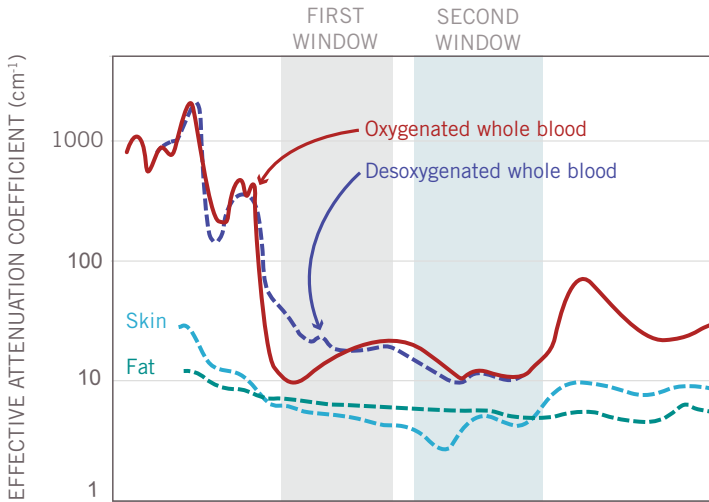
#### CAMERA

Type	InGaAs (ZephIR 1.7™)
FPA	640 x 512 pixels
Pixel Size	15 µm
QE	< 75%
Dynamic Range	13 / 15 bits

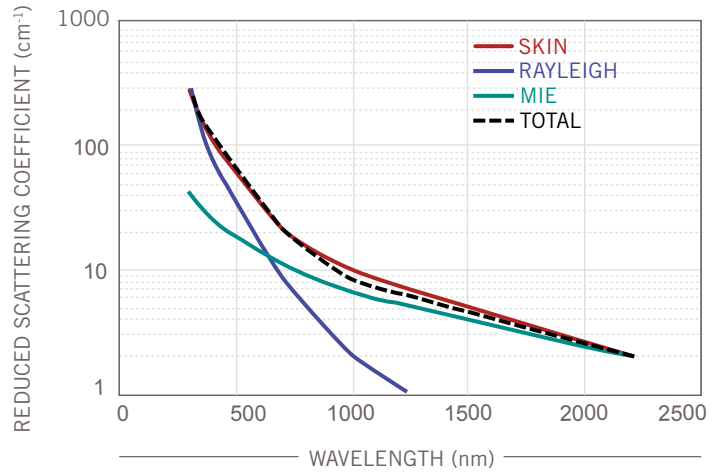
ALLOWS SEEING BOTH **STRUCTURE** AND **FUNCTION** BY COMBINING

- » Fast acquisition speed
- » Micron-scale spatial resolution
- » Centimeter-scale penetration depth
- » Multicolour imaging

## BIOLOGICAL WINDOWS IN LIVING TISSUES



## LIGHT SCATTERING FROM SKIN (INVERSELY RELATED TO IMAGE CLARITY)



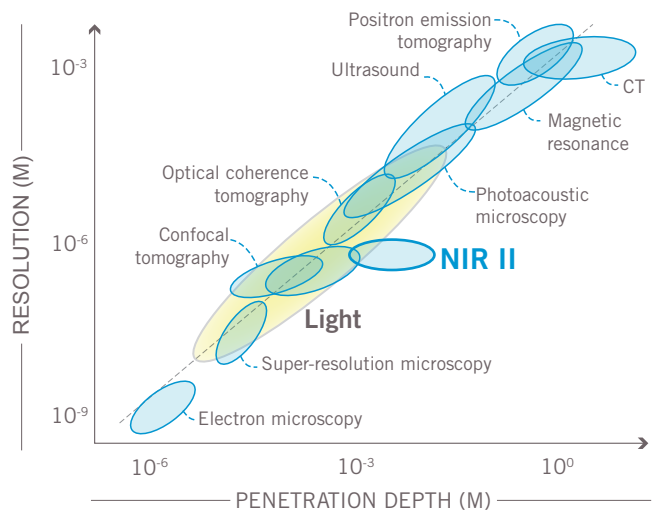
## EXAMPLES OF NIR II IMAGING APPLICATIONS

- » 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 IN PERSPECTIVE

Modality	Source	Resolution	Depth	Sensitivity	Time
MRI	Radio Wave	10-100 $\mu\text{m}$	No limit	$10^{-9}$ , $10^{-6}$	Minutes to hours
CT	X-ray	50-200 $\mu\text{m}$	No limit	$10^0$	Minutes
PET	Y-ray	1-2 mm	No limit	$10^{-15}$	Minutes to hours
NIR II	Light	$>0.6 \mu\text{m}$	<b><math>\sim 3 \text{ cm}</math></b>	$10^{-12}$	Subseconds to minutes
Visible	Light	$>0.3 \mu\text{m}$	<b><math>\sim 3 \text{ mm}</math></b>	$10^{-12}$	Subseconds to minutes

The penetration depth depend on the sample properties.



## OUR DISTRIBUTORS

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