Solaris

PRODUCT NOTE

Pre-clinical *in vivo* imaging

Key Features:

- Open-air fluorescence imaging for large and small animals
- Operates in ambient light
- Broad-range spectrum (470 – 800 nm)
- Multiplex Imaging with four fluorescence channels
- Supports broad range of fluorescent dyes
- Fluorescence and color overlay of real time video or images
- Surgical-grade white-light and fluorescence excitation illuminators
- Medical grade display monitors
- Intuitive, easy to use tablet interface

In Vivo Imaging Out in the Open

Solaris™ open-air fluorescence imaging system is a high impact research tool that enables translational in vivo preclinical imaging. Solaris is a multispecies imaging system designed for use with a broad spectral range of fluorescent probes enabling versatility in imaging application development and surgical research.

Solaris is designed for multispecies preclinical, translational and emerging veterinary surgical research applications. The system is extremely flexible to fit the needs of invasive, intra-operative and superficial, non-invasive fluorescence imaging. The system enables multiple imaging applications of preclinical research, including oncology, inflammation, cardiovascular disease, dentistry, vaccine development and drug discovery.

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For the Better

Figure 1. Representation of the Solaris Imaging system. 1. Tablet control system with touchscreen interface. 2. Single handed adjustment for positioning the imaging head. 3. Surgical grade white light and fluorescence excitation illuminators

The Solaris system is user-friendly and flexible for broad spectrum fluorescence imaging. Fluorescence and color overlay of real time video or higher sensitivity single images allows for easy localization of fluorescently labeled tissue.

The system is operated by a tablet for a simple, optimized workflow to maximize ease-of-use and maintain focus on animal handling. The fluorescence image can be overlaid over the color image or kept side by side depending on user preference. The fully adjustable imaging head and articulated arm enable fine positioning for more flexible animal handling.

Illumination Technology

Solaris offers advanced illumination and imaging technology coupled in one instrument. The system is equipped with surgical grade white light and fluorescence excitation illuminators for broad spectrum fluorescence imaging from visible to near infra-red wavelengths. The imaging subject is illuminated from 10 different angles for shadow control in ambient light. The Liquid Crystal Tunable Filter (LCTF) technology is utilized for autofluorescence reduction and spectral unmixing in the 470 nm channel.

Fluorescence Imaging Agents

Solaris is optimized to image PerkinElmer's entire portfolio of biomarker targeted or activatable imaging agents including IntegriSense™, ProSense®, BombesinRSense™, and MMPSense®. In addition the system can be used to image commonly used dyes such as FITC and ICG for preclinical research applications.

Imaging Validation with Bioluminescence Imaging

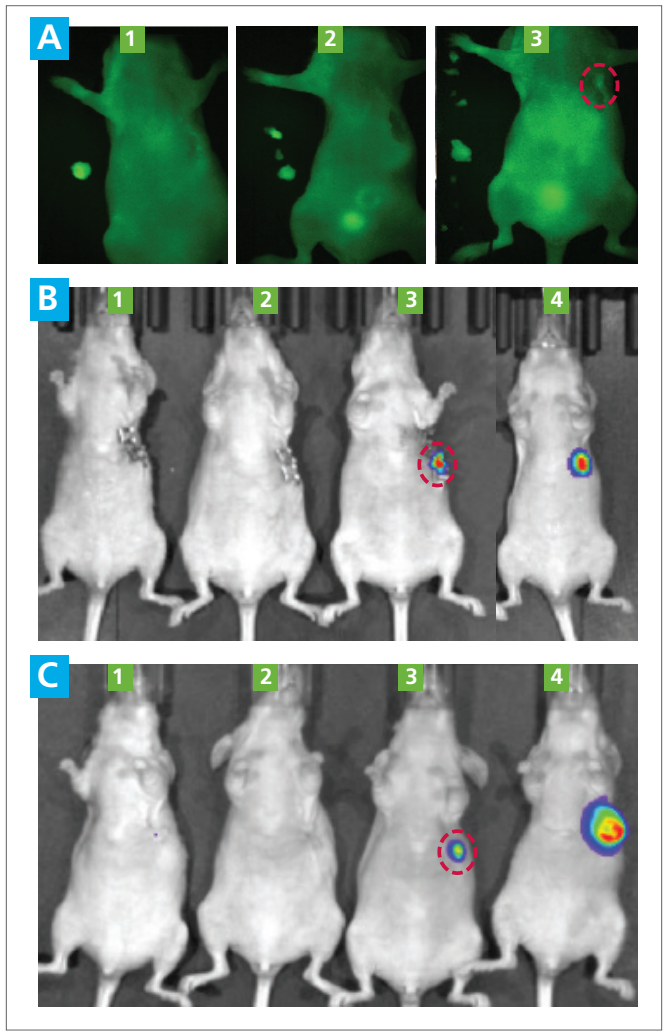

Figure 2. (A) Post guided surgery images and resection of tumors. Images show mouse #3 has a portion of the tumor not resected - confirmed by bioluminescence imaging. (B) 10 days post surgery the mouse, whose tumor was not resected completely shows regrowth. (C) Mouse # 4 was control mouse where primary tumor was not resected.

Real-Time Visualization of Image Guided Surgery of HCT-116 Metastatic Colorectal Tumors

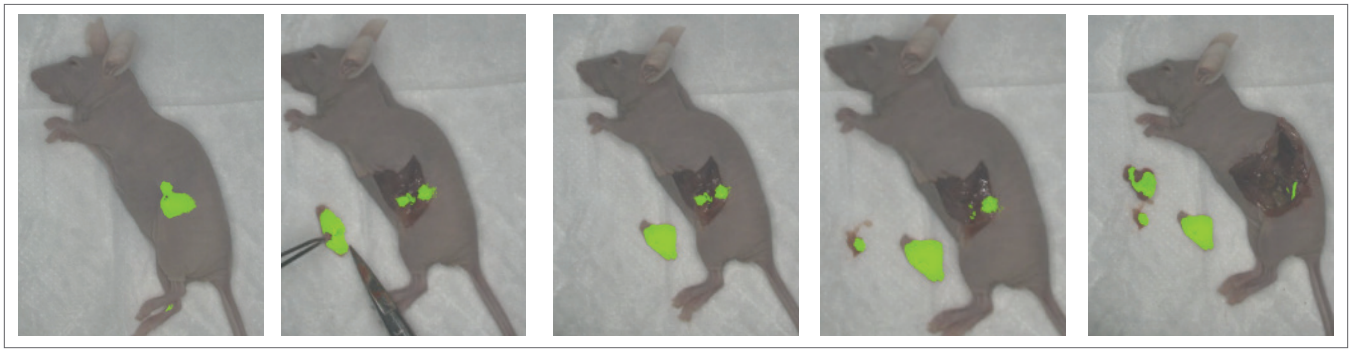

Figure 3. HCT-116 colorectal carcinoma, direct intrasplenic injection of 100,000 cells. PerkinElmer fluorescent imaging agent IntegriSense 680 (2 nmol) was injected i.v. and tumors were resected 24 hour post agent injection.

Key Research Applications

- **Oncology:** Primary tumors, metastases in Xenograft and Genetically Engineered Mouse(GEM) mouse models, rat models, and intraoperative tumor detection in canines, felines and primates
  - Imaging Biomarkers: IntegriSense, MMPSense 750 FAST, FolateRSense™, HER2Sense™, Annexin-Vivo™ 750, ProSense, Transferrin, BombesinRSense, AngioSense, OsteoSense
- **Atherosclerosis:** Intraoperative rabbit and primate carotid models
  - Imaging biomarkers: ProSense 750, Cat B Fast™ 750, IntegriSense, MMPSense 750 FAST
- **Rheumatoid Arthritis, Osteoporosis:** Detection of inflammatory processes and bone resorption (rat and rabbit models) and superficial joints in larger species.
  - Imaging biomarkers: MMPSense 750, IntegriSense 750, ProSense 750, Cat B 750 FAST, OsteoSense®
- **Device Imaging**
  - Biofilm imaging, catheters and implants
- **Vaccine development** (non-human primate models)
  - Imaging biomarkers: Fluorescently labeled antibodies
- **Safety and Pharmacology of new Therapeutics:**
  - Drug-induced vascular injury and liver injury (rat, canine and monkey models).
    - Imaging biomarkers: MMPSense 750 FAST, AngioSense 750, Annexin-Vivo
  - PK and PD for fluorescent labeled therapeutics
- **Fluorescence guide Injection:**
  - Stem cells, fluorescent agents

Solaris	Technical Specifications
Color CMOS camera	4.1 MP, 5.5 mm pixel pitch
Fluorescence sCMOS camera	5.5 MP, 6.5 mm pixel pitch
Working distance	~75 cm
Imaging FOV's	10 cm (full field) and 5 cm (high resolution)
Smallest resolvable feature	100 micron
Fluorescence sensitivity (video)	<100 nM
Fluorescence sensitivity (single image)	<10 nM
White light illuminated FOV	~20 cm
White light uniformity across imaging field:	<25% variation within imaging FOV
White light color temperature	~3000 K
White light brightness	>40,000 lux
Depth of focus in color image	2 cm
Imaging head adjustability	3 DOFs
Arm adjustability	3 DOFs
Display monitors	Dual medical grade monitors on adjustable arms
Acquisition workstation	64-bit high capacity, high performance hard drives USB 3.0 and GigE external connections
General safety compliance	CE and TUV

General Instrument Specifications
Dockable tablet-based instrument control and image display
Movable system with lockable casters
Uninterruptable power supply for limited duration

Technical Features
Four fluorescence imaging channels (470, 660, 750, 800 nm) with both video and single image modes
Independent and/or overlaid fluorescence and color images
Digital zoom
Autofocus for both white light and fluorescence images
Ambient light rejection based on spectral filtering and temporal image processing
Autofluorescence reduction using LCTF and spectral unmixing for single images on 470 nm channel
ROI based analysis of fluorescent signals
Illumination from 10 different angles for shadow control

For research use only. Not for use in diagnostic procedures.

For more information, please visit www.perkinelmer.com/solaris

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