FUJIFILM

Life Science

LUMINESCENT IMAGE ANALYZER

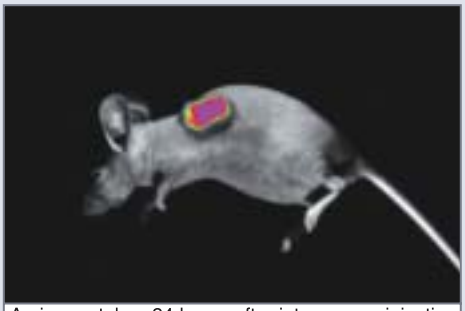
LAS-4000

The analyzer can be customized for detection methods selected from chemi/bioluminescence detection and a wide range of fluorescence detection by various light sources.

In addition to red, green and blue, near-infrared (IR) and ultraviolet (UV) epi-illuminators light sources are now available for your selection. The increased range of applicable reagents has expanded available applications. Near-infrared light, which is easily transmitted through tissues, enables high-sensitivity and high-resolution in-vivo imaging of small animal samples such as mice.

A free combination of light source options.

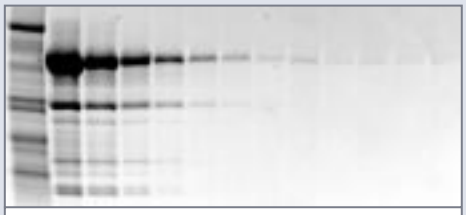
Multipul LED / IR, Red, Green, Blue, UV



An image taken 24 hours after intravenous injection of DY676-labeled antibody

Imaging parameters		
	Light source	: IR LED epi-illuminator
	Filter	: IR785
	Exposure time	: 10 seconds

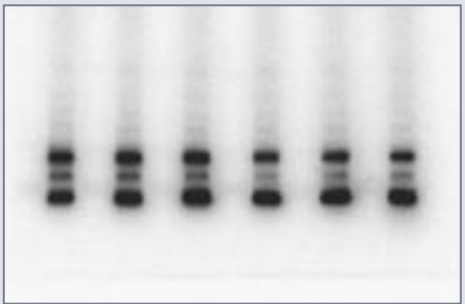
Multipul LED / Red, Green, Blue



Fluorescence detection of proteins by SYPRO®Ruby

Imaging parameters		
	light source	: blue LED epi-illuminator
	filter	: Y515
	exposure time	: 3 seconds

Mono LED



Chemiluminescence detection of proteins by ECL Plus™

Imaging parameters		
	light source	: none
	filter	: none
	exposure time	: 60 seconds

Easy, rapid and sophisticated imaging with high sensitivity

The top-end model of the reliable, high-resolution LAS series has been designed more user-friendly than ever.

Remote control from a computer

Focus and diaphragm can be easily and rapidly controlled from the computer. By storing the imaging parameters employed at the previous detection, it saves on the time required for setting the parameters.

Quicker response to reduce stress

The system supports USB2.0 offering a high data-transfer rate. Quicker response to computer operation alleviates stress and improves efficiency.

Easy filter exchange

A filter changer mounted below the lens area can hold up to 4 filters at once. Filter selection can also be done from a computer.

User-friendly image capture software "LAS-4000 Image Reader" Mac® OS X 10.4.4 or later / Windows® XP Pro SP2 compatible

The self-explanatory and user-friendly software allows specification of all image capture parameters, including sensitivity, resolution and image methods. The software automatically carries out all image correction functions. In increment mode, the signal increase is shown in real time, by capturing and automatically displaying up to 16 images. With this software users can create their own settings and methods. A photograph of the sample can be made and overlaid with the signal image.


Method/Tray position Screen


Exposure Increment Screen

Large-aperture F0.85 lens

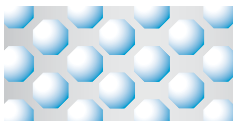
The analyzer incorporates a FUJINON, a strikingly bright lens with an F-number of 0.85. This lens has been especially designed to make full use of the advantages of Fujifilm's proprietary Super CCD chip, and is excellent for capturing images from distances as short as several tens of centimeters. In its design, optical expertise developed through professional applications such as broadcasting TV cameras lens is fully incorporated.


FUJINON LENS VRF43LMD3 F0.85

CCD affording up to 6.3 megapixels

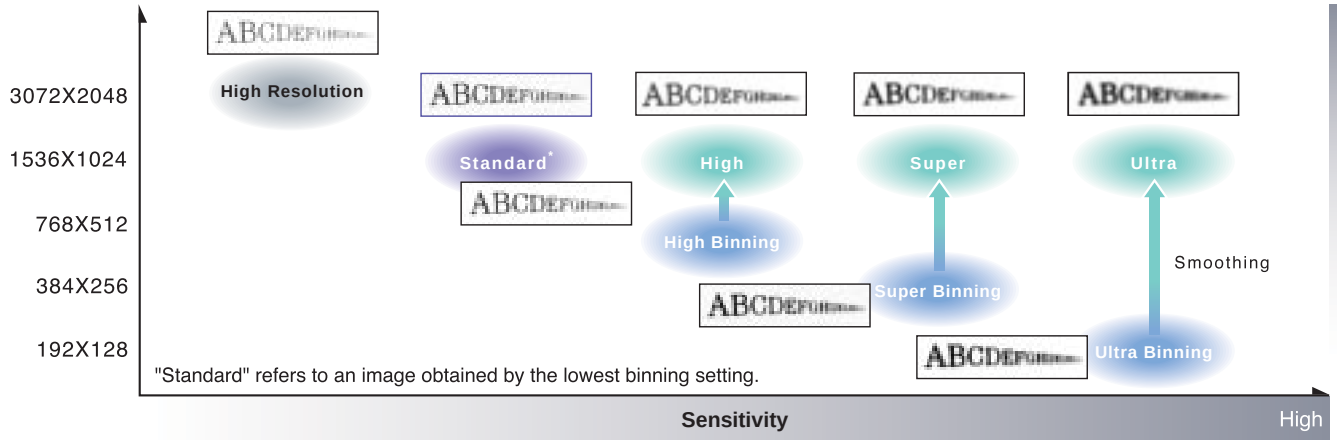
By rotating pixels 45 degrees to form an interwoven layout, the Super CCD's pixel pitch in the horizontal and vertical directions is narrower than in the diagonal direction, achieving higher horizontal and vertical resolution. This unique pixel layout design allows an image resolution with virtual 6.3 megapixels can be acquired by the Super CCD despite its real 3.2 megapixels.

Super CCD chip


Octagonal pixel-interwoven layout

Binning function enabling sensitivity improvement and smoothing

The four-stage binning function enables sensitivity improvement by one or more digits.
The resulting grainy image can be smoothed by selecting the smoothing mode.



A free combination of light sources can be incorporated into the analyzer according to your needs.
For example, the analyzer can be customized exclusively for luminescence detection, or for a wide range of fluorescence detection such as IR, UV.
Five epi-illuminator options (IR, red, green, blue and UV LEDs) and two transilluminator options (white and UV illuminators) are available.

◎Each epi-illuminator unit (IR, red, green, blue and UV) includes a white epi-illuminator. White epi-illuminator is included in all color illuminators.
◎The following models represent typical examples of light source combination. Any other combination is also available.
◎Light source types: Epi = incident light source, Dia = transmitted light source.

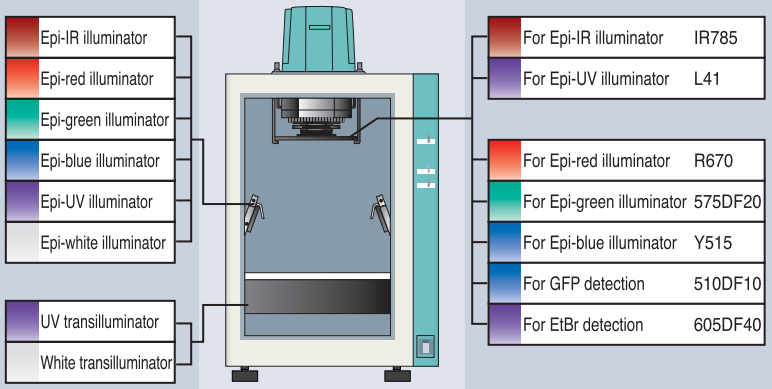
Light source | Filter | Detection method

Example combination 1

An all-rounder, covering from chemi/bioluminescence to in-vivo imaging.

IR, Red, Green, Blue, UV

Incorporates a full range of epi-illuminators, including "IR" and "UV" as well as "red/green/blue". Offers a wider range of fluorescence detection applications, such as in-vivo imaging using an IR illuminator.



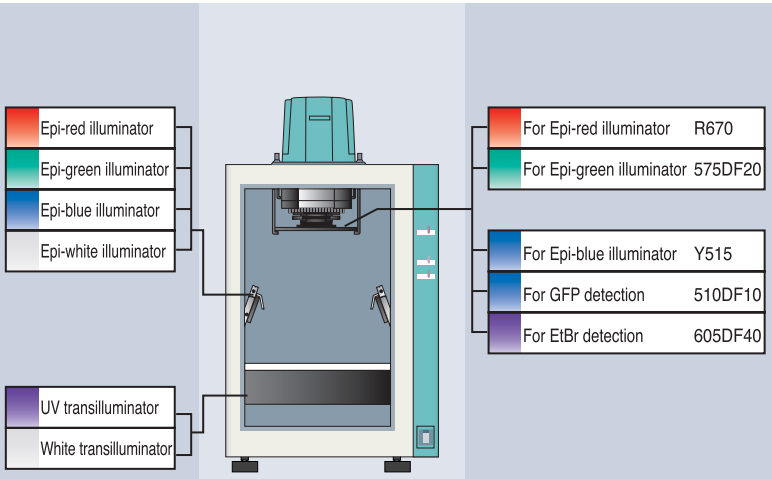
Luminescence
Chemiluminescence | Bioluminescence
Fluorescence
IR epi-illumination | Red epi-illumination
Green epi-illumination | Blue epi-illumination
UV epi-illumination | Trans-UV
Digitizing
White epi-illumination | White transillumination

Example combination 2

A multipurpose detector, covering from luminescence to RGB fluorescence.

Red, Green, Blue

Has satisfactory performance, function and total balance for accomplishing general imaging requirements, including chemi/bioluminescence detection, fluorescence detection by "red/green/blue" multicolor light sources and digitizing.



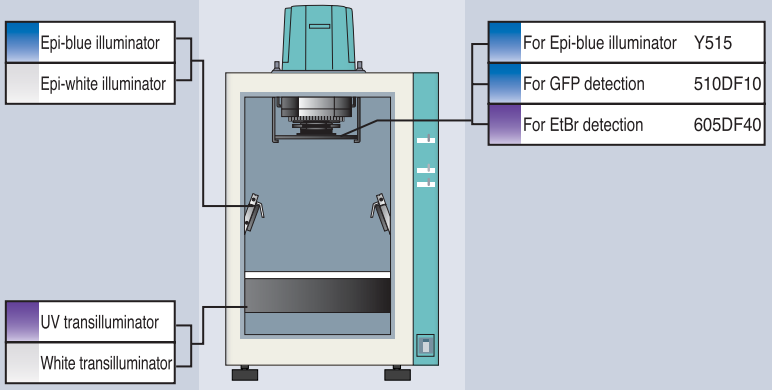
Luminescence
Chemiluminescence | Bioluminescence
Fluorescence
Red epi-illumination
Green epi-illumination | Blue epi-illumination
Trans-UV
Digitizing
White epi-illumination | White transillumination

Example combination 3

A single light source system focusing on chemi/bioluminescence detection.

Blue

A basic model with superior cost performance, optimized for those mainly performing chemi/bioluminescence detection. Incorporates blue epi-illuminator and UV transilluminator as light sources for fluorescence detection and is also capable of digitizing by white illuminator.



Luminescence
Chemiluminescence | Bioluminescence
Fluorescence
Blue epi-illumination
Trans-UV
Digitizing
White epi-illumination | White transillumination

Ultraviolet Blue Green Red Near-infrared

Applicable reagents

Luminescence

ECL™	ECL Plus™	ECL Advance™
Lumi-Light Plus	SuperSignal®	CDP-Star®
CSPD®	Immobilon	Bright-Star™

Fluorescence/IR

DY676	DY781
Alexa Flour® 680	Alexa Flour® 700

Fluorescence/red

Alexa Flour® 633	Alexa Flour® 635	Alexa Flour® 647
Cy™ 5	BODIPY® 650/665	DiD
TOTO® -3	DDAO phosphate	

Fluorescence/green

SYPRO® Red	Cy™ 3	TAMRA™
ROX™	HEX™	Alexa Fluor® 532
Alexa Fluor® 546	Deep Purple	Pro-Q® Diamond
Rhodamine Red™	BODIPY® 576/589	NED™
R-phycoerythrin	RFP	HNPP
Tetramethylrhodamine		

Fluorescence/blue

SYBR® Green I	SYBR® Green II	SYBR® Gold
SYPRO® Ruby	SYPRO® Orange	SYPRO® Tangerine
FITC	FAM™	EGFP
ECFP	AttoPhos™	

Fluorescence/epi-UV

Ethidium Bromide	SYPRO® Rose	Qdot®

Fluorescence/trans-UV

Ethidium Bromide

Digitizing/white epi-illumination/white transillumination

Silver staining	CBB	NBT/BCIP
X-ray film, etc.		

*** The reagents listed above are representative reagents with high performance results. Please contact us for other reagents.**

Bioimaging by near-infrared light (using epi-IR/white LED)

A tumor in nude mouse was detected by antibody* labeled with DY676, a near-infrared fluorescent dye. The image was obtained 24 hours after antibody intravenous injection. The near-infrared fluorescence image was overlapped with the digitized image and analyzed using standard analysis software.

*antibody : an antibody directed against a human cancer cell surface marker was supplied by Perseus Proteomics Inc.

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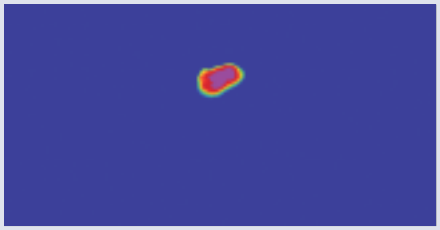
Near-infrared fluorescence image



Near-infrared fluorescence detection of DY676-labeled antibody distribution.

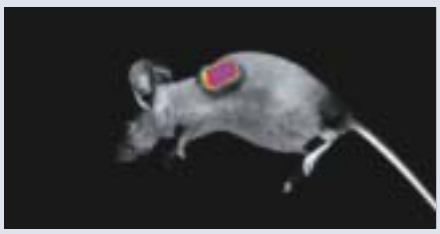
Light source: epi-IR illuminator	Filter: IR785	Exposure time: 10 seconds

Digitized image

Digitized image of a living mouse

Light source: epi-white illuminator	Filter: none	Exposure time: 0.01 seconds

Overlapped image

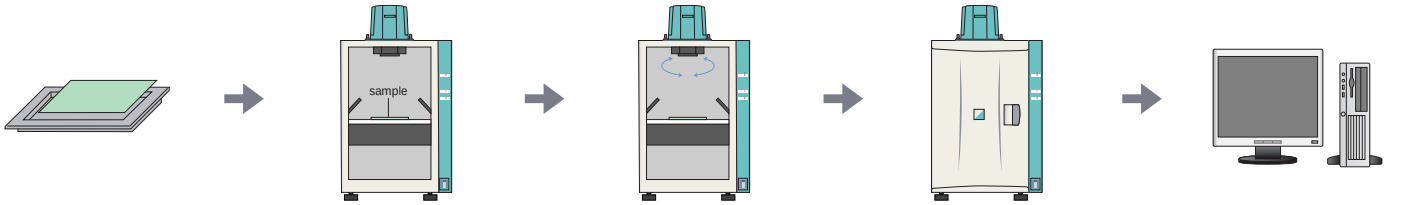


The two images were overlapped using "MultiGauge (Science Lab)" to enable easy quantitative analysis of DY676-labeled antibody distribution.

External cable/tube insertion port

The analyzer has a port for inserting temperature adjustment/anesthesia cables and tubes.

Analysis procedures using LAS-4000



Place sample on the tray | Load the tray | Remote focusing | Exposure | Analysis

Specifications and Configuration

Image Capturing Unit (Requires additional Analyzing Unit)

- **Camera head**

CCD chip	: Fujifilm Super CCD Area Type chip(15.6 x 23.4mm)
Number of pixels	: 3.2 million pixels
Pixel size	: Approx. 11 μm
Cooling	: Two-stage thermoelectric module with air circulation
Cooling temperature	: Down to -30℃ (When room temperature is below 28℃.)
Dynamic range	: Four orders of magnitude
Focusing and diaphragm	: Automatic, remote operation
Gradation	: 16 bits
Exposure mode	: Automatic / manual (normal / incremental / repetitive / program / invivo)
Exposure time	: Automatic / manual (1 / 100 seconds to 30 hours)
Pixel correction	: Dark-frame correction, flat-frame correction, distortion correction, etc.
Image quality correction	: Binning and smoothing
Image size	: Up to 12 MB (formats : FUJI and TIFF)
Read pixel size	: Down to 35 μm
Maximum sample size	: 21 x 14 cm (25 x 25 cm when using a wide-view lens)
Interface	: USB 2.0

- **Intelligent Dark Box Set**
  Includes; IDX box, Epi-tray, USB Cable.
- **Lens**
  High-sensitivity lens : FUJINON Lens VRF43LMD 3
  SIGMA Wide-view Lens is also available.
- **Operating conditions**

Line frequency	: 50 - 60 Hz
Temperature	: 15 - 28 ℃
Humidity	: 30 - 70% (no condensation)
Supply Voltage	: 100 - 240V
Power Consumption	: Approx. 0.3 kVA

- **Dimensions**
  Camera head and dark box : 510 (W) x 900 (H) x 480 (D) mm

Optional Products*

- **UV 2020 Transilluminator set**
  Includes; UV Transilluminator(312nm), Gel sheet, UV Dia-tray, 605DF40 filter.
- **White Transilluminator(470~740nm) set**
  Includes; White Trans-illuminator, White Dia-tray
- **Epi-Blue Illuminator set**
  Includes; Epi-Blue(460nm) / White Illuminator, Y515 filter.
- **Epi-Green Illuminator set**
  Includes; Epi-Green(520nm) / White Illuminator, 575DF20 filter.
- **Epi-Red Illuminator set**
  Includes; Epi-Red(630nm) / White Illuminator, R670 filter.
- **Epi-IR Illuminator set**
  Includes; Epi-IR(710nm) / White Illuminator, IR785 filter.
- **Epi-UV Illuminator set**
  Includes; Epi-UV(365nm) / White Illuminator, L41 filter.
- **UV Dia-tray set**
  Includes; UV Dia-tray, Gel sheet
- **Non-parallax tray**
- **Optical Filter: Y515**
  510DF10 for GFP detection
  605DF40 for EtBr detection
- **Filter changer**

* Each light source set includes filter(s) for the corresponding wavelength range(s).
The three optional filters can be purchased individually.

Analyzing Unit (separate product)

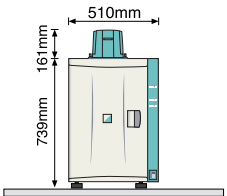
- **Computer**
  OS : Mac® OS X 10.4.4 or later
  Windows® XP Pro SP2
- **Analysis software** : ScienceLab

Remarks

- **Gel documentation is available by digitizing**
- An optimum system for meeting your needs can be constructed by freely combining a wide array of options with the basic model*

* Basic model: Camera Head + Intelligent Dark Box set + Lens

< Image capturing unit >



- The desk is not included.
- The maximum depth is approximately 500 mm.
- The figure above represents a model loaded with the UV illuminator .

< Analyzing unit >

- excitation light source units*
  blue LED epi-illuminator, green LED epi-illuminator, red LED epi-illuminator, ultraviolet (UV) LED epi-illuminator, near-infrared (IR) LED epi-illuminator

* Each of the epi-illuminator units for different wavelengths includes a white epi-illuminator.
White epi-illuminator is included in all color illuminators.

- various filters
  510DF10* for GFP detection, Y515* for yellow or red fluorescence detection, 605DF40* for EtBr detection, 575DF20 for orange fluorescence detection, R670 for dark red fluorescence detection, IR785 for IR detection, L41 for visible fluorescence detection

* available as options also

http://lifescience.fujifilm.com

LAS-4000 (with any Epi-illuminator) is categorized as the class 1 laser (LED) (IEC60825-1+A2:2001).

Notice: With regard to patents owned by third parties related to, among other things, sample preparation, we recommend that you consult with a lawyer or patent attorney about obtaining a license from the third parties.

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