



ODYSSEY[®] Fc

IMAGING SYSTEM

ONE SYSTEM, TWO DETECTION METHODS
INFRARED FLUORESCENCE AND CHEMILUMINESCENCE



QUANTITATIVE, TWO-COLOR WESTERN BLOTS

CHEMILUMINESCENCE DETECTION

WIDE LINEAR DYNAMIC RANGE

NO FILM OR DARKROOM

ONE-BUTTON IMAGE ACQUISITION

LI-COR[®]
Biosciences



ODYSSEY[®] Fc

IMAGING SYSTEM



The Only System that Offers Superior Infrared *and* Chemiluminescence Detection

The Odyssey Fc System offers unique advantages for both infrared fluorescent and chemiluminescent Western blot detection. The Odyssey Fc Imager is the newest member of the Odyssey Imaging System family of imagers, which continue to set new standards for quantitative Western blot analysis. The Odyssey Fc System allows your lab to combine the proven advantages of quantitative infrared fluorescence detection with simple, streamlined, qualitative chemiluminescence detection on one instrument.

Introducing FieldBrite™ XT Technology

Set aside traditional thinking about CCD detectors: the Odyssey Fc System introduces new laser-based detection technology that acquires images with uniform field illumination and without saturated pixels on the first attempt. With the Odyssey Fc System there is no need for software corrections such as field flattening and you don't have to change filters, adjust the focus, or super-cool the camera.

Quantitative, Two-Color Western Blots

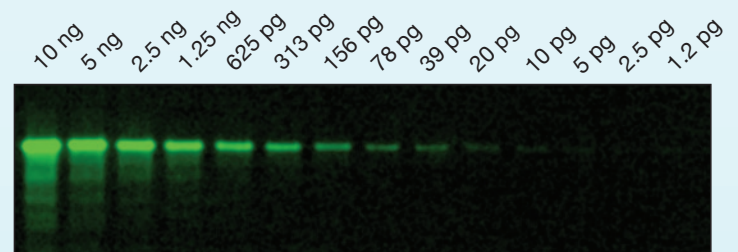
Chemiluminescence Detection

Wide Linear Dynamic Range

No Film or Darkroom

One-Button Image Acquisition

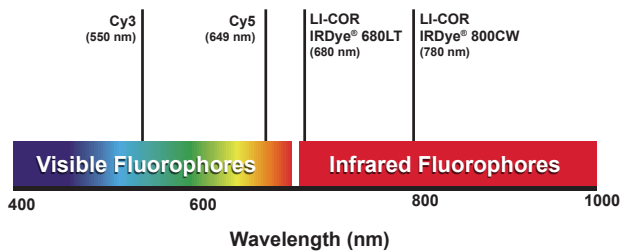
High Sensitivity and Wide Dynamic Range



Strong and weak bands are accurately detected in a single image without signal saturation. Serial dilutions of purified transferrin (10 ng to 1.2 pg) were detected with rabbit anti-transferrin and IRDye[®] 800CW secondary antibody. Acquisition time with the Odyssey Fc Imager was 2 minutes.

Unique to the Odyssey Fc Imager is a one-button image acquisition system, featuring new FieldBrite XT technology, that quickly acquires infrared fluorescent and/or chemiluminescent images uniformly over the widest reported system dynamic range in the industry, with minimal user adjustments.

The Odyssey Fc System features two-channel infrared fluorescence detection (700 and 800 nm) plus a third detection channel for chemiluminescence. This provides the two-channel, multiplex detection that is well known to Odyssey users and eliminates the need for a darkroom.



The Infrared Fluorescence Advantage

Infrared fluorescence detection provides **quantitative** analysis and wide linear dynamic range that is not available with traditional methods. Only the Odyssey family of imagers detects

strong and weak bands on the same blot without worrying about fuzziness, blowouts, or hidden bands. You can detect two targets simultaneously on the same membrane to increase the accuracy of quantification and comparison using multiplex imaging on the Odyssey System.

At the 700 and 800 nm infrared wavelengths detected by the Odyssey Fc Imager, both autofluorescence and light scatter are dramatically reduced. Emission signals are captured in this near-infrared 'sweet spot,' resulting in the cleanest background, highest signal-to-noise ratios, and the best detection sensitivity available with a fluorescent system.

The Fc Chemiluminescence Advantage

First, you eliminate film and the time spent in the darkroom doing multiple exposures in order to "get the best image." The Odyssey Fc System offers flexibility rather than guesswork for chemiluminescence detection. You also avoid the accompanying mess and hazardous waste of film development. Plus, the Odyssey Fc System, using FieldBrite XT technology, delivers uniform imaging across the field of view and consistent image quality without the blowouts or saturation that can occur with film or other chemiluminescence imaging systems.



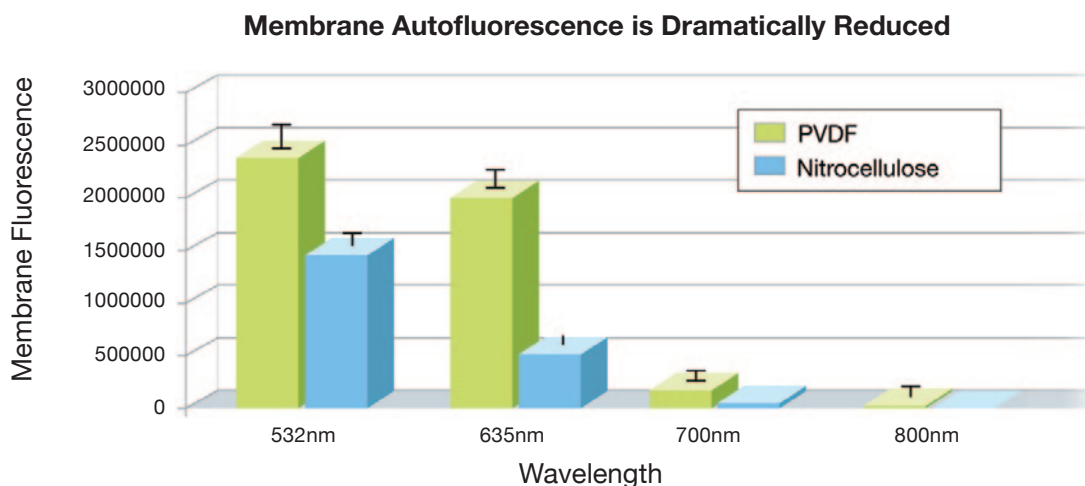
The Odyssey Fc System is the practical solution to improve your Western blot workflow, whether you use infrared fluorescence or chemiluminescence detection. The Odyssey Fc System adapts to the demands of your lab and offers:

- One-button image acquisition
- Superior image quality
- Detection method flexibility
- Powerful analysis software

Why Infrared Fluorescence?

Unique to all Odyssey® platforms is the use of infrared laser excitation that out-performs visible fluorescence systems. In the visible wavelength range used by most fluorescence imagers, membranes and plastics produce high background due to light scattering and autofluorescence. This limits the sensitivity of

visible fluorescence systems and makes it difficult to detect low-abundance proteins at endogenous levels without saturation of stronger bands.



Nitrocellulose and PVDF membranes were imaged with the Odyssey Infrared Imaging System at an Intensity = 5 for both 700 and 800 nm wavelengths. The same membranes were scanned at a 532 nm and 635 nm wavelength with a PMT = 500 on a GenePix® 4100A (Molecular Devices). **Autofluorescence was much lower at infrared wavelengths.**



The Odyssey Family

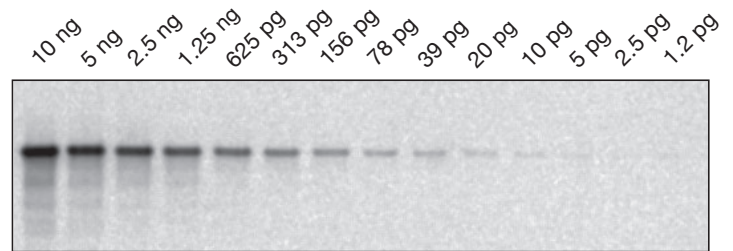
The Odyssey family includes the Odyssey Infrared Imaging System, which continues to set the standard for quantitative Western blot analysis while providing versatility for a wide variety of membrane, gel, microplate, and *in vivo* applications. The Odyssey Sa Imager is designed to handle Western blots and microplate assays, such as In-Cell Western™ Assays with optional walk-away automation. The new Odyssey Fc Imager is the only system that offers superior infrared quantitative fluorescent Western blot imaging and chemiluminescence on the same platform.

Quantification with Confidence

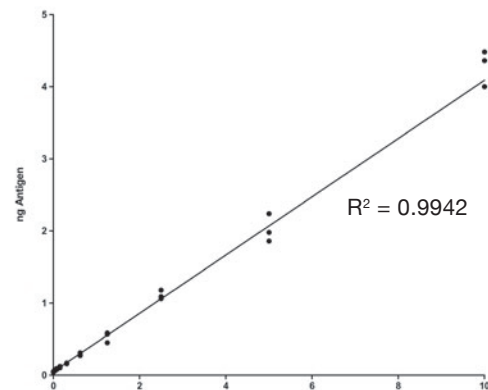
Through the innovative use of infrared fluorescent antibody conjugates, the Odyssey® Fc Imager provides a broad, linear dynamic range to accurately detect both strong and weak bands on the same Western blot. In contrast, the dynamic enzymatic nature of chemiluminescence allows you to capture only a “snapshot” of the enzymatic reaction and is highly dependent on timing and exposure.

The accuracy and linearity of fluorescence detection on the Odyssey Fc System allow you to feel confident about differences you see in protein levels. And your near-infrared fluorescent blots can be archived then imaged, and quantified again months later, if needed.

Wide Dynamic Range for Accurate Quantification



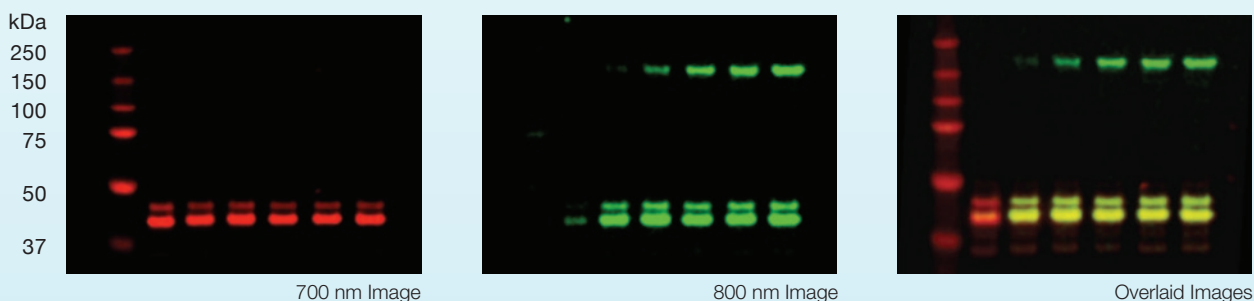
The unusually wide dynamic range allows precise quantification of both strong and weak bands, to more accurately reflect protein levels. Serial dilutions of purified transferrin (10 ng to 1.2 pg) were detected with rabbit anti-transferrin and IRDye® 800CW secondary antibody. Acquisition time with the Odyssey Fc Imager was 2 minutes. Triplicate blots were performed.



Fluorescent signals on the triplicate blots were quantified with Image Studio software. Errors bars are shown, but are very small. **Results were linear across the entire range tested** (4,000-fold; 3.6 orders of magnitude).

Multiplex Western Detection: More Data, Improved Accuracy

The two infrared fluorescence detection channels of the Odyssey Fc System enable two-color target analysis – an advantage that’s not available with chemiluminescent or radioactive methods. Two-color Western analysis makes normalization easy and eliminates error introduced by stripping and reprobing or by comparison of separate blots. Superior image clarity and detail allow you to resolve co-migrating proteins and make it easier to detect subtle mobility shifts caused by protein modifications such as phosphorylation.



Detect Two Targets and Monitor Protein Phosphorylation. Lysates (10 µg/well) of A431 cells treated with EGF were separated and transferred to nitrocellulose. The blot was probed with rabbit anti-ERK1 and mouse anti-phospho-ERK primary antibodies (Santa Cruz Biotechnology) and then detected with goat anti-rabbit IRDye 680 (red) and goat anti-mouse IRDye 800CW (green) secondary antibodies, respectively. The blot was imaged with the Odyssey Fc Imager for 2 minutes in each channel. Overlapping ERK (red) and phospho-ERK (green) signals are displayed in yellow. This phospho-ERK1 antibody cross-reacts with phospho-EGFR (upper green band).

Chemiluminescence

For qualitative chemiluminescent Western blot detection, the Odyssey® Fc System saves you time and eliminates the guesswork of multiple exposures as well as the expense and hazardous waste of film processing.

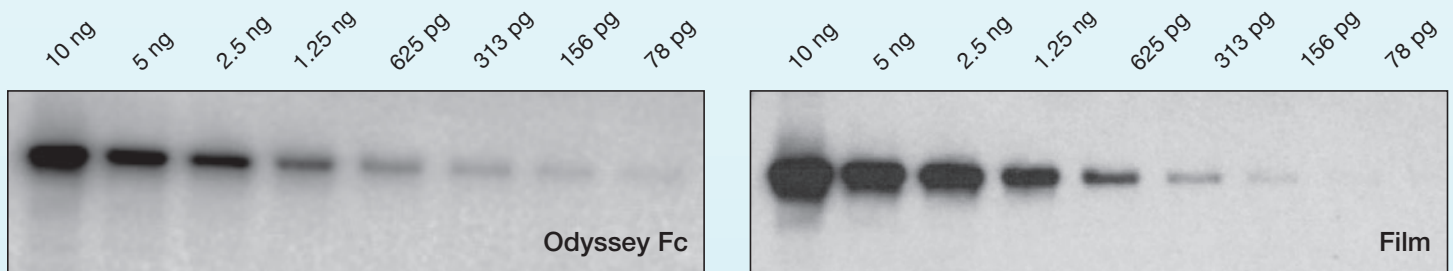
Saturation and blown-out bands are now a thing of the past. With the Odyssey Fc System's one-button image acquisition, a single digital image replaces a stack of time-consuming multiple exposures.

The wide dynamic range of the Odyssey Fc System allows both strong and weak chemiluminescent bands to be clearly captured with only one exposure. This is especially valuable if you wish to quantify the chemiluminescent signal within its available linear range. LI-COR® FieldBrite™ XT technology compensates for time and substrate signal variance issues common to chemiluminescence methods.



With the Odyssey Fc System, chemiluminescent imaging is streamlined for excellent results with minimal user adjustments and without the need for multiple exposures.

Chemiluminescence: Odyssey Fc Imager and Film



Chemiluminescence detection of purified transferrin, using the Odyssey Fc imager or film exposure. Detection sensitivity is similar. **With Odyssey Fc detection, blowout of stronger bands is reduced and band resolution is improved.**

Simply the Best Signal-to-Noise Ratios and Dynamic Range

FieldBrite™ XT technology features a patented filtering system that delivers low total noise for acquisition times of up to one hour. Signal-to-noise ratio is optimized as image acquisition progresses to ensure superior image quality and level of detection. This advanced laser-based detection platform delivers high sensitivity without the need to manipulate data by binning, which can compromise image resolution.

Traditional CCD imagers typically supercool the camera in an effort to reduce noise and improve image quality. Supercooling requires additional energy consumption to maintain operational efficiency and causes longer wait times when powering up the camera.

FieldBrite XT technology reduces total noise without the need to supercool the camera. This innovative, patented technology yields very low total noise and can deliver up to 6 logs of dynamic range for superior sensitivity and imaging quality for both detection methods.

Wide Dynamic Range

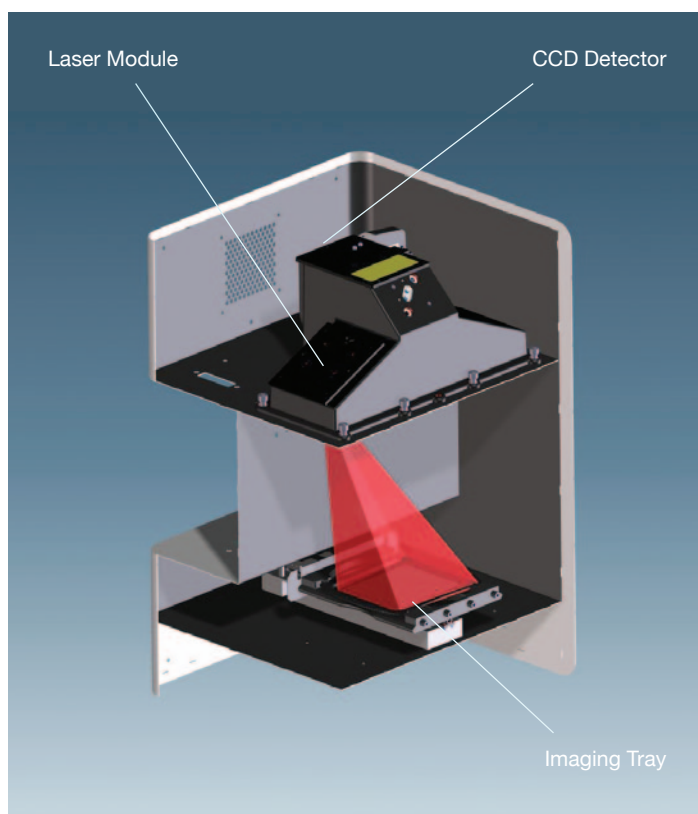
With its wider dynamic range, the Odyssey® Fc Imager accurately captures both strong and weak signals in the same image. Delivering superior image quality with laser-based infrared fluorescence is a hallmark of the Odyssey systems. The Odyssey Fc System continues this tradition of detecting low and high protein concentrations in a single image without signal saturation.

Two Methods, One System

Infrared fluorescent imaging offers the greatest precision for quantitative Western blot analysis. With the proven accuracy and linearity of the Odyssey Fc System, you can be confident of the differences you see in protein levels.

Chemiluminescence, a dynamic enzymatic method, delivers qualitative and semi-quantitative detection across a narrower linear range. With the Odyssey Fc System, chemiluminescent imaging is streamlined for excellent results with minimal user adjustments and no multiple exposures.

The Odyssey Fc System is the ideal solution for researchers who depend on both detection methods to achieve their research goals. Now you can combine both methods in a single imager saving time, lab space, and valuable research dollars.



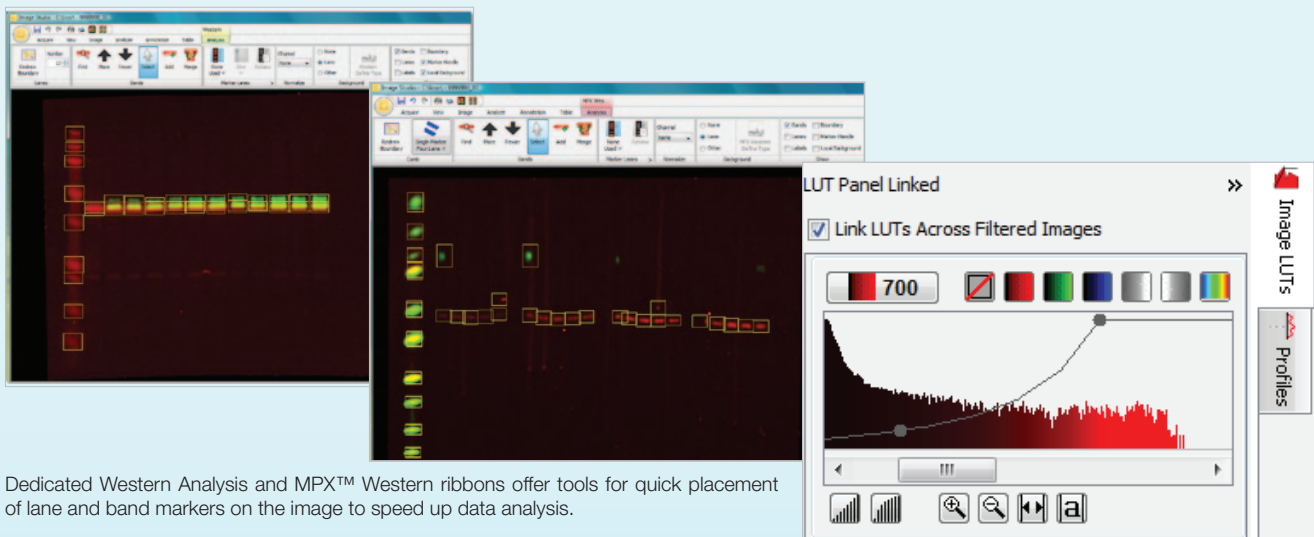
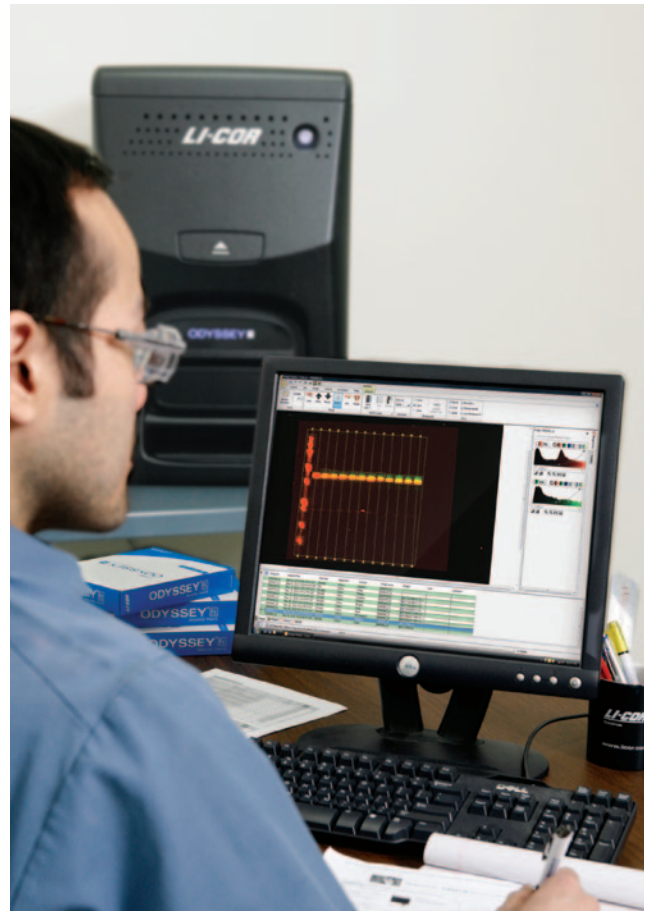
Laser module contains a 685 nm laser and a 785 nm laser. **FieldBrite XT technology ensures uniform illumination of the sample, low coefficient of variation (%CV), and exceptional reproducibility.** Illustration depicts activation of 685 nm channel.

Powerful, Easy-to-Use Analysis Software Introducing Image Studio

Image Studio software is the key to fast, easy image acquisition and analysis with the Odyssey® Fc Imager. Push a button, and the blot is imaged in the detection channels you choose. Select one- or two-channel infrared fluorescence, one-channel chemiluminescence, or, when needed, combine infrared fluorescence and chemiluminescence.

Intuitive ribbon formats provide easy navigation and image analysis flexibility that can be fine-tuned to your specific research needs. This easy-to-learn and easy-to-use interface includes dedicated ribbons for Westerns and MPX™ Westerns, to further streamline your workflow.

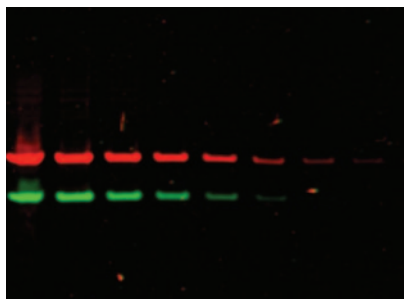
With Image Studio, you can lock the image settings of multiple images for accurate visual comparison, even with images taken months apart.



Dedicated Western Analysis and MPX™ Western ribbons offer tools for quick placement of lane and band markers on the image to speed up data analysis.

Use sliders to adjust the appearance of the image on the screen. Lock the settings across multiple images for accurate comparison.

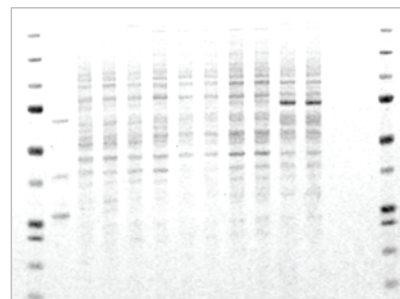
Odyssey Fc Applications



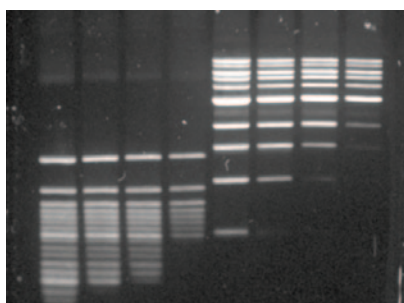
IR Fluorescent Western Blot



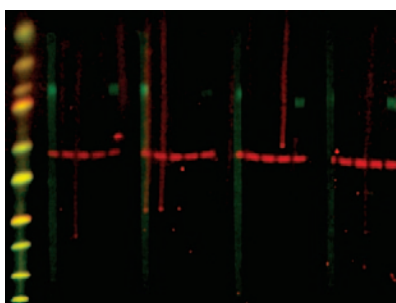
Chemiluminescent Western Blot



Protein Gel Documentation



DNA Gel Staining using Syto[®] 60 Stain

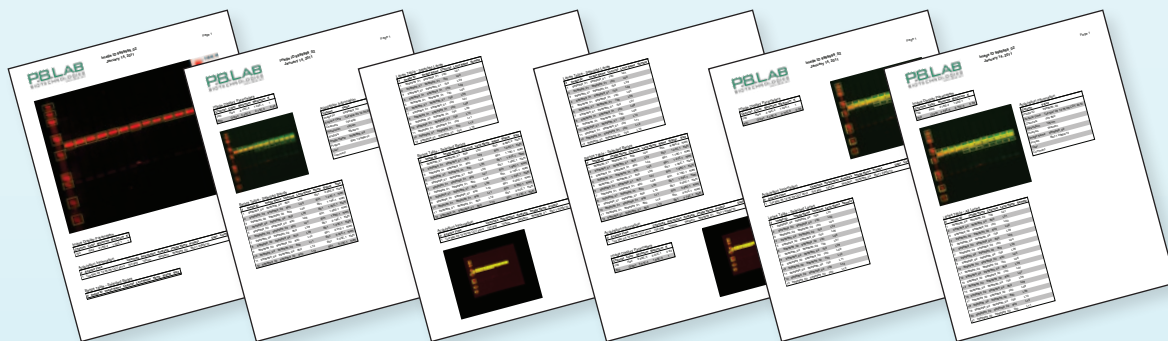


Western Blot Optimization or Antibody Screening Using MPX[™] Blotting System (See next page)

The Odyssey Fc System provides a flexible solution to a variety of imaging needs, including:

- Quantitative IR Fluorescent Western Blots
- Chemiluminescent Western Blots
- Protein Gel Documentation
- DNA Gel Documentation

Lab Book Report



Now you can easily create electronic or hard-copy lab reports customized to meet your specific needs. Design customized templates in Image Studio using a drag-and-drop approach to arrange the content. Then, simply select the desired template to format your data for a custom report.

You can easily design multiple templates and prepare various reports based on your intended audience. If your record-keeping method must vary to meet different documentation requirements (such as GLP or ISO), you can quickly re-arrange a report or add information while maintaining your original Lab Book Report.

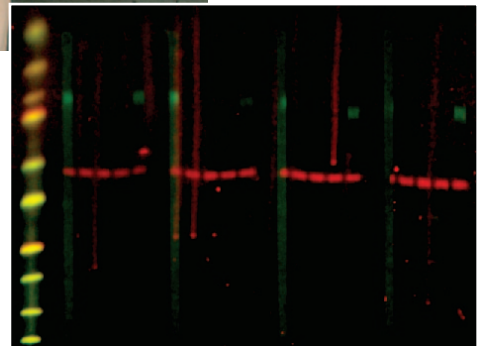
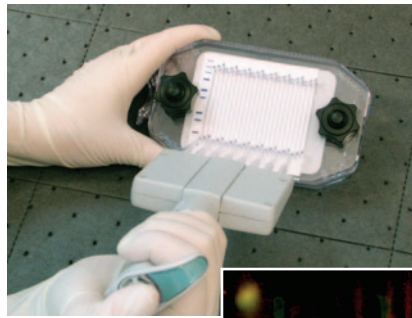
MPX™ Blotting System

The MPX Blotting System is ideal for multiple-target Western blot procedures that use PVDF or nitrocellulose membranes (7 x 8.5 cm). It also allows you to quickly optimize experimental conditions – blocking buffers, primary antibodies, and/or secondary antibodies – in one easy experiment.

Low-volume channel ports (<160 µL) conserve antibodies and reduce costs. Twenty-four channel ports are conveniently spaced, staggered, and compatible with multi-channel pipettes. Forty-eight targets can be visualized on a single membrane with two-color detection. The MPX Blotting System is compatible with many prep gels.

FEATURES

- Screen a single sample and multiple targets on the same blot
- Screen up to 48 different targets with two-color detection
- Optimize blocking and antibody dilution parameters
- Conserve antibody and reagents
- Compatible with a variety of well configurations



MPX Blotting System and representative Western blot imaged with the Odyssey® Fc System shows evaluation of multiple primary and secondary antibody concentrations.

Western Reagents and Accessories

LI-COR Biosciences IRDye® infrared conjugates are optimized for a wide variety of applications. Odyssey Fc System applications include Western blots, MPX Westerns, and gel documentation. For more information about LI-COR Biosciences reagents and accessories designed to streamline your research, please view our online catalog or download our Products and Applications Guide at www.licor.com/bio.

- IRDye secondary antibody conjugates
- Smart™ Gels
- Blocking buffers
- Western blot detection kits
- Membranes
- Incubation boxes
- Protein Molecular Weight markers
- Accessories



Available online at:
www.licor.com/bio

System Specifications

Image Field Size:

10 cm x 12 cm

CCD Pixel Size:

6.45 microns

Dynamic Range:

22 bit (>6 logs)

Depth of Field for Best Sample Focus:

6 mm

Patented FieldBrite™ XT Technology:

CV <3% across field

Laser Lifetime:

20,000 hours of operation

700 Channel Laser Source:

Solid-state Laser Diode at 685 nm

800 Channel Laser Source:

Solid-state Laser Diode at 785 nm

Detectors:

Low-noise CCD. Thermoelectrically cooled.

Acquisition Times:

- Fluorescence (700 and 800 nm) channels: 30 s, 2 min, 10 min plus variable time feature
- Chemiluminescence channel: 30 s, 2 min, 10 min, 60 min plus variable time feature

Focusing:

Automatic

Operating Conditions:

For indoor use only; operating temperature 15-35°C and dewpoint < 22°C, non-condensing; maximum operating temperature may be reduced at elevations above 2000 m.

Power Requirements:

Universal input between 100-127 VAC (4 Amp) and 200-240 VAC (2 Amp); 50-60 Hz. Voltage fluctuations not to exceed 10% of the nominal voltage. Insulation Category II.

Dimensions:

41.4 cm W x 47 cm D x 67.3 cm H (16.3" W x 18.5" D x 26.5" H).
Depth with imaging drawer open is 59.7 cm (23.5").

Weight:

27 kg (60 lb)

ETL/CETL/CE Approved

Related Products



Odyssey Infrared Imaging System
www.licor.com/odyssey



Odyssey Sa Imaging System
www.licor.com/odysseysa

- Odyssey® Fc Imaging Trays
- Odyssey Blocking Buffers
- IRDye® Infrared Dyes and Conjugates
- Blot Washer
- Western Incubation Boxes
- MPX Western Kit and Combs
- NucleoCounter® NC-100 for Automated Cell Counting
- Odyssey Pens
- Odyssey Soft Roller, 4 inches

For more information on the Odyssey Fc Imaging System, including applications and protocols, go to:

www.licor.com/odysseyfc

Westerns on the Odyssey Systems

Better Data, Cleaner Planet



Imaging with Odyssey Systems does not require film, excessive water washes, or hazardous waste associated with film development.

For more details, visit:

www.licor.com/green



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The LI-COR board of directors would like to take this opportunity to return thanks to God for His merciful providence in allowing LI-COR to develop and commercialize products, through the collective effort of dedicated employees, that enable the examination of the wonders of His works.

“Trust in the LORD with all your heart and do not lean on your own understanding. In all your ways acknowledge Him, and He will make your paths straight.”
— Proverbs 3:5,6

