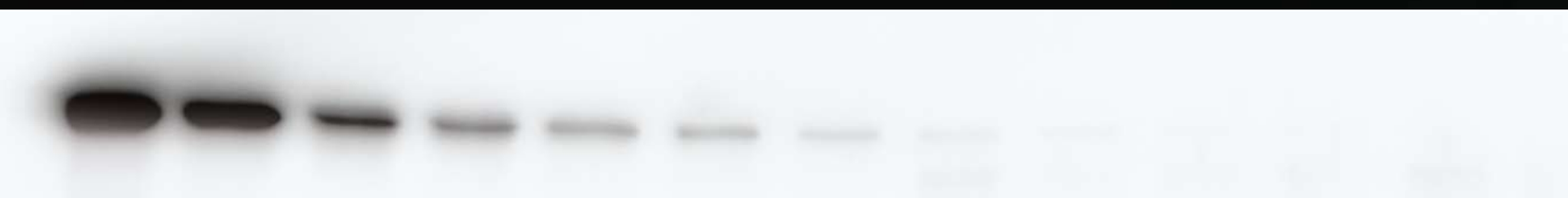
FluorChem® Q



A Quantitative Western Blot Imaging Solution

Alpha Innotech

Contents

Innovative Design

- The FluorChem Q is a total solution for quantitative fluorescent and chemiluminescent Western blot imaging and data analysis

Unique Capabilities

- With industry-leading technology, the FluorChem Q provides the sensitivity, the accuracy, and the dye flexibility necessary for quantitative Western blots and their applications

Sensitive Chemiluminescent Imaging

- The FluorChem Q provides the accuracy and speed essential for quantitative chemiluminescent Western blot analysis

Multiplex Fluorescent Detection

- Compatible with a wide selection of fluorescent labels, the FluorChem Q enables multiplex fluorescent detection to increase the quantitative power of Western blotting

AlphaView® Q Software

- Simplifies multicolor Western blot analysis, increasing the speed and accuracy of data analysis

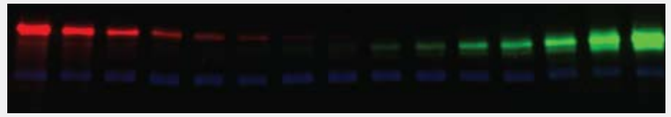
Wide Selection of Compatible Applications

- Multiple dyes and stains are possible for Western blots, DNA gels, protein gels and more

FluorChem® Q

Superior performance in quantitative Western blotting requires a sensitive, accurate system capable of both chemiluminescence and fluorescence imaging, as well as unique software tools designed for Western blot analysis. The FluorChem Q is the complete solution for quantitative Western imaging and analysis.

Chemiluminescent Western blot imaged with the FluorChem Q. A two-fold serial dilution of human Transferrin was run on a standard SDS-PAGE gel and transferred to a membrane. After incubation with primary and HRP-conjugated secondary antibodies, the image was captured with the FluorChem Q.



Multicolor fluorescent Western blot imaged with the FluorChem Q. Three proteins were separated on a standard SDS-PAGE gel and transferred to an Immobilon-FL PVDF membrane. Transferrin was detected with Cy5 in the red channel. α_1-Fetoprotein was detected with Cy3 in the green channel, and IgG was detected with Cy2 in the blue channel. The three channels are merged in this composite image so that all proteins can be visualized simultaneously. Total imaging time for all three channels was 64 seconds.

Innovative Design

Versatile Imaging Station

High Resolution, Peltier Cooled Camera

The 4.2 million pixel camera is capable of imaging blots at up to 60 micron resolution. Peltier cooling reduces background noise, increasing the dynamic range and lowering the limit of detection in Western blot images

Fast Lens Technology

The FluorChem Q achieves rapid imaging speeds by means of a powerful F0.95 fixed lens

Automatic 6-position Filter Wheel

A wide variety of choices in fluorescent imaging is available. Four emission filters come standard with the system and provide spectral compatibility with the light sources in the cabinet

Dual Epi UV Lights

(Optional)

Epi illumination UV lights are ideal for illuminating samples such as Qdots

3 Excitation Channels

The FluorChem Q is manufactured with 3 excitation channels, compatible with the dyes most commonly used with fluorescent Western blots

Fluorescent Blot Sample Holder

The sample holder positions fluorescent Western blots at the correct position within the cabinet for uniform illumination, optimal imaging, and automatic calibration and registration of multicolor images

Dual-Wavelength UV Transilluminator

The dual-wavelength transilluminator enables the instrument to excite a wide variety of dyes used in DNA and protein gel electrophoresis

Light-tight Cabinet

The MultiImage® III cabinet functions as a darkroom at the benchtop, eliminating the need for a separate darkroom to develop chemiluminescent Western blots

Protocol Driven AlphaView® Q Image Acquisition and Analysis Software

AlphaView Q software allows imaging protocols to be saved and recalled with just one click. This unique analysis software is designed specifically for the analysis of multicolor Western blots

White-light Table

(Not shown)

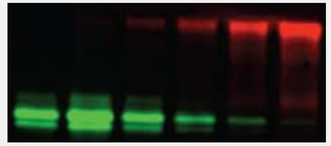
The fold-up white-light table is perfect for providing images of Coomassie- or silver-stained protein gels

Unique Capabilities

Innovative Design Features Make the FluorChem® Q Stand Out

A Total Solution

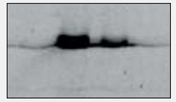
SpectraPlex™ is a complete kit for multicolor fluorescent Western blotting, optimized for the FlourChem Q. SpectraPlex includes all the reagents needed to carry out a Western protocol, and is designed to provide high sensitivity while maintaining very low background. Imaging and analysis of the SpectraPlex multicolor blots is straightforward using the FluorChem Q software.



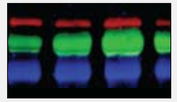
SpectraPlex fluorescent Western kit

One Instrument, Multiple Applications

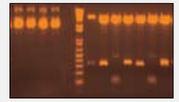
Unparalleled flexibility and ease of use are the hallmarks of the FluorChem Q. Applications include, but are not limited to, the following:



Chemiluminescent Westerns

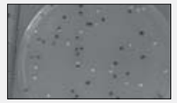


Fluorescent Westerns



Fluorescent DNA & Protein Gels

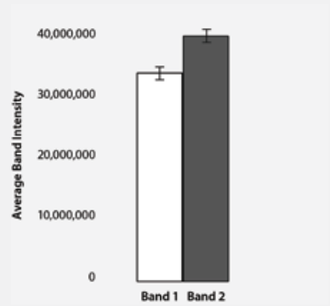
Colorimetric Protein Gels



Colony Plate Imaging

Quantitative Accuracy

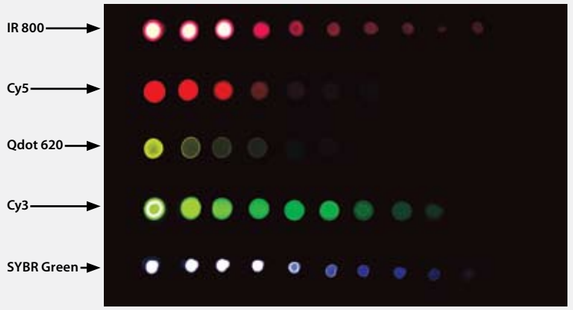
Reproducibility and accuracy are required for quantitative imaging. The FluorChem Q provides an even illumination field to give you the most replicable data for your fluorescent Western blots.



Uniformity of fluorescence imaging on the FluorChem Q. Two bands on one Western blot were imaged at 12 different positions within the FluorChem Q and quantified. The mean value and standard deviation for each band are shown. The CV for band 1 was 3.1%, and for band 2 was 2.7%.

Open Platform

The FluorChem Q is compatible with a wide variety of dyes and kits. In most cases, you won't have to change your protocol.



Five fluorescent dyes can be captured in one assay with the FluorChem Q. A different exposure time, excitation source, and emission filter was used for each dye.

Rapid Imaging

Save time when imaging with the FluorChem Q. Imaging times for a three-color Western were 15 times faster than a traditional laser scanner.

Imaging System	Imaging Time	Resolution
FluorChem Q	64 seconds	60 micron
Laser Scanner	15.5 minutes	100 micron

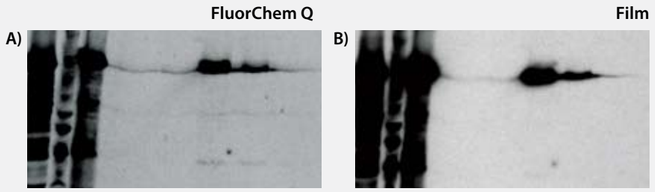
Chemiluminescence

Sensitive Chemiluminescent Detection of Proteins

Sensitivity, dynamic range and linearity are required to detect and quantitate proteins on a Western blot. The FluorChem® Q provides accuracy and speed for quantitative chemiluminescent Western blot analysis.

The Sensitivity of Film Without the Darkroom

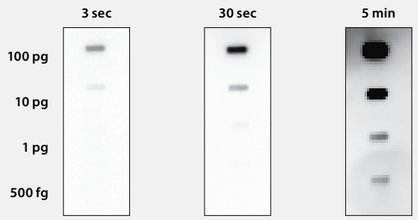
The FluorChem Q requires no film, no chemicals and no darkroom. You get the same high performance of conventional film detection, and because your blots and gels are stored digitally, they are ready when you need them for analysis, annotation, sharing or publication.



Recombinant protein and whole cell extracts/fractions subjected to SDS-PAGE, transferred to nitrocellulose and immunodetected with primary antibody and an HRP-conjugated secondary antibody. Chemiluminescent reagent: ECL from GE Healthcare. A) Imaged with FluorChem Q (1-minute exposure, 1X1 bin). B) Imaged with film (1-minute exposure).

Take the Guesswork Out of Capturing the Best Image

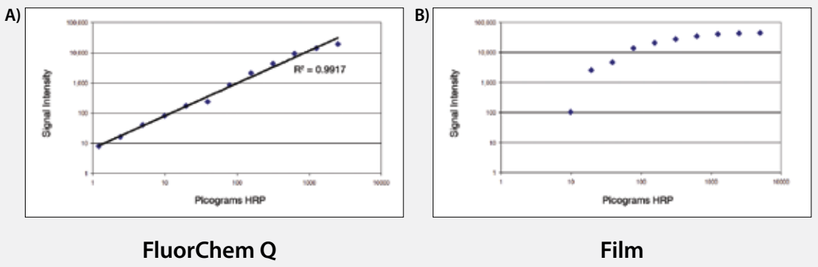
Digital image capture eliminates the expensive waste of film that results when multiple captures are required to ensure the best sample image. Preview your image until you detect the bands you want, then capture the image, save it and you're done.



Slot blot of antibody coupled to HRP, spotted on a PVDF membrane and detected with the chemiluminescent substrate ChemiGlow®. All three images were captured with an 8 × 8 bin.

Quantitative Accuracy that Surpasses Film

Unlike film's narrow dynamic range, which makes it unsuitable for accurately detecting changes in protein amount, the FluorChem Q has a wide dynamic range for superior quantitative analysis.



Comparison of FluorChem Q with film. A two-fold dilution of HRP conjugated antibody was spotted onto a membrane and imaged with the FluorChem Q and with film. Figure A) The response of the FluorChem Q to chemiluminescence signal was linear from 2.5 nanograms to 1.2 picograms, a dynamic range of 2083:1. Image exposure time was 6 minutes, and was captured using a 1X1 bin. B) Film exposure required 5 minutes to see a similar limit of detection, but showed rapid saturation of signal.

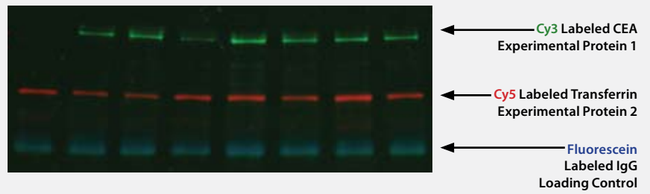
Fluorescence

Multiplex Fluorescent Westerns for Accurate Protein Quantitation

Multicolor fluorescent imaging enables scientists to examine multiple proteins in a single assay, vastly increasing detection and quantitative power.

Detect Multiple Proteins in One Assay

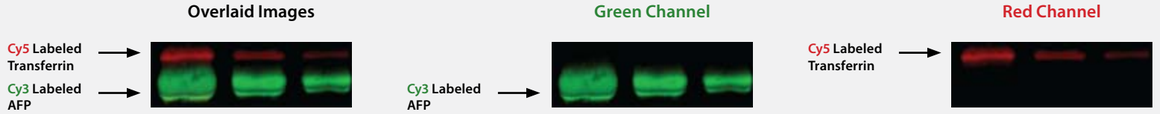
Save time and sample by detecting multiple proteins on the same assay without the need to strip and reprobe the blot. Easily normalize your intensity values to a loading control to correct for inaccuracies in loading.



Composite image of a three-color fluorescent Western blot. Three different proteins, Transferrin, Carcino Embryonic Antigen (CEA), and IgG, were detected with fluorescently labeled antibodies, and imaged in three spectrally unique fluorescent channels. Imaging time was 24 seconds.

Resolve Co-migrating Proteins

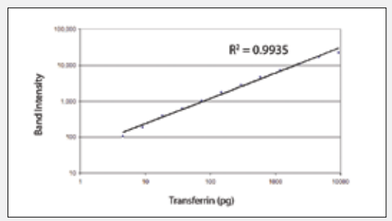
Multicolor fluorescent Westerns allow you to probe even for overlapping proteins. Phosphorylated and unphosphorylated isoforms, or any proteins with a similar migration, can now be detected on one blot.



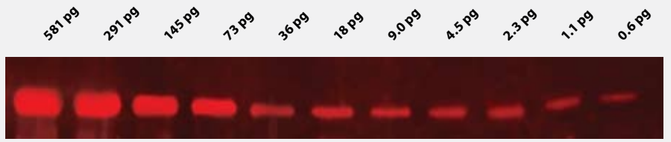
In the above gel, the samples containing AFP were separated in the presence of total human serum. AFP co-migrates with albumin which is the most abundant protein in serum. This makes bands of AFP to appear very broad. It would be difficult to resolve AFP bands from those of Transferrin through radiographic or chemiluminescent detection. With multicolor fluorescent Western blotting, the two bands are imaged in separate fluorescent channels, and are easily resolved.

Accurately Quantify Proteins

Accurate quantification of fluorescent Westerns is essential to accurately detect subtle changes in protein level. The FluorChem Q provides the wide dynamic range and the sensitivity for your application needs.



The dynamic range was determined using a serial dilution of Transferrin detected with a Cy5 labeled antibody. The dynamic range was linear over 3.3 orders of magnitude.



Serial dilutions of Transferrin detected by Western blot with a secondary Cy5 labeled antibody and imaged on the FluorChem Q. A lower limit of 0.6 pg Transferrin was detected.

AlphaView® Q Software

Image Capture

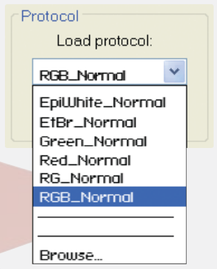
Capture the Image Right the First Time

AlphaView Q allows you to preview your sample before you acquire an image. See the effect of various exposure times and other settings before capturing your final image.

Saturation Detection

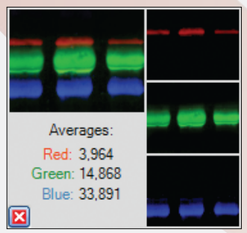
Accurate quantitation can be performed only on samples that aren't saturated. AlphaView Q allows you to determine if your image is saturated while previewing the image or after image acquisition.

Application Driven Acquisition



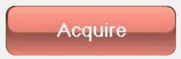
AlphaView Q simplifies the imaging process by allowing a protocol to be saved for a unique experiment. The protocol is recalled with one click and saves the user time by storing the light sources, filter settings and optimal exposure time.

Channel Viewer



The unique channel viewer feature allows you to visualize all the features in your sample simultaneously as a three-color or single-channel image. If two bands overlap, you can see the contributions from each channel simply by placing the channel viewer over the feature.

Multichannel Image Acquisition with One Click



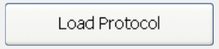
After setting up the ideal conditions for acquiring your image, clicking Acquire will capture a single or multicolor image. There is no need to take each channel of a multicolor image separately.
Once the images are acquired, up to three channels are immediately overlaid into a multicolor image.

Automatically Saves All Image Variables

All the relevant information on how an image was captured is automatically stored along with your image once it is saved. When reviewing your data, you will always be able to recall the day, time, exposure time, and settings used to acquire the image.

Image Analysis

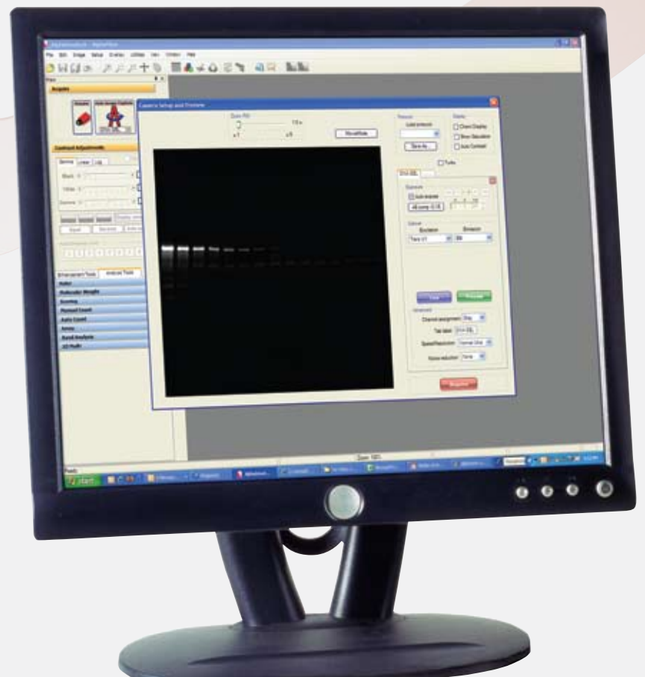
Protocol Driven Analysis



Repeating an experiment multiple times is required for accuracy. Recognizing this fact, we designed AlphaView Q to let you save your analysis protocol and apply it to any image. This reduces the risk of introducing errors during analysis. Multiple analysis protocols can be saved for various experimental conditions or users. The stored protocol "remembers" the number of regions to be analyzed and the preferred display option.

Automatic Normalization for Loading Controls

Loading controls, typically highly abundant proteins not affected by experimental conditions, are commonly used in Western imaging to ensure consistency when loading across multiple lanes. AlphaView Q is designed with a unique feature that automatically adjusts the intensity value of the band of interest and displays the normalized results.



Rapidly Detects Fold Change

The software saves you time by automatically telling you the fold change in your sample level intensities relative to a positive control.

Customizable Data Output

To help you manage the large amount of data acquired in multicolor imaging, the AlphaView Q allows you to customize the output table and show only the values and data that directly relate to your experiment.

Tools for 1-D gel, Molecular Weight Analysis, and More

AlphaView Q features modules for molecular weight analysis, 1-D gel analysis, colony counting, and 96 well plate analysis.

Save and Load Your Analysis Results

AlphaView Q allows you to save and load your analysis results, in case you need to review your data later.

View Images Side by Side

Comparing images is easy with the multiple windows available for side by side viewing of your images.

Annotation Tools

AlphaView Q has standard annotation tools for labeling your sample lanes or sample type.

Applications

FluorChem® Q: Recommended Excitation/ Emission Filters for Compatible Dyes*

SpectraPlex™

Label	Light Sources	Emission Filters
APC goat-anti-rabbit	632 Channel	699
RPE goat-anti-mouse	534 Channel	606

Multiplexing

Stain/Label/Dye/Method	Light Sources	Emission Filters
Cy2	475 Channel	537
Cy3	534 Channel	606
Cy5	632 Channel	699
Qdot 525	Epi UV 365	Qdot 525
Qdot 565	Epi UV 365	Qdot 565
Qdot 585	Epi UV 365	Qdot 585
Qdot 605	Epi UV 365	Qdot 605
Qdot 655	Epi UV 365	Qdot 655
Qdot 705	Epi UV 365	Qdot 705
DyLight 488	475 Channel	537
DyLight 549	534 Channel	606
DyLight 633	632 Channel	699
DyLight 649	632 Channel	699
DyLight 680	632 Channel	699
Alexa Fluor 488	475 Channel	537
Alexa Fluor 546	534 Channel	606
Alexa Fluor 555	534 Channel	606
Alexa Fluor 633	632 Channel	699
Alexa Fluor 647	632 Channel	699
Alexa Fluor 680	632 Channel	699

Blotting

Chemiluminescence	None	None

Protein Staining

Coomassie Blue	Trans White	Orange
Silver Stain	White Light	Orange
Deep Purple	Trans UV 365	Orange
Coomassie® Fluor Orange	Trans UV 302	Orange
SYPRO® Tangerine	Trans UV 302	Orange
SYPRO® Orange	Trans UV 302	Orange
SYPRO® Red	Trans UV 302	Red
SYPRO® Ruby	Trans UV 302	Orange

Nucleic Acid Staining

Ethidium Bromide	Trans UV 302	Orange
GelStar®	Trans UV 302	537
SYBR® Green	Trans UV 302	537
SYBR® Gold	Trans UV 302	537
SYBR® Safe	475 Channel	537

*Other dyes and excitation/emission pairs are possible.

FluorChem® Q

system configuration

PART DESCRIPTION	PART NUMBER
FluorChem Q Includes: 4.2 million pixel camera with 16 bit A/D, cooled to -25 ° C absolute and regulated, F 0.95 50 mm fixed lens, MultiImage® III Cabinet with Orange filter, 537 filter, 606 filter & 699 filter, white light table, sample tray, ML-26 dual wavelength, dual intensity UV Transilluminator, Epi white lights and 3 Epi excitation channels at 475 nm, 534 nm, and 632 nm. Also includes AlphaView® Q System Software, and 2 licenses good for the AlphaView Q Stand Alone software.	92-14095-00 (110V) 92-14116-00 (220V)

reagents

PART DESCRIPTION	PART NUMBER
SpectraPlex™ MultiColor Fluorescent Western Kit Includes: Secondary antibodies, wash solution, blocking solution.	60-14242-00
ChemiGlow® West Chemiluminescence Substrate Kit Includes: Chemiluminescent substrate optimized for CCD digital Imaging on FluorChem systems.	60-12596-00

accessories

PART DESCRIPTION	PART NUMBER
AlphaView Q Stand Alone Software For annotation and analysis of images including densitometry, colony counting and molecular weight determination.	91-14159-00
Computer for FluorChem Family	91-11947-00
Short and Long Wavelength, Reflective Epi-UV 365 and 254 nm	91-12979-00 (110V) 91-12978-00 (220V)
AIC Thermal Printer	92-12999-00
High Contrast Thermal Paper (4 rolls per box)	P-150A
Chromalight® Multi-Wavelength Illuminator Option	91-13419-00

specifications

Detection	4.2 MP 16 bit Peltier cooled CCD Camera with F 0.95 fixed lens
Light Sources	Epi Illumination: 475 nm, 534 nm, 632 nm, and white light; optional 365 nm and 254 nm. Trans Illumination: 365 and 302 nm, white light.
Lamp Lifetime	For EPI 475 nm, 534 nm and 632 nm: 10,000 hours
Imaging Time	Less than 1 minute for a typical 3 color fluorescent blot
Image Area/Resolution	For blots: 12 x 12 cm at 59 microns/pixel For standard UV excited gels: 15 x 15 cm at 75 microns/pixel
Uniformity	>95% uniformity over image
Data Format	16-bit TIFF, 48-bit three-channel RGB TIFF, 8-bit JPEG
Instrument Size	20 in X 15 in X 38.5 in (50.8 cm X 38.1 cm X 97.8 cm)
Weight	100 lbs (45.4 kg)
External Interface	COM port, USB port
Power Requirements	115/230V, 50-60Hz
Certifications	CE, TUV, CSA

Alpha Innotech

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