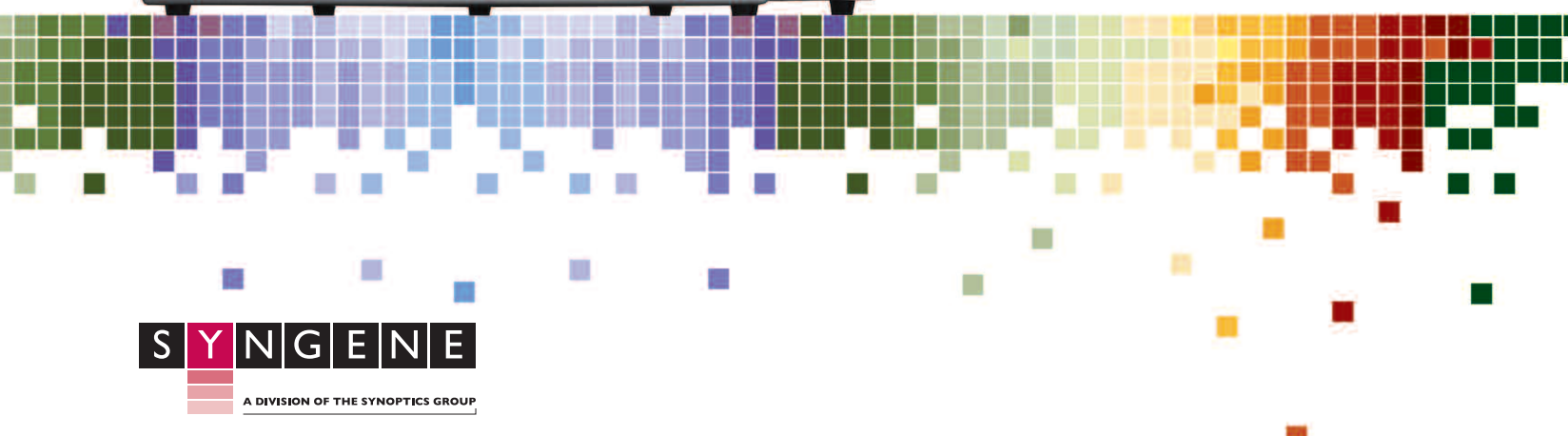


# G:BOX

Gel Documentation and Analysis  
Automated imaging



**S Y N G E N E**  
A DIVISION OF THE SYNOPTICS GROUP

# GEL IMAGING AND ANALYSIS

Automated imaging for all your applications

Syngene imaging systems are recognised world-wide as high quality, high performance instruments for the capture and analysis of fluorescent gels, chemiluminescent western blots and protein samples. With over 25 years of experience our systems are respected for their reliability and accuracy. Syngene has pioneered new innovations in gel imaging and this latest series of the acclaimed G:BOX is no exception.

The G:BOX range features the new GeneSys control software which takes automation to a new level.

## ALL SYNGENE SYSTEMS ARE NOW 'APPLICATION DRIVEN'.

With a G:BOX system you simply tell it your application and GeneSys does the rest. Using an extensive database the system calculates the best configuration for any dye or substrate you are using and automatically sets camera, lens, lighting and filters as necessary. This leaves you to view the final

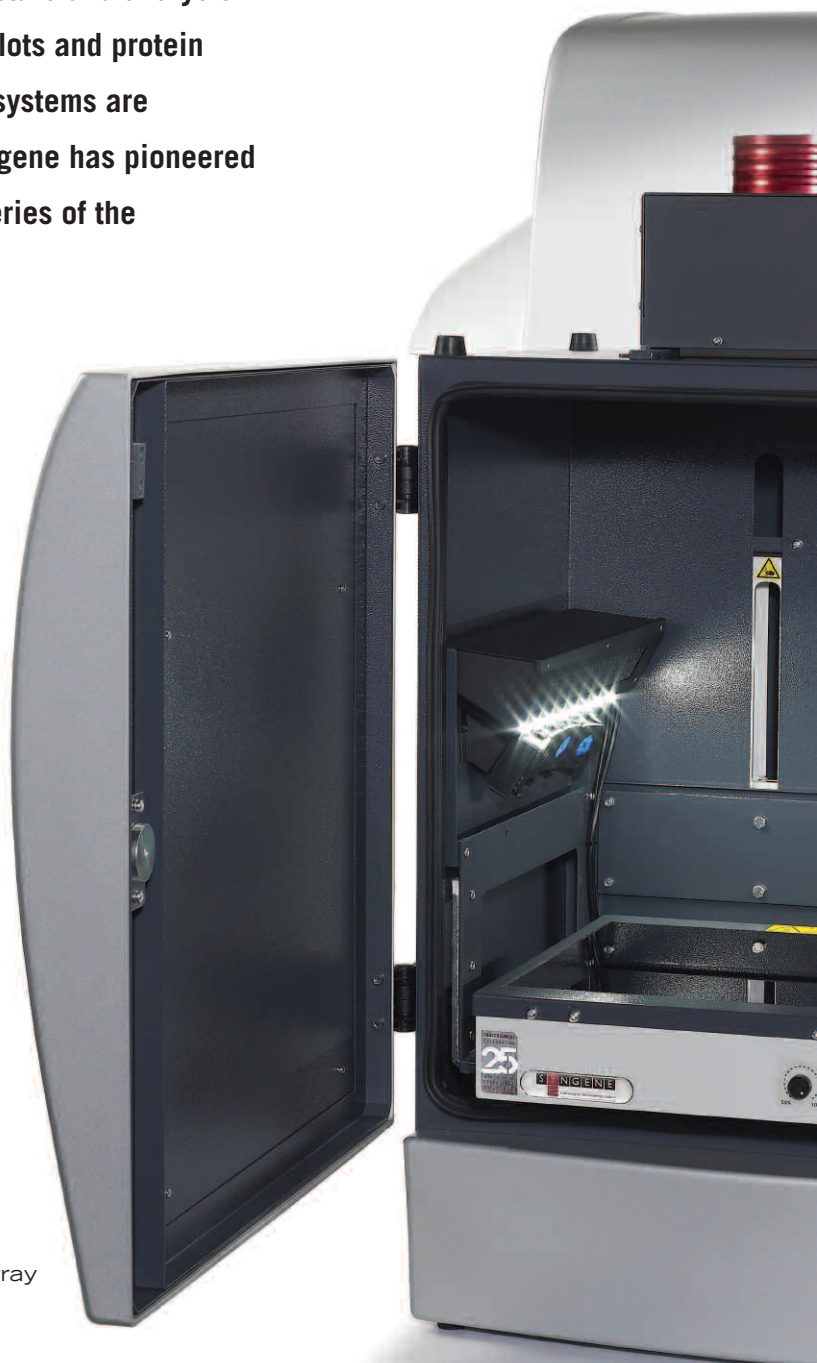
high quality image at the touch of an on-screen button.

To extend the range of applications the G:BOX uses a unique 'plug and play' lighting system featuring LED modules. These 'clip-in' modules are available with Red, Green, Blue and IR outputs allowing you to work with an extensive array of colorimetric dyes.

Additionally, modules for working with multiplex samples are also available.

As usual with any Syngene system, analysis software comes as standard. The GeneTools package for 1D analysis, BP/MW, quantification, spot blots and colony counting is the first choice for many researchers and the latest version is supplied with all G:BOX systems.

There are 5 models to choose from across the G:BOX range.





### Camera

A choice of 16 bit ultra quiet cameras ranging from 1.4m up to 8.3m pixels. Cameras have varying degrees of cooling.



### Lenses

All lenses are computer controlled and are motor driven. When the system has the motor driven stage (XL<sup>1.4</sup>, XT<sup>4</sup> and XX<sup>8</sup> models) the lens automatically tracks any upward or downward movement of the sample using auto-focus. The XL<sup>1.4</sup>, XT<sup>4</sup> and XX<sup>8</sup> models have exceptional high performance essential for some chemiluminescence or low light level fluorescence applications.



### Filters

A 7 position computer controlled filter wheel is standard. (Optional with EF<sup>2</sup> and XL<sup>1.4</sup>). There is an extensive range of emission filters for an array of applications. Check the Syngene Product and Application selector on [www.syngene.com](http://www.syngene.com) for more information.



### Overhead (Epi) illumination

#### White light

Every G:BOX has an integral white LED lighting system.

#### Ultra violet (UV) option

A module can be fitted with either a 365, 302 or 254nm UV tube.

#### LED lighting option

To extend the range of applications, the G:BOX can use a unique 'plug and play' lighting system. The LED lighting modules are single wavelength and simply clip into a lighting gantry (optional extra). Up to 4 modules can be plugged into each side of the darkroom, either of the same or mixed wavelengths.

There are 9 different LED modules to choose from. Standard modules have cut off filters and generally produce a wider output wavelength whereas the 'M' series is fitted with special 'band pass' filters which allows the imaging of multiplexed blots with minimal cross-talk between dyes.



### Visible light

For extending the transmitted light applications such as Coomassie gels there are conversion screens.

- NovaGlo visible converter screen for all visible light applications;
- Blue converter screen for blue excitation dyes (optional).



### Adjustable stage

On the XL<sup>1.4</sup>, XT<sup>4</sup> and XX<sup>8</sup> models there is a motor driven stage included as standard. This enables samples to be moved closer to the camera. This is especially useful when working with smaller sample sizes. The stage is also linked to the GeneSys controller so that the lens automatically 'tracks' the sample as it is moved up or down providing auto-focus.



### Darkroom

G:BOX has a fully light tight, robust darkroom suitable for advanced chemiluminescence, fluorescence and visible light applications. An electronic, auto-door lock with security function prevents interruption to long exposures.



### Transilluminator

A 302nm transilluminator slides out for easy access. It has a variable intensity setting and has a safety cut-off. Other wavelengths are available.



### Blue light transilluminator (option)

A blue light transilluminator operating at 450nm and suitable for use with a range of dyes including all the 'safe' dyes which are alternative to ethidium bromide.

# POWERED BY GENESYS

Applications at the touch of a button

The biggest difference between a Syngene system and any other is in the way in which the **G:BOX** is controlled.

## GENESYS, AT THE HEART OF EVERY G:BOX, IS AN APPLICATION DRIVEN SOFTWARE.

You will know exactly what your application is and how you have prepared your gel or blot. You simply enter this information into GeneSys and the system takes over the rest. At the heart of GeneSys is an extensive database containing data relating to a very wide range of applications, eg, fluorescence, chemiluminescence and chemifluorescence. Once the **G:BOX** has been told what sample to expect GeneSys decides what hardware configuration is best and sets the system ready for image capture. Camera control, exposure time, sensitivity setting, lighting requirements, lens control, filter selection - all this is controlled by GeneSys.

The fully automatic functions of GeneSys allow even the most difficult or complicated gels and blots to be imaged. With chemiluminescence, the system uses its intelligence to know the output profile of most of the major substrates. It then decides the best exposure setting. During the image capture process it continually monitors the output from the blot until the best image is produced.

GeneSys is ideal for multiplexed gels and blots. Once the application information is selected by the user GeneSys will make separate exposures using the correct filter, lighting and camera setting for each dye. The final multiplex image will be displayed.

GeneSys has been designed for use with a touch panel PC and to take advantage of the new functions afforded by Windows 7.

*GeneSys lets you control the system automatically or manually. An image browser facility allows you to view stored images. Previously saved protocol configurations can easily be accessed.*

*GeneSys is icon driven and has been designed for use with a touch screen although using a keyboard and mouse with a monitor is still possible.*

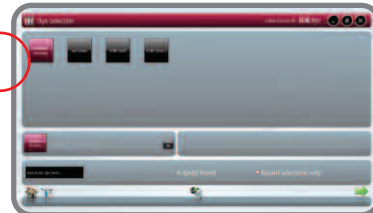




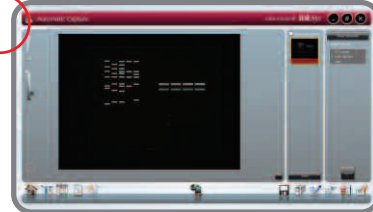
The user need only select sample format, sample type and media type for the G:BOX to automatically configure itself to capture the best image.



The type of dye being used can be selected from the extensive internal database.



When using automatic capture the system will use the optimum lighting, filter and exposure time to produce the best image. Captured images are shown in the main part of the screen while previously captured images are displayed in an image pool as a series of thumbnails. The capture of multiplex images is very easy in auto-mode. The system will capture each dye separately using the optimum settings ensuring minimal crossover before displaying each image and the composite image.



A full range of editing tools are available to annotate, manipulate, enhance, save and print the image.



The user can have full manual control of all functions.



# G:BOX APPLICATIONS

Applications you can image with a G:BOX

## DNA detection with Ethidium Bromide or 'Safe' dyes

Using the 302nm UV transilluminator and Orange emission filter, images of ethidium bromide stained DNA gels can be captured in a fraction of a second. An alternative using less harmful 'Safe' dyes and blue light can produce similar images of DNA gels without loss of sensitivity.

## Protein analysis

Protein gels stained with either coomassie blue stain or silver stain can easily be captured with a G:BOX using a white light converter screen with the UV transilluminator or a white light table.

## Fluorescence stained gels

Syngene's LED lighting modules (Red, Green, Blue, IR) cover a wide range of fluorescence applications and dyes (eg, Q-Dots, Dylights, Alexa fluor, Cy dyes and LICOR IR dyes). Using the correct excitation light source and corresponding emission filter virtually any application can be used with a G:BOX. The Syngene database which controls a G:BOX already has thousands of different imaging protocols which it automatically selects from when using these colorimetric dyes.

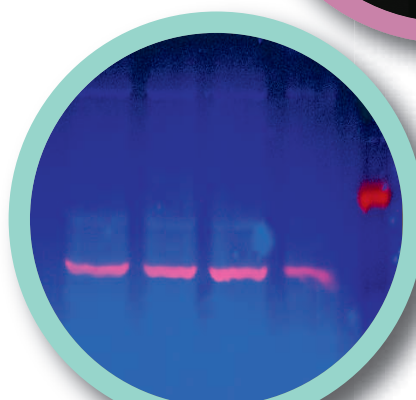
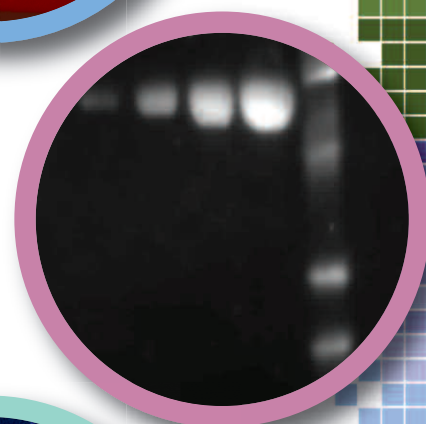
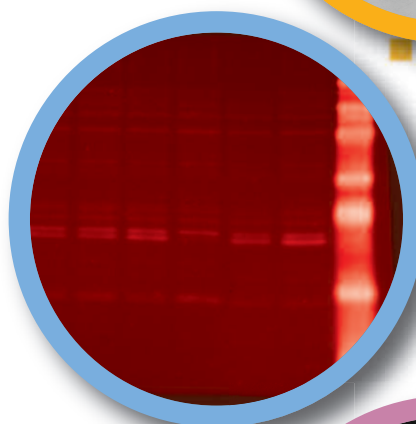
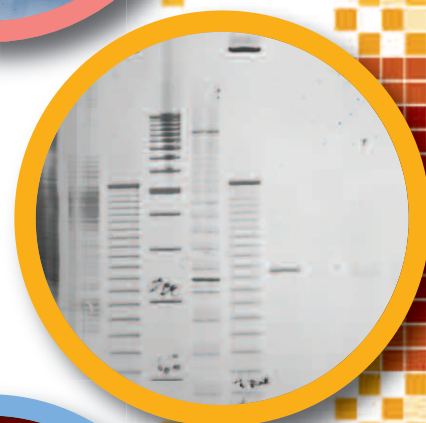
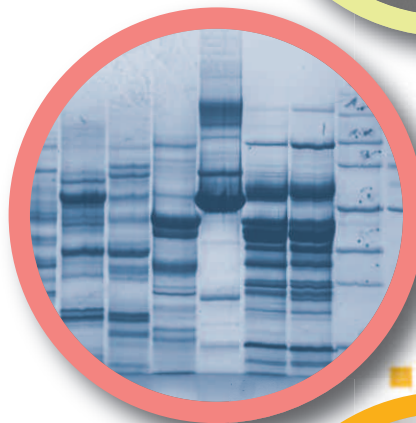
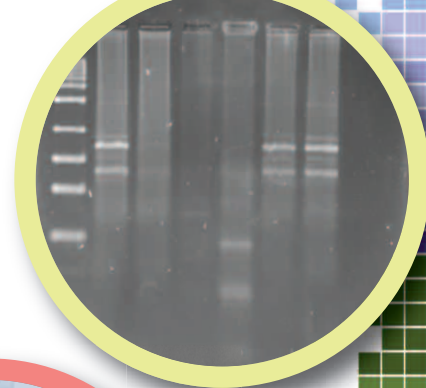
## Chemiluminescence with or without colorimetric markers

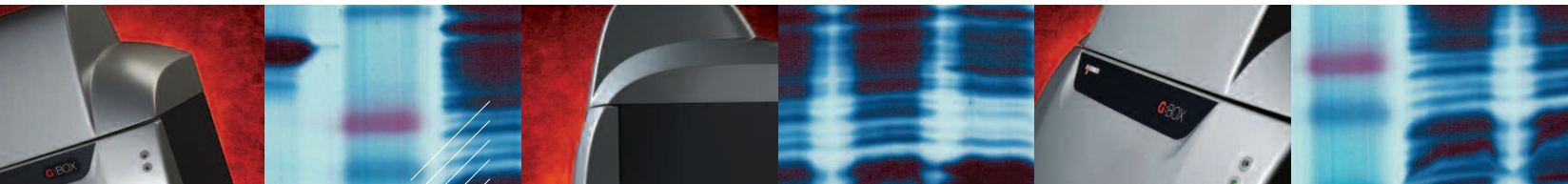
Chemiluminescence with a G:BOX is very easy. Simply place the blot inside the system and GeneSys will assess the output. Within seconds you can make a choice between having a speedy image or one taking a little more time if high quality is required. Either way you can capture quality chemiluminescence images with accuracy and minimal effort. Colorimetric markers can also be automatically captured and merged on to the same image.

## Multiplex imaging

The use of multiplex dyes on gels or blots is increasing. With a G:BOX using GeneSys the user need only select the dyes being used and the system calculates the rest. Dye spectra, lighting and filters are all contained within the database. The result is that effortlessly you get perfect multiplexed images. The system uses the LED lighting modules that are configured for multiplexed dyes in conjunction with the corresponding filters.

- Safe dye ○
- Coomassie ○
- Silver ○
- Single colour dye ○
- Chemi image with marker ○
- Multiplex imaging ○





## GEL AND BLOT ANALYSIS WITH GENETOOLS




Every G:BOX comes with a copy of our acclaimed GeneTools analysis software. This highly automated software can rapidly analyse a gel from loading to output of results in a matter of seconds. Simplicity is the key feature of GeneTools allowing even the most inexperienced user to obtain fast, accurate results at the click of a button and with minimal training.



- 1D gel analysis
- MW/BP calculation
- Quantification
- E-gels
- Band matching with dendrograms
- Spot blots
- Colony counting
- GeneDirectory (option) for extended band matching, cluster analysis, VNTR analysis, genotyping, RFLP studies, dendrogram generation, bootstrapping













## G:BOX Specifications

	 G:BOX EF <sup>2</sup>	 G:BOX CHEMI XR <sup>5</sup>	 G:BOX CHEMI XL <sup>1.4</sup>	 G:BOX CHEMI XT <sup>4</sup>	 G:BOX CHEMI XX <sup>8</sup>
Pixels	2.0	5.0	1.4	4.2	8.3
A/D	16 bit	16 bit	16 bit	16 bit	16 bit
Greyscales	65536	65536	65536	65536	65536
Dynamic range	4.8	4.8	4.8	4.8	4.8
Cooling	Low level cooling for extended fluorescence REGULATED	Ultra peltier cooling for extra long exposures REGULATED	Ultra peltier cooling for extra long exposures REGULATED	Ultra 2 stage peltier cooling for extra long exposures REGULATED	Ultra peltier cooling for extra long exposures REGULATED
Lens	F1.4 Optional F1.2 with feed back	F1.2	F0.85	F0.95	F1.4 Optional larger format
Filter wheel motor driven	Option	Yes	Option	Yes	Yes
Illumination					
UV transilluminator (20x20 cm)	Yes	Yes	Option	Yes	Yes
Visible light NovaGlo	Yes	Yes	Option	Yes	Yes
Blue light converter	Option	Option	Option	Option	Option
White Epi - overhead	Yes	Yes	Yes	Yes	Yes
Epi UV	Option	Option	Option	Option	Option
Epi LEDs for fluorescence	Option	Option	Option	Option	Option
Epi IR	No	Option	Option	Option	Option
Fold down visible light table	Option	Option	No	No	No
Blue light transilluminator	Option	Option	Option	Option	Option
Dimensions (W,H,D cm)	57 x 85 x 43	57 x 85 x 43	57 x 100 x 52	57 x 100 x 52	57 x 100 x 52
Weight	37kg	37kg	45kg	45kg	45kg

## G:BOX models

There are 5 G:BOX systems covering a wide range of applications

- 
**G:BOX EF<sup>2</sup>** This system features a 2m pixel camera and is the ideal choice for general fluorescence work such as ethidium bromide gels and proteins. The range of applications can be extended by adding lighting modules.
- 
**G:BOX XR<sup>5</sup>** For general fluorescence and chemiluminescence applications this model with a 5.0m pixel camera is perfect. It too is suitable for upgrade by adding lighting modules.
- 
**G:BOX XL<sup>1.4</sup>** The XL<sup>1.4</sup> has been configured for high performance chemiluminescence and uses an exceptionally sensitive 1.4m pixel camera and a large aperture (f0.85) lens. The system can be upgraded for fluorescence applications if required.
- 
**G:BOX XT<sup>4</sup>** This high performing system is suitable for fluorescence and chemiluminescence using a 4.2m pixel camera. It has a large aperture lens (f0.95) making it perfect for low light level applications where longer exposures are needed.
- 
**G:BOX XX<sup>8</sup>** Our highest resolution system at 8.3m pixels for fluorescence and chemiluminescence.

	 G:BOX EF <sup>2</sup>	 G:BOX CHEMI XR <sup>5</sup>	 G:BOX CHEMI XL <sup>1.4</sup>	 G:BOX CHEMI XT <sup>4</sup>	 G:BOX CHEMI XX <sup>8</sup>
<b>Chemiluminescence</b> eg. ChemiFast, WestDura, ECL, ECL Plus	No	Yes	Yes	Yes	Yes
<b>Fluorescence</b> Using transmitted 302nm UV Ethidium Bromide, Gel Red, ProQ Diamond, Deep Purple	Yes	Yes	Yes When fitted with transilluminator	Yes	Yes
<b>Lighting options</b>					
<b>Fluorescence</b> Using Epi 365nm UV option QDots*, TLC, ECL Plus	Yes	Yes	Yes	Yes	Yes
<b>Fluorescence</b> Using Epi Blue LED (480nm) option Alexafluor 488, Cy2*	Yes	Yes	Yes	Yes	Yes
<b>Fluorescence</b> Using Epi Green LED (540nm) option Alexafluor 546, Cy3*, HEX, TAMRA	Yes	Yes	Yes	Yes	Yes
<b>Fluorescence</b> Using Epi Red LED (640nm) option Alexafluor 647*, Alexafluor 633, Cy5*, BODIPY 650	Yes	Yes	Yes	Yes	Yes
<b>Fluorescence</b> Using Epi Near IR (740nm) option Alexafluor 700, Alexafluor 750, Cy7	No	Yes	Yes	Yes	Yes
<b>Fluorescence</b> Using Epi LY680 option IR Dye 680, IR Dye 700	No	Yes	Yes	Yes	Yes
<b>Fluorescence</b> Using Epi IR (780nm) option IR Dye 800, AlexaFluor 790	No	Yes	Yes	Yes	Yes
<b>White light imaging</b> Using conversion screen option with transilluminator Coomassie blue, Silver stain, X-ray film	Yes	Yes	Yes When fitted with transilluminator	Yes	Yes
<b>Blue transilluminator</b> Using blue light converter option with transilluminator or blue light transilluminator option SYBR stains, Gel Green	Yes	Yes	Yes	Yes	Yes

\* EF<sup>2</sup> may require stronger signal

The above is a brief sample of the dyes that can be used with a G:BOX. For a full list of dyes, lighting and filter choices please use our online Product and Applications Selector at [www.syngene.com](http://www.syngene.com)