

Risk Assessment Form

Procedure	Use of GBOX CHEMI XRQ
------------------	-----------------------

Name(s) of person performing the work	Users (Lab manager & Lab Technician & Tenants)		
Name & position of assessor	Khwaja Islam & Laboratory Manager	Signature	
Date of assessment	01/10/2018	RA Number	BioE 0019

Outline of procedure / activity:

The GBOX system (Syngene) is high resolution, multi-application image analysis systems. GBOX can be used for a wide range of imaging applications including; chemiluminescence, fluorescent blots and gels, visible blots and gels, and even 2D gels.

The basic G:BOX Instrument comprises two main components:

Darkroom - this provides a completely black environment into which the sample to be imaged is enclosed. Samples can be placed into the Darkroom directly onto a screen, a transilluminator or a white light pad. The affordable models in the GBOX range utilise the standard sized Darkroom. The optimum models utilise the extended Darkroom, which has a fully variable, motor driven stage, which is controlled by the GeneSys software.

Imaging System - samples are illuminated with a specified light source or sources and imaged directly or through specified filters. Six types of light source are available:

- LED lights of known wavelengths (red, green, blue and IR) located high up on the sides of the Darkroom. These illuminate the sample from above. These are modular units, replaceable by the operator.
- UV lamps of known wavelengths (254-nm, 302-nm and 365-nm) located above the LED light modules on either side of the instrument. These illuminate the sample from above.
- Blue LED lights on transilluminators, providing side and through lighting of samples.
- UV lights on transilluminators, providing side and through lighting of samples.
- LED lights and fibre optics on an edge light unit, for illuminating gels from the edge.
- A white light pad, an alternative to using a visible light converter screen over the UV transilluminator.

In addition, white LED lights are provided on each side of the Darkroom to provide general illumination when positioning and setting up samples.

Between the Darkroom and the lens/camera there is a rotating screen with spaces for up to 7 filters to be inserted. The screen is indexed, enabling the location and specification of each installed filter to be specified

to the GeneSys software.

GBOX Instruments have a new generation of camera - having 3.8, 4, 4.2, 6 or 9 million pixels, giving the system range outstanding sensitivity and versatility.

The GBOX chemi XRQ is located in the innovation lab 2 (696.10.22). It consists of standard dark room (epi white lighting), camera with lens, and UV filter and UV Transilluminator. Also optional extras such as: GX-CONVERT5, HILED-RGBIR, PC-STD, FILTLY800-GXM, FILT525-GX, FILT605-GXM and FILT705-GXM.

Operator must be trained in operating GBOX chemi XRQ to guarantee safe daily use. Untrained Personnel are not be allowed to operate the GBOX chemi XRQ. Users should operate the GBOX chemi XRQ according to instructions in the manual.

Operation of GBOX chemi XRQ refer to user guide. Do not remove the transilluminator from the imaging system darkroom, as there is **no** UV blocking cover on the transilluminator. To protect the filter minimize moisture and liquids on the glass.

Note: UV transilluminator are powerful sources of UV radiation that will cause damage to unprotected eyes and skin.

UV Safety:

The G-box imaging system has UV transilluminator. If one opens the door the image capture software should automatically switch off the UV as a safety precaution. If you wish to override the UV press light bulb button on the 'sample position screen' for excising bands from gels. **Note:** The door safety interlock is reset when you close the door.

To manually override the UV light i) the door open – there are two white pins visible – the **lower** one can be pulled out slightly until it clicks – then there is a square black UV button above that can be pressed for 2 seconds which will turn **ON** the UV light with the door open. UV protected full face shield and UV protected safety goggles must be worn. Also should consider wearing appropriate clothing to protect potential exposure to the area of the skin (for example arms and hands). When excising gel it is recommended to place gels on a UV transmitting gel tray to protect the filter surface area from cuts and scratches. It is recommended that lab gloves be worn to avoid contact with gel & staining agents.

Cleaning a G:BOX Instrument:

A GBOX Instrument does not require regular maintenance or calibration other than occasional checking and cleaning. Switch off the instrument and unplug the mains power cord from the electrical supply.

The outside of the GBOX Instrument can be cleaned using a soft lint-free cloth, moistened if required with a little water. Mild detergent may be used, if necessary. Do not use abrasive or solvent based cleaning materials which can damage the UV filter surface. Always perform a patch test on an inconspicuous area before you clean the entire surface.

Surfaces which may become contaminated with biochemical materials/reagents, e.g. the interior surfaces of the Darkroom, the Black Tray or a transilluminator module, can be cleaned using a soft lint free cloth and a non-fluorescent cleaning agent such as; a neutral detergent or 70% ethanol solution.

Avoid spilling any liquid into the body of the instrument and clean any external spills immediately. If any liquid enters the main body of the instrument, make the instrument inoperative and contact the supplier.

Safety precaution:

- Switch off the mains and remove the mains cord before cleaning.
- Ensure that all instrument users read and understand the precautions listed in user manual.
- Never remove the side or back panels of the GBOX System without first shutting down the instrument and disconnecting the mains cord.
- G:BOX Systems should only be used under the following conditions:
 - I. Indoors.
 - II. In ambient temperatures between 5°C and 40°C.
 - III. With relative humidity below 80% for temperatures up to 31°C, decreasing linearly to 50% relative humidity at 40°C.
- Whenever circumstances arise that mean a GBOX System may be unsafe, make it inoperative. In particular, a G:BOX System may be unsafe if it:
 - I. Shows visible damage.
 - II. Fails to perform the intended measurement.
- Lethal voltages are present at certain points within the instrument.
- When the instrument is connected to mains power, removing the instrument covers is likely to expose live parts.
- Even when the power switch is off, high voltages can still be present – capacitors within the instrument may still be charged even if the instrument has been disconnected from all live voltage sources.
- Any interruption of the protective conductor inside or outside the GBOX System, or disconnection of the protective conductor terminal is likely to make the instrument dangerous.
- Intentional interruption of the protective conductor is prohibited.
- Ensure that the mains supply socket on the instrument is not obstructed, i.e. leave a gap to allow easy disconnection of the mains cord.
- If the mains power cord has to be replaced, ensure that the replacement cord is appropriately rated and approved for the intended use.

Potential hazards

Substance or item handled	Associated Hazard (s)	Existing Control Measures	Risk (L/M/H)	Further Action required	Risk (L/M/H)
Use of UV Light – GBOX imaging system	UV radiation – damage to eyes and skin.	All operators should be trained on proper operating procedures before operating the GBOX system. Wear PPE (lab coat and lab gloves and safety specs). UV Safety: the GBOX System uses epi mid wave UV tubes and the UV transilluminator is inside the GBOX. If the drawer is opened the image capture software will automatically switch off the UV light. Never look directly at the UV light.	L	No further action required if the existing control measures are adhere to.	L
Excising the gel – UV light on (overriding the UV safety switch)	UV radiation – damage to eyes and skin.	UV protected full face shield and UV protected safety goggles must be worn. PPE – lab coat and lab gloves. Also should consider wearing appropriate clothing to protect potential exposure to the area of the skin (for example arms and hands).	M	No further action required if the existing control measures are adhere to.	M
Working with gel and blots	Biohazard risk	Wear proper PPE; gown (lab coat and lab gloves and safety specs). Users will have	L	No further action required if the existing control measures	L

		a risk assessment / SOP in place before work begins.		are adhere to.	
Use of 70% ethanol to clean the GBOX imaging system	Highly flammable	PPE must be worn all the time (lab coat, lab gloves and safety glasses). Refer to COSHH assessment 0003.	L	No further action required if the existing control measures are adhere to.	L
Use of GBOX imaging system	Electrical hazard - Electrical shock – danger of death.	Only switch on the device if the device and power cable are undamaged. The device has been properly installed and there is a preventative maintenance in place. Only trained personal are allowed to use the machine. Incubator is earthed, protective earth connection for the machine is provided using 13A plug fitted to the machine (RCD protected). Make sure it has been PAT tested.	L	No further action required if the existing control measures are adhere to.	L
Ergonomics	Poor Posture and awkward positioning - musculoskeletal disorders (MSDs). Prolong use of the GBOX and DSE without breaks - Eye strain and associated	Adjustment of the chair and DSE by each user. Maintain an upright posture at all times when working on the PC. Chair should be adjusted by the user so the back is straight, the head is upright. Take regular breaks from the GBOX and DSE. Refer to Lab ergonomics (OHS Memo M3/07).	L	No further action required if the existing control measures are adhered to.	L



	headaches.				
--	------------	--	--	--	--

Persons potentially at risk:

Only the user or others near by

Action in event of an accident or emergency:

1. **Fire:** raise the fire alarm and evacuate the area. Use correct fire extinguisher if you have been trained and it is safe to do so.

Arrangements for monitoring effectiveness of control:

Daily inspection of equipment and collection bottle by lab technician.

Annual preventative maintenance carried by external contractor.

Instruction and training given to all operators which is reviewed annually.

Existing operators receive annual refresher training.

Annual pat testing by external contractor.

**Arrangements for monitoring effectiveness of control:
Review of the Risk Assessment:**

Date of review		Name of reviewer	
Date of next review		Signature	

Have the control measures been effective in controlling the risk?

Yes	No
-----	----

Have there been any changes in the procedure or in the information available which affect the estimated level of risk from the listed substances

Yes	No
-----	----

What changes to the control measures are required?

--

Declaration by Tenant/Licensee/Technician:

I confirm that I have read this Risk Assessment and that I understand the hazards and risks involved and will follow all of the safety procedures stated. Where PPE has been identified as a control measure, I will ensure that it is worn.

Declaration by Laboratory Manager (LM):

I confirm that the tenant/licensee/technician who has signed below is competent to undertake the work. My counter-signature indicates that I am happy for the work to proceed.

Name (Please print)	Signature	LM Countersignature	Date



Name (Please print)	Signature	LM Countersignature	Date