

# Gel Documentation System SOP

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## Purpose

To provide instruction for the proper use of the gel documentation system (GelDoc).

## Scope

All users of the gel documentation system within the College of Biological Science should be familiar with the procedures outlined below.

## Definitions/Acronyms

***EtBr*** – Ethidium bromide is used as a fluorescent dye in molecular biology laboratories. It acts by inserting itself between nucleic acid strands (intercalates) and acts as a frameshift mutagen.

## Requirements/Policies/Regulations

- Occupational Health and Safety Act R.S.O. 1990, c. O.1
- R.R.O. 1990, Reg. 851, Industrial Establishments
- University of Guelph Safety Policy [851.07.01](#) Equipment Standards, Authorization and Use (June 2017)

## Training

### Training and competency:

WHMIS and Lab Safety training are required.

All operators must receive training on the safe use of the GelDoc prior to using the equipment. Training may be delegated to a qualified individual, but it remains the responsibility of the supervisor to ensure their personnel are adequately trained.

## Safety Precautions

- ⚠ Ethidium bromide is a known mutagen. Always wear a lab coat, goggles and gloves when handling ethidium bromide solutions and stained agarose gels.
- ⚠ UV light is harmful to the skin and eyes. Do not look into the UV light source without face or eye protection.

## Description of the Task

### Preparation:

- Transport the stained gel in a sealed rigid container, so that it can be carried without gloves.
- It is also permissible to use the “one-glove” technique:
  - Remove the glove from your dominant hand. Use the ungloved hand to open all doors and carry the gel (placed in a secondary container) in the gloved hand.
  - Open the door to the exposure chamber with the ungloved hand. Place the gel into the exposure chamber using the gloved hand and a spatula.
  - Use the ungloved hand to manipulate all controls on the GelDoc (procedure below)
  - Sign the log book with the ungloved hand.
  - When documentation is complete, open the chamber door with the ungloved hand and remove the gel with the gloved hand and a spatula.
  - Using the gloved hand, wipe the glass surface of the GelDoc with a Kimwipe
  - DO NOT use a paper towel as over time this scratches the glass
  - Use the gloved hand to carry the gel back to your laboratory, opening all doors with the ungloved hand.

### Procedure:

Ensure you are wearing a lab coat, closed toed shoes, gloves and eye protection.

#### 1. *Launch the software:*

- Ensuring you are using an ungloved hand, click the mouse to activate the monitor.
- Open the GelDoc software if it is not already open.
- On the menu bar, select ‘File’, toggle down to ‘Acquire’ and select ‘GelDoc’.

#### 2. *Positioning the gel:*

- Open the chamber door with the ungloved hand and with the gloved hand load the gel into the chamber. Centre the gel, using the monitor to assist in visualization.
- Close door and switch on the UV light.
- With an ungloved hand, adjust the focus, zoom and aperture on the camera to obtain the optimal image.
- In the GelDoc window, click ‘Capture’. Select the hatched-box icon in this window and drag it to select the area of interest.

- On the menu bar, select 'Edit' and cursor down to 'Extract'. A new window will appear with the final picture. You may wish to adjust the image properties such as brightness and contrast.

### 3. *Printing:*

- On the menu bar, select 'File', cursor down to 'Video Print' and click to print.
- If the paper roll has a pink stripe, obtain a new roll from the Chemistry Stockroom and install as per the directions on the printer.
- Close the windows containing the extracted and original images, Click 'Don't Save' in the pop-up dialog box.

### 4. *Closing the program:*

- Turn off the UV light.
- With a gloved hand, remove your gel from the chamber and wipe down the glass surface of the GelDoc with a Kimwipe.
- Close the door to the chamber with the ungloved hand.
- Record your name and the number of photos taken in the log book.

## Contingency Plan and Reporting

### Equipment Malfunction:

If the software fails to launch, try restarting the computer. Quite often after power outages or brown outs, the system fails to launch properly.

Problems with the UV light source should be reported to your supervisor.

### Incident Response:

If EtBr solution comes in contact with your skin, wash the area thoroughly with soap and water. Inflammation and discolouration of the skin may occur after contact.

If EtBr solution comes in contact with your eye, irrigate immediately at the designated eye wash station. Flush for 20 minutes into open eye.

Complete the [Incident Report Form](#) to report the spill or incident to your supervisor and EHS.

### Spill Cleanup:

If the gel is dropped or the staining solution was spilled:

- Cordon off the area of the spill. Ask for assistance from those nearby if necessary.

- Ensure you are wearing a lab coat, closed toed shoes, gloves and eye protection.
  - If the spill occurred on benchtop, remove the affected section and place in a leak proof bag or waste container identified for EtBr waste.
  - If the spill occurred on a hard surface:
    - Absorb any liquid/gel with paper towels or absorbent pads.
    - Place used materials in a leak proof bag or waste container identified for EtBr waste.
    - Decontaminate spill area as described below.

If EtBr powder is spilled:

- Avoid raising dust when cleaning solid spills by mixing with water and then absorbing the solution. All spill cleanup materials and absorbents should be placed in EtBr designated waste bins. Follow with decontamination as described below.

### Decontamination:

To decontaminate the area, it is recommended that a solution of sodium nitrite and hypophosphorus acid be used. Add 4.2g sodium nitrite and 20 mL of hypophosphorus acid to 300mL of water. Alternatively, a 10% bleach solution can be used.

- Soak a paper towel with the decontamination solution and wash the affected area.
- Use a UV-light to locate any remaining EtBr.
- Use water and paper towel to clean area again. Rinse the area a few times to be sure any residue has been cleaned up.
- Place all used material in the EtBr waste and submit a [Chemical Waste Disposal Request form](#) to EHS.

## Waste Management and Environmental Responsibility

Place used materials (gels, paper towels, benchtop) in waste container lined with a leak proof bag and labelled as EtBr waste. Dispose of waste by sealing bag and tagging with yellow hazardous waste disposal tag. Complete [Chemical Waste Disposal Request](#) and submit to EHS.

Buffer solutions can be collected in appropriate containers and tagged for disposal as hazardous waste, or filter the solution using commercially available filter or activated charcoal filtration. Filtrate may then be disposed of down the sink. Spent filters to be disposed of as hazardous waste.

## References/Material/Resources

- Safety Data Sheets
- GelDoc manual from manufacturers
- [Ethidium Bromide Disposal Guideline](#)

## Distribution of Copies

Document accessible on [CBS website](#)

## SOP History

Gel Documentation System SOP v 16-Jan-2008 prepared by A. Doane.

### Reason for Changes:

Reformatting to meet AODA compliance

### Review Frequency:

All CBS SOP's are to be reviewed every two years or as changes in legislation or procedures necessitate.