RISK ASSESSMENT – TASK BASED
IGEM 2016

Location:	**Building Number:**	**Date:**	**Assessed By:**	**Health & Safety Representative:**
Room W301, Medical Building	**181**	**February 2016**	**Amber Willems Jones**	**Vincé Kalangi**

Description of Activity: **4.1 Agarose Gel Electrophoresis** **SWP No:** 4.1	
Is there past experience with the Activity that may assist in the risk assessment? Incidents & Near-hits, Incident Investigations, Workplace Inspections, Training, Standards, Legislation & Codes, Uni Guidance Material, Existing Controls, Industry Standards.	NO

1.TASK	**2.HAZARD**	**3.Estimated RAW RISK SCORE C x E x L**	**4.CONTROLS**	**5. Residual Risk Score RISK SCORE C E L C x E x L**				**6. Residual Risk**
Preparation of Gel	Skin contact with acrylamide	15x6x1	Personal Protective Equipment ; training	15	6	0.1	4.5	low
Preparation of Running buffers	Skin contact with SDS, Tris, Glycine	1x6x1	Personal Protective Equipment ; training	1	6	0.1	0.3	low
	TOTAL	96		TOTAL			4.8	Low risk

Name & Signature of Laboratory Head/Supervisor or Delegate	Amber Willems Jones	Date	
Name & Signature of Person Performing Activity or Task		Date	

Number and Title	PRG 4.1 Agarose Gel electrophoresis
Name of Laboratory/Department	The University of Melbourne IGEM Team Laboratory/ Department of Biochemistry
Author, Date Prepared & Date of Review	Author: Ella Bocquet-Gaylard Date: 22/2/2016 Updated : February 2016, Review by: February 2018
Introduction	Agarose gel electrophoresis is the easiest and commonest way of separating and analyzing DNA. The purpose of the gel might be to look at the DNA, to quantify it or to isolate a particular band. The DNA is visualised in the gel by addition of RedSafe^{TM}.
Principles / Scope	This SWP describes the steps to follow in order to perform a DNA Agarose gel electrophoresis. This procedure contains buffer and sample preparation, how to visualize the DNA bands
Risk Management	***Risk assessments have been prepared and are available attached to the SWP*. Raw Risk: low Residual Risk: low**
Safety Management	**Hazards: Wear PPE** **Risk Controls: Low Risk**
Licences / Permits	N/A
Training / Competency	All team members must be inducted to the use of any Equipment used.
Equipment	Gel electrophoresis equipment Power supply
Protocol	PC1 procedures to be followed throughout. Standard PPE to be worn throughout this procedure. *The ingredients shown here are for a 1 % (w.v) agarose gel. Materials Tris base Boric acid EDTA SYBERsafe - Invitrogen Loading dye (Ficoll 400 and bromophenol blue) Agarose Gel electrophoresis equipment Power supply Tris borate EDTA (TBE) 54 g Tris base 27.5 g Boric acid 20 mL 0.5 M EDTA pH 8.0

	10x loading dye: 7.5 g Ficol 400 0.125 g Bromophenol Blue
Step 1	Measure out 100 mL of TBE in a conical flask (see below for buffer components).
Step 2	Weigh out 1 g agarose.
Step 3	DO NOT stir. Place in microwave for 1 min, ensuring that the liquid does not boil over the sides of the flask.
Step 4	Remove flask from microwave and determine if agarose has completely dissolved. There should be no crystalline particles in the bottom of the flask; it should be completely clear. Cool the liquid so that it can be held in the hand by pouring tap water over the flask.
Step 5	Add appropriate amount of RedSafe™ for the gel. (refer to manufacturers guide)
Step 6	Pour the liquid into the electrophoresis apparatus and insert the comb.
Step 7	If the agarose used was low-melt, it will take 30-40 mins to set. If normal agarose was used, the gel will set in 5-10 mins.
Step 8	Carefully remove the comb from the gel.
Step 9	Place the gel apparatus in the plastic tank where electrophoresis is to be carried out and make sure the gel is completely submerged in TBE buffer and that the wells are filled with buffer.
Step 10	Load the samples with appropriate volume of loading dye.
Step 11	Set the gel to run at 100 - 120 V. (usually takes about 30 min)
Step 12	Once the run is finished, check whether the dye front has reached the bottom of the gel, and that there is adequate separation.
Step 13	Remove the gel from the apparatus and either extract the DNA from the gel or visualise the gel.
Step 14	Discard the gel in a biohazard bin or label and store appropriately.

Controls / Calibration	N/A
Waste Disposal	Gel should be discarded in the biohazard bin
Emergency Procedures	First aid measures Eye contact: Immediately flush eyes with plenty of water for at least 20 minutes and get medical attention. Skin contact: In case of contact, immediately flush skin with plenty of water for at least 20 minutes. Inhalation: Move exposed person to fresh air. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. Get medical attention. Ingestion: Wash out mouth with water. Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Call medical doctor or poison control centre immediately.
References	
Authorised By	Amber Willems Jones