

Environmental Health Risk Management Plan (EHRMP)

Guru Gobind Singh Indraprastha University (GGSIU)

Proposal entitled: Development and evaluation of antigens to capture antibodies on Lateral flow Immunoassay device for the screening of Covid19 infection

- (i) Brief description of the proposed activity
The proposed work involves use of strains of *E.coli* for cloning, expression, production and purification of recombinant antigens. Biocontainment required for this project is available and biowaste produced will be segregated and disposed through approved vendor.
- (ii) List of environment related regulatory clearances required for the activity.

Institutional Biosafety Committee Approval for use of recombinant microbes and RCGM

Institutional Arrangement

Area of Risk		Yes	No	Details	Proposed Plan
1.	Is there a designated full-time staff for Environment Health and Safety (EHS) issues?		√	No exactly with such designation, but a Biomedical officer from university health Centre take care of such responsibility	Based on the Project requirement a Consultant will be hired on need basis. The proposed project elements will be covered by any committees/agencies within GGSIPU and a dedicated quota of man-hours will be given for the Project as required.
2.	Does the EHS staff handle the following?			Biomedical office from university health Centre is also member of IBSC. Thus consent regulatory clearances as well as record keeping of accidents	Necessary and mandatory approvals will be taken as and when required. Regular EHS training will be carried out at regularly intervals as and when any new staff joins.
	Occupational Health and Safety	√			
	Waste Management	√			
	List of consents and regulatory clearances	√			
	Record keeping of accidents and procedures	√			
	EHS trainings for staff		√		
	Environment Management Framework compliance for Innovate in India Project		√		
3.	Is there a reporting structure in place regarding EHS issues?		√	Structural reporting is not yet in place. Currently EHS staff is not available. It is	We will make a plan for EHS issues with a proper structure in place.

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				taken care Institutional Biosafety committee and Biowaste management committee and as well as university works department	
4.	Are regular EHS trainings provided to staff?		√	Frequency: As and when required	Staff EHS trainings are planned which will be as per the guidelines provided by SPCB.at least yearly training.
5.	Institutional Bio-Safety Committee (IBSC)	√		Review and approve the projects related to biosafety with at least two meetings in a year	Now, we are switching completely to digital one though IBKP portal of DBT with periodic review. Research Unit will comply with Bio-Safety Committee requirement throughout the project.
6.	Ethics Committee (EC)	√		Review and approve the projects related to research involving human subjects with at least one meeting in a year	The Ethics Committee will be scheduling meetings regularly depending on the requirement. During the meeting, the members will review the new project proposals and also review the progress of the ongoing projects. They will review the ethical and the informed consent related issues pertaining to research project.
General Occupational Health and Safety					
	Area of Risk	Yes	No	Details	Proposed Plan
7.	Are there Standard Operating Procedures for accidents, hazards, and other emergencies (chemical	Yes		Procedures for handling corrosive chemicals, chemical	A structured system is not in place. However we will try to set up

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	spills, heat hazards, fire hazards, radioactive hazards etc.)?			spill as well as fire extinguisher are in place	structured quality system in a year or two.
8.	Are the following in place?			All scientific and technical staff uses Lab aprons. Eye wash and Shower stations are available in nearest washroom.	Till now, No hazardous chemicals were used in laboratory. Therefore we didn't have chemical spill kits. However, we will try to place to chemical spill kits in the next six months time frame.
	Chemical spill kits		√		We don't register small accidents and injuries.
	Eye wash	√			We will maintain a record in future.
	Shower stations	√			
	First Aid Kit	√			
	Fire Extinguishers	√			
	Register of accidents and injuries		√		
9.	Are proper signage and storage system in place?	√		Till now, not required to display. However, MSDS are available and maintained in file with core team members handling chemicals.	Research Unit will comply with organization policy and maintain a proper regulation of these requisites.
	Display of Material Safety Data Sheet (MSDS) where relevant		√		
	Display of emergency numbers and procedures (Person to Contact, Doctor, Ambulance, Fire Emergency, Police) displayed in all critical places	√			
	Signage across the facility (labs, storage, hazardous areas, etc.)	√		Yes we have dedicated storage area for flammable materials.	
	Are flammable materials appropriately stored to prevent fire hazards?	√			
10.	Are smoke detectors, fire alarms, automatic safety/shut off systems, overflow preventors, etc. in place and regularly maintained?		√	We don't have automatic systems but systems are in place and run manually	We will discuss the requirement and suggestion with competent authority and put the measures in place.
11.	Are there control measures for VOC, air emissions, high operating temperatures, pathogens/vectors etc. in place?	√		We have chemical hoods and Biosafety cabinets to handle VOC and air emissions and Pathogens	The SOP will be followed.

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12.	Are regular mock drills conducted for emergency preparedness and safety?	√		Setup has mock drills for fire safety once in year	We proposed to have mock drills/ training to handle other type of accidents also other than fire safety.								
13.	Are staff provided with OHS training?	√		Students/regular staff during lab courses were taught about safety procedures	Temporary Staff/ visitor joining the lab will have training at the time of joining								
Biomedical Waste (BMW)													
	Area of Risk	Yes	No	Details	Proposed Plan								
14.	Is there generation of biomedical waste (as described in Bio-Medical Waste Management Rules, 2016) in the grantee?	√		As part of research following biomedical waste is generated Droppers, Sample applicators, vacutainers, Microcentrifuge tubes, tips, gloves and mask Microbiological plates, Cell culture flasks etc	The proposed plan is to dispose any kind of biomedical waste as per the BWM Rules, 2016.								
15.	Is there trained staff to handle biomedical waste in the grantee?	√		Yes, staff working in lab is trained to handle and segregate	Will ensure that this is followed regularly throughout the project.								
16.	Has the grantee obtained authorization from State Pollution Control Board /Pollution Control Committee?		√	Process was initiated in October 2019 for authorization from SPCB. However it cannot be completed due to covid	All approvals from competent authority has been completed Authorization will be completed in first week of December.								
17.	Is the biomedical waste segregated at point of generation in the facility and stored in suitable containers?	√		<table border="1"> <tr> <td>Yellow</td> <td></td> </tr> <tr> <td>Red</td> <td>Yes</td> </tr> <tr> <td>White</td> <td></td> </tr> <tr> <td>Blue</td> <td></td> </tr> </table>	Yellow		Red	Yes	White		Blue		Red bag for biohazardous waste are made available for segregation. This process of segregation will be followed throughout the project.
Yellow													
Red	Yes												
White													
Blue													
18.	Is the bar code system for the segregated waste in place?		√	Amount of waste is small i.e. less than a kg per month. Inventory is not maintained for waste									

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19.	Is the biomedical waste being sent to an authorized common BMW facility?		√	<p>Name and address of CBMWF: M/s SMS WATER GRACE BMW PVT. LTD., having its office at Sewage Treatment Plant, Delhi Jal Board Complex, Nilothi, New Delhi- 110041</p> <p>Distance from facility: 12</p> <p>Frequency and Mode of transport: at least weekly through Road</p> <p>Who transports? BMW facility personnel</p>	In house Biomedicals waste Management by autoclaving before handling the waste to MCF Waste.
20.	Does the grantee have an in-house BMW treatment facility?		√		In house autoclaving will be done. The BMW will be carried and treated by the In house authorized people and we will keep a record of these.
	Is the treatment facility own (individual)?		√		
	Is the treatment facility a shared facility in an industrial park?		√		

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21.	Are lab waste, microbiological waste and chemical liquid waste pre-treated before storing and sending to treatment facilities according to guidelines prescribed in BWM, 2016 regulations?	√		Autoclaving	ETP Treatment plant installed in our facility. The treatment techniques used currently will be followed in the future also. Compliance calendar shall be maintained.
22.	Is the liquid waste checked for active cells before sending to treatment plant?		√		All the liquid waste discarded with Sodium hypochlorite treatment.
23.	Are necessary waste pre-treatment equipment in place?	√		Autoclaves	Pre-Treatment will be done by decontamination by our staff regularly.
	Do the equipment adhere to prescribed norms by State Pollution Control Board (SPCB)?	√			
24.	Are chlorinated plastic gloves and bags phased out in the grantee?		√		Decomposed in regular waste after sodium hypochlorite treatment.
25.	Are grantee's personnel involved in handling BMW provided with regular training?	√		Weekly routine followed for handling BMW in lab	Regular training will be given to all the personnel and all the stakeholders will be trained to handle BMW.

26.	Are medical examination provided to personnel involved in BMW waste handling and are they provided with relevant immunization like Hepatitis B and Tetanus?		√	Frequency of medical examination:	A proper mechanism will be put in place with regular monitoring.
27.	Is a daily register for biomedical waste maintained including accident reporting record?	√		Not. maintained	We will prepare a daily register with regular updates and maintenance of records.
28.	Are annual reports on BWM submitted to SPCB as per required form (see Bio-Medical Waste Rules 2016)?		√		Will ensure proper and regular submissions during the project.

Hazardous Waste (HW)

Area of Risk	Yes	No	Details	Proposed Plan
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29.	Is there generation of hazardous waste (as per Hazardous Waste Rules, 2016) in the grantee?		√		If any hazardous waste is generated as per rules it will be handled and disposed.
30.	Is there trained staff in the facility to identify and handle hazardous waste?	√		Academic Faculty are available	As and when required a staff will be trained to treat and handle the hazardous wastes.
31.	Does the grantee have authorization from SPCB for hazardous waste?		√		Necessary Authorizations will be taken if required.
32.	Is there a secure location for storage of HW with proper signage?		√	Describe how each item is stored – platforms, distances from critical installations/movement areas, spill collectors, gas escape facility, etc.	We will arrange proper storage facilities when required
	Are hazardous waste stored for more than 90 days in the grantee's premises?		√		
33.	Is the hazardous being send to an authorized disposal facility or user?		√		Hazardous waste will be sent to authorized recycler if generated
	Is the disposal facility in house?		√		
	Is the disposal facility external/outsourced?		√		
34.	Is a register maintained on production and treatment, and a manifest system followed for transport of hazardous waste from the grantee to treatment facility?		√		We will maintain the register when required

E-Waste and Batteries

	Area of Risk	Yes	No	Details	Proposed Plan
35.	Does the grantee generate e-waste, produce or manufacture electrical and electronic equipment?		√	No substantial electrical waste is generated in the lab	Procedures will be followed as per the guidelines.
36.	Has the grantee obtained SPCB authorization on e-waste?		√	No substantial electrical waste is generated in the lab	Necessary Authorizations will be taken if required.

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37.	Does the grantee channelize the e-waste to authorized recycling or disposal facility?		√	No substantial electrical waste is generated in the lab	
38.	Does the manufacturing grantee have Extended Producer Responsibility system and EPR-authorization in place?		√	No substantial electrical waste is generated in the lab	
39.	Does the grantee practice reduction in the usage of hazardous substances in the manufacture of electrical and electronic equipment and its parts?		√	No substantial electrical waste is generated in the lab	
40.	Does the grantee provide detailed information on the constituents of the equipment and their components/spares and declaration of conformation to Reduction in Hazardous Substances in the product user documentation?		√	No substantial electrical waste is generated in the lab	
41.	Does the grantee maintain a record of collection, storage, sale and transport of e-waste?		√	No substantial electrical waste is generated in the lab	
42.	Does the grantee submit annual reports on e-waste to SPCB?		√	No substantial electrical waste is generated in the lab	
43.	Is there accident reporting and records in place?		√	No substantial electrical waste is generated in the lab	
44.	Are PPEs available to staff?		√	No substantial electrical waste is generated in the lab	The stock status of PPE will be regularly monitored and procurement will be done in time to avoid any situation of stock out.
45.	Is the grantee involved in manufacture of batteries?		√	No substantial electrical waste is generated in the lab	
46.	Does the grantee generate battery waste?		√	No substantial electrical waste is generated in the	

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				lab	
47.	Does the grantee deposit the battery waste to registered recycler/dealer/manufacturer/reconditioner/collection center?		√	No substantial electrical waste is generated in the lab	
48.	In case of manufacturing, does the grantee comply to Battery Management Rules 2000 and ensure collection of old batteries?		√	No substantial electrical waste is generated in the lab	
Community Health and Safety and risk mitigation					
			Yes	No	Details
					Proposed Plan
49.	Safety Transportation Management System (for transport Of hazardous material)		√	Only autoclaved material is disposed off.	Will follow the safety transport management system if required
50.	Emergency preparedness and participation of local authorities and potentially affected communities		√		Will develop the emergency preparedness plan if required

Other					
	Area of Risk	Yes	No	Details	Proposed Plan
51.	Does the grantee use any radioactive materials (isotopes tracers, radiation equipment, etc)?		√		we don't use radioactive material
	Does the grantee have appropriate radioactive material and waste storage and disposal system in place?		√		If we use, then we will arrange for proper storage and disposal
	Are radioactive warning signs in place?		√		Will be implemented if required
52.	Is the lab/room air regularly checked for microbial contamination?		√	No microbial work is done in the lab	Will be implemented if required
53.	Are there any odor control measures in place?		√		Periodic checks will be done preventive measures will be taken if required
54.	Are fume hoods and exhausts regularly checked and maintained?	√		Exhaust installed and checked in dedicated area.	Periodic checks will be done
55.	Does the grantee use DG set > 15 KVA?		√	We use electricity	DG sets emissions will be regularly monitored as per
	Does the grantee have consent for DG > 15 KVA?		√	supplied through state	

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	Are emissions from boilers and DG sets regularly monitored to be within the prescribed norms?	√	electricity distributors.	CPCB norms if procured
56.	Does the grantee have proper disposal process for solid and plastic waste in compliance to Solid Waste Management Rules, 2016 and Plastic Waste Management Rules, 2016?	√	Describe: It will be ensured that segregation rules are followed	This will be maintained and monitored
57.	Is wastewater treated separately by the grantee? (Liquid waste from laboratory, chemicals, fluids, solvents, medium and cultures, coolants, etc.)	√	Chemical waste is treated by ETP Plant. Chemical management in wastewater treatment plants: By ETP Plant	
	Are there sludge management and cut off drains in place for wastewater?	√	No, Regular waste is disposed in sewer drainage	
58.	Are necessary provisions for noise cancellation in place?	√	No noise is generated in the company.	Preventive measures will be taken for reducing noise levels if generated
59.	Are there any settlements, water bodies, cultivated land, or any other eco-sensitive areas near the grantee's premises?	√		
60.	Are there any buffers, fire vehicle routes in the grantee's premises?	√	Fire vehicle routes are available	
COVID Precautions & Guidelines Implementation				
61	Guidelines of CPCB/SPCB/GoI for Handling, Treatment, and Disposal of COVID Waste Generated is whether being followed?	√	Training provided on Covid to all the staff.	Masks and gloves are used inside the company.
62	SOP on preventive measures to contain spread of COVID-19 issued by ICMR/GoI from time to time is whether being followed?	√	All the necessary procedures are followed	Regular sanitization in the premises, Thermal screening.

Notwithstanding the above other risk (relevant to the project activities) that will be identified in the course shall be addressed as per standard mitigation monitoring parameters and manner of records keeping shall be in accordance to the recommendations of the project monitoring committee on subject experts engaged by BIRAC.