

Georgia Institute of Technology Biological Risk Assessment Form

Part 1: Laboratory Information

Principal Investigator:

Department:

PI phone #:

PI email:

School:

Location:

Building:

Room:

Building:

Room:

Departmental Safety Officer:

The PI must conduct a laboratory risk assessment specific to activities in their laboratories prior to beginning work in a laboratory. The risk assessment must be reviewed annually by the PI or when a new project is initiated to ensure that the assessment is complete and current. The Risk Assessment identifies hazards to personnel and specifies mitigations to reduce the impact of these hazards. All laboratory staff must be familiar with the risk assessments for the work they will be involved with. The person conducting the assessment must verify at that end that it is complete and reflective of activities in their laboratories.

The majority of PI's will only have one "laboratory" which may encompass multiple rooms but fall under the same scope of work and share the same hazards. In some cases, a PI may have multiple laboratories with substantially different hazards and different scopes of work and will need to have a separate risk assessment for each laboratory.

EH&S personnel are available to assist with completing the Risk Assessment form and will review it once it has been completed.

Part 2: Laboratory Hazard Assessment

The work described includes (check all relevant boxes):

Laboratory Hazard	Yes	No
Biological Materials		
Chemical Hazards		
Radiation Hazards		
Recombinant or Synthetic Nucleic Acids		
Research Animals		

Part 3: Biological Risk Assessment

3.1 Biological Materials:

Microorganisms:

Risk Group ¹	Common Name	Route(s) of Transmission ²	Signs/Symptoms of Disease	History of LAI? ³

¹ <http://osp.od.nih.gov/office-biotechnology-activities/biosafety/nih-guidelines>

² Inhalation, Ingestion, Mucous Membrane Exposure, Percutaneous

³ Briefly describe the history of laboratory-acquired infection

Laboratory Animals: Yes No

If yes, specify species: _____ IACUC Protocol: _____

Recombinant/Synthetic Nucleic Acids/Viral Vectors: Yes No

If yes, specify: _____ IBC Protocol: _____

Cell Culture: Yes No If yes, source organism: _____

Specify: _____

Human or Non-Human Primate Blood/Body Fluids: Yes No

If yes, specify source: _____

Sample matrix: _____

Toxins: Yes No

If yes, specify: _____ Source organism _____

LD50: _____ Max. quantity in inventory: _____

3.2 Biological Activities:

Describe the laboratory activities planned with these materials:

(Please provide a technical description of the lab activities, not the experimental goals)

Do Planned Activities Include:

Inactivation and Transfer?: Yes No Large Scale($\geq 10L$)?: Yes No
Shipping?: Yes No

Equipment Used in Lab Activities with These Materials Include:

<input type="checkbox"/> Centrifuge	<input type="checkbox"/> Plate Washer	<input type="checkbox"/> Cytospin
<input type="checkbox"/> Sonicator	<input type="checkbox"/> Shaker	<input type="checkbox"/> Vacuum Concentrator
<input type="checkbox"/> Pipettes	<input type="checkbox"/> Cell Sorter	<input type="checkbox"/> Autoclave
<input type="checkbox"/> Sharps (needles, scalpels, etc.)	<input type="checkbox"/> Robotics	<input type="checkbox"/> Homogenizer
<input type="checkbox"/> Vortex	<input type="checkbox"/> Aerosol chamber	<input type="checkbox"/> Vacuum/Aspirator
<input type="checkbox"/> Grinder	<input type="checkbox"/> Bead Beater	<input type="checkbox"/> Other

3.3 Biological Risk Mitigation

Engineering Controls – Primary Barriers:

<input type="checkbox"/> Class II BSC	<input type="checkbox"/> Sample transfer container	<input type="checkbox"/> Downdraft table
<input type="checkbox"/> Safety Syringes	<input type="checkbox"/> ventilated animal cage	<input type="checkbox"/> PCR workstation
<input type="checkbox"/> Centrifuge Safety Cups	<input type="checkbox"/> Negative airflow	<input type="checkbox"/> Other: _____

Administrative Controls:

Training:

Please describe site-specific training provided to laboratory members:

Please indicate which EH&S Trainings are required for your laboratory:

- General Biosafety (required for work with biological materials)
- Bloodborne Pathogens (required for work with human blood/body fluids)
- Recombinant DNA (required for work involving recombinant or synthetic nucleic acids)
- Autoclave Training (required for laboratorians who will be using an autoclave)
- Shipping Training (required for anyone who will be shipping materials)

Medical Surveillance:

- Enrollment in Respiratory Protection Program? Yes No
- TB Screening? Yes No
- Required vaccines? Yes No

Contingency Planning:

- EPA-Approved Disinfectant: _____
- Spill Kit Present (including instructions)?: Yes No
- GT Emergency Lab Signage Posted?: Yes No

Personal Protective Equipment*:

- Lab Coat Wrap-around Gown Face Shield
- Safety Glasses Nitrile Gloves N-95
- Latex Gloves Double Gloves Shoe covers
- Other: _____

* Principal Investigators are responsible for ensuring laboratory personnel are provided with appropriate PPE.

Proposed Laboratory Biosafety Level(s):

- BSL1 ABSL1 BSL2 ABSL2 BSL3

Overall Biological Risk:

Using the table on pg. 5, determine the overall biological project risk of release or exposure to biological material:

Severity: Negligible Minor Serious Critical Catastrophic

Probability: Improbable Remote Occasional Probable Frequent

Inherent Project Risk: Low Moderate High

Part 4: Chemical Risk Assessment

4.1 Chemical Hazards

Particularly Hazardous or Restricted Substances:

Please check "Yes" if your laboratory uses or stores any of these chemicals and then indicate the approximate quantity present.

Yes (check)	CAS#	Chemical Name	Approx. Qty	Primary Hzrd (DOT)
	7784-42-1	Arsine		2.3
	1305-99-3	Calcium phosphide		4.3
	7782-50-5	Chlorine		2.3
	107-30-2	Chloromethyl methyl ether		3
	460-19-5	Cyanogen		2.3
	2074-87-5	Cyanogen (CN-55, 945-27)		6.1
	98-12-4	Cyclohexyltrichlorosilane		8
	544-97-8	Dimethyl zinc		4.2, 4.3
	75-21-8	Ethylne Oxide		2.3
	7782-41-4	Fluorine		2.3
	7783.07.5	Hydrogen Selenide		2.3
	7783.06.4	Hydrogen sulfide		2.3
	7439-93-2	Lithium		4.3
	628-86-4	Mercury Fulminate		1.1A
	12542-85-7	Methyl aluminum Sesquichloride		4.2
	74-93-1	Methyl mercaptan		2.1
	60-34-4	Methylhydrazine		6.1, 3,8
	23306-80-1	N,N-diisopropyl phosphoramidic chloride		6.1
	7697-37-2	Nitric Acid (> 50%)		5.1, 8
	627-20-3	Pentene, cis-2-		2.1
	58-39-9	Perphenazine (etrafon) (trilafon)		6.1
	7803-51-2	Phosphine		2.3
	7723-14-0	Phosphorus, powder, red, 99%		4.1
	9/7/7440	Potassium		4.3
	7803-62-5	Silane		2.1
	7440-23-5	Sodium		4.3
	26628-22-8	Sodium azide		6.1
	75-91-2	tert-Butyl hydroperoxide		5.2
	354-32-5	Trifluoroacetyl chloride		2.3

Other Hazardous Chemicals:

Please check "Yes" if your laboratory uses or stores any of these chemicals and then indicate the name and approximate quantity present.

Yes (check)	Chemical Category	Chemical Name	Approx. Qty.
	Explosives		
	Pyrophorics (solid, liquid, or gaseous)		
	Cyanide Compounds		
	Organometalics		
	Reproductive Toxins		
	Carcinogens		
	Chemicals w/ high degree of acute toxicity		
	Other Highly Toxic Gases: (LC50<3000 ppm NFPA Health 3 or 4)		

Nanoparticles: Yes No Organic? Inorganic?

If yes, specify (include CAS# if applicable) _____

3.2 Chemical Activities:

Briefly describe the laboratory activities planned with these materials:

Do Planned Activities Include:

Large Scale($\geq 10L$)?: Yes No

Shipping?: Yes No

Equipment Used in Lab Activities with These Materials Include:

- | | | |
|---|--|--|
| <input type="checkbox"/> Centrifuge | <input type="checkbox"/> Plate Washer | <input type="checkbox"/> Cytospin |
| <input type="checkbox"/> Sonicator | <input type="checkbox"/> Shaker | <input type="checkbox"/> Vacuum Concentrator |
| <input type="checkbox"/> Pipettes | <input type="checkbox"/> Cell Sorter | <input type="checkbox"/> Autoclave |
| <input type="checkbox"/> Sharps (needles, scalpels, etc.) | <input type="checkbox"/> Robotics | <input type="checkbox"/> Homogenizer |
| <input type="checkbox"/> Vortex | <input type="checkbox"/> Aerosol chamber | <input type="checkbox"/> Vacuum/Aspirator |
| <input type="checkbox"/> Grinder | <input type="checkbox"/> Bead Beater | <input type="checkbox"/> Other |

3.3 Chemical Risk Mitigation

Engineering Controls – Primary Barriers:

- | | | |
|---|---|---|
| <input type="checkbox"/> Chemical Fume Hood | <input type="checkbox"/> Flammables Cabinet | <input type="checkbox"/> Other Ventilated Enclosure |
| <input type="checkbox"/> Glove Box | <input type="checkbox"/> Gas Cabinet | _____ |
| <input type="checkbox"/> Acids Cabinet | <input type="checkbox"/> Snorkel/Canopy | <input type="checkbox"/> Other: _____ |

Administrative Controls:

Training:

Please describe site-specific training provided to laboratory members:

Please indicate which EH&S Trainings are required for your laboratory:

- | | |
|--|---|
| <input checked="" type="checkbox"/> Lab Safety 101 | (required for work in a laboratory) |
| <input type="checkbox"/> Right to Know | (required for employees and graduate students) |
| <input type="checkbox"/> Autoclave Training | (required for laboratorians who will be using an autoclave) |
| <input type="checkbox"/> Shipping Training | (required for anyone who will be shipping materials) |

Medical Surveillance:

Enrollment in Respiratory Protection Program? Yes No

Explain: _____

Contingency Planning:

Hazardous Materials SDS Printed & Available? Yes No

GT Emergency Lab Signage Posted?: Yes No

Chemicals barcoded and labeled w/ NFPA diamonds? Yes No

Personal Protective Equipment*:

Lab Coat

Wrap-around Gown

Face Shield

Safety Glasses

Nitrile Gloves

N-95

Latex Gloves

Double Gloves

Shoe covers

Other: _____

* Principal Investigators are responsible for ensuring laboratory personnel are provided with appropriate PPE.

Overall Chemical Risk:

Using the table on pg. 5, determine the overall project risk of release or exposure to chemicals:

Severity: Negligible Minor Serious Critical Catastrophic

Probability: Improbable Remote Occasional Probable Frequent

Inherent Project Risk: Low Moderate High

Part 4: Risk Assessment Review

I agree to follow the guidelines outlined in the Georgia Institute of Technology Biosafety Manual as well as the recommendations outlined in the CDC/NIH *Biosafety in Microbiological and Biomedical Laboratories*. I certify that the information provided above is accurate to the best of my knowledge.

Principal Investigator

RISK MATRIX			CONSEQUENCE				
			INSIGNIFICANT	MINOR	MODERATE	MAJOR	CRITICAL
			Near miss event No injury or illness	First Aid injury / illness Biological / Chemical Spill	Moderate injury / illness Reversible impairment Biological exposure	Serious injury /illness LTI Temporary Impairment* Dangerous Incident	Permanent Impairment Fatality / fatalities
↑ LIKELIHOOD ↑	ALMOST CERTAIN	Extremely likely	MEDIUM	MEDIUM	HIGH	EXTREME	EXTREME
	LIKELY	Will probably occur	LOW	MEDIUM	HIGH	HIGH	EXTREME
	POSSIBLE	Likely to happen but not certain	LOW	LOW	MEDIUM	HIGH	EXTREME
	UNLIKELY	Possible but not likely	LOW	LOW	MEDIUM	MEDIUM	HIGH
	RARE	Conceivable but extremely unlikely	LOW	LOW	LOW	MEDIUM	HIGH

Risk Assessment FAQ's & Information

Q. How many of these should I fill out?

A. That depends on the scope of your work. If you do the same general processes with the same type of material in 3 or 4 lab spaces, you can put everything on one risk assessment. If you have 2 very different projects with different risks and different organisms using separate rooms, you can fill out 2 risk assessments.

Examples:

A lab doing diagnostic assays with various risk group 2 biological materials that spread via the same route would easily be included on the same risk assessment because they have the same risks, same PPE, same precautions, etc.

A lab doing one project using human materials and recombinant DNA that require universal precautions and BSL2 containment/practices and another project that uses RG1 bacteria may consider filling out 2 risk assessments.

Q. Can I include more than one microorganism on the same row under section 3.1?

A. Yes, If you work with multiple strains of RG 2 bacteria or viruses that share the same signs/symptoms and LAI, you can include them on the same line. Don't combine organisms that have different risk groups or differ in their signs/symptoms or LAI.

Q. What type of information are you looking for under 3.2 Biological Activities?

A. This should include information about what you plan on doing with the microorganisms you listed. You should include basic assays, tests, methods, and anything relevant to how you will be working with the material.

Q. How do I know where my lab fits in on the risk matrix?

A. Use the top row of the matrix and select the consequence for the most severe possible outcome in your lab during routine work. This isn't covering unrelated incidents resulting from a personal health incident, acts of nature, etc. In the routine use of your lab what is the most likely worst consequence? Then, based on that selection, choose what the likelihood of that consequence occurring.

Examples:

a. Work with a RG1 bacteria at BSL1. Work involves sharps but no dangerous equipment or significant volume. Bacteria is extremely unlikely to cause disease, requires a large exposure event, and no/low incidence of LAI.

This would likely be a Minor consequence as the likely worst case scenario here would be a spill of bacterial material or sharps injury. Then we need to select a likelihood of one of those events happening. I would mark this as either unlikely or possible. This depends on the expertise of your team, experience, and how often they are using sharps/bacteria.

- b. Work with a RG2 virus that spreads via aerosols/ocular routes. Work involves routine pipetting, some smaller volume centrifugation, and cell work. All work with live virus takes place in the BSC.

This would likely fall under a Moderate consequence as there is a potential of moderate illness if a person is directly exposed. However, because all live virus is worked on in the BSC, the likelihood of a direct exposure event would either be rare or unlikely. This depends, again, on the expertise of your team, experience, and procedures for working with the material (transport to/from BSC, etc).