iGEM 2013 Basic Safety Form

Team name: UNITN-Trento

Deadline: 30th of August 2013

Submission method: email form to the correct email list for your region:

safety_forms_asia@igem.org
safety_forms_europe@igem.org
safety_forms_north_america@igem.org
safety_forms_latin_america@igem.org

Students can complete this safety form, but it must be read and signed (electronic or hard copy) by your team's faculty advisor. Your advisor must verify the information contained in this form and sign it.

The iGEM Safety Committee must be able to easily reach the advisor with questions or other follow-up communication. If you have made changes to your project (new coding regions or organisms) you must re-submit your safety form before wiki freeze (date TBD).

Key points to remember as you complete the safety assessment process:

- For help in completing questions 1 and 2, you may find it useful to consult the Risk Groups section of the Safety Resources List [2013.igem.org/Safety].
- The iGEM Safety Committee will be reviewing your project. To avoid temporary suspensions, answer these questions completely and accurately.
- The Safety Committee needs to be able to communicate with your faculty advisor about any safety concerns. If we cannot reach your advisor in a reasonable amount of time, you may be subject to restrictions at the Jamboree.
- Your safety page, wiki project page and poster should be consistent with each other. If you change your project, submit an updated Basic Safety Page to the iGEM Safety Committee before the wiki freeze. (Your faculty advisor must also read and sign the updated page.)
- We understand that projects may still be changing at a late date. However, large discrepancies between what you submit on the Basic Safety Page and what you present at the Jamborees may result in restrictions at the Jamboree.

Basic Safety Questions for iGEM 2013

a. Please describe the chassis organism(s) you will be using for this project. If you will be using more than one chassis organism, provide information on each of them:

	Species	Strain no/name	Risk Group	Risk group source link	Disease risk to humans? If so, which disease?
Ex	*E. coli* (K 12)	NEB 10 Beta	1	www.absa.org/riskgroups/bacteriasearch.php?genus=&species=coli	Yes. May cause irritation to skin, eyes, and respiratory tract, may affect kidneys.
1	E.coli (K12)	NEB 10 Beta	1	http://www.absa.org/riskgroups/	Yes. May cause irritation to skin.
2	E.coli (K12)	NEB 5 alpha	1	http://www.absa.org/riskgroups/	Yes. May cause irritation to skin.
3	E.coli (K12)	BL21	1	http://www.absa.org/riskgroups/	Yes. May cause irritation to skin.
4	E.coli (K12)	TOP10	1	http://www.absa.org/riskgroups/	Yes. May cause irritation to skin.
5	E.coli (K12)	TB1	1	http://www.absa.org/riskgroups/	Yes. May cause irritation to skin.
6	E.coli (K12)	JM109	1	http://www.absa.org/riskgroups/	Yes. May cause irritation to skin.
7	Bacillus Subtilis	168	1	http://www.epa.gov/oppt/biotech/pubs/fra/	B. subtilis is not a human pathogen.
8					

*For additional organisms, please include a spreadsheet in your submission.

2. Highest Risk Group Listed:

1 ◉ Greater than 1 ○

If you answered 1+, please also complete the iGEM Biosafety form part 2 for any organisms in this category.

3. List and describe *all* new or modified coding regions you will be using in your project. (If you use parts from the 2013 iGEM Distribution without modifying them, you do not need to list those parts.)

	Part number.	Where did you get the physical DNA for this part (which lab, synthesis company, etc)	What species does this part originally come from?	What is the Risk Group of the species?	What is the function of this part, in its parent species?
Ex	BBa_C0040	Synthesized, Blue Heron	Acinetobacter baumannii	2	Confers tetracycline resistance

1	BBA_J45119 (resubmitted in	Registry 2012	Petunia x hybrida	1	catalyzes production of methyl salicylate from salicylic acid
2	BBa_J45319 (resubmitted in	Registry 2012	Pseudomonas aeruginosa	2 (exempt to form 2)	catalyzes production of salicylate from chorismate
3	BBa_K1065000	Synthesized, Genescript	Pseudomonas Siringae pv. phaseolicola	1	catalyzes Ethylene biosynthesis from 2-oxoglutarate
4	BBa_K1065104	Extracted by PCR from E. coli MG1655 genome	E.coli MG1655	1	catalyzes S-adenosyl-L-methionine synthesis
5					
6					
7					
8					

*For additional coding regions, please include a spreadsheet in your submission.

4. Do the biological materials used in your lab work pose any of the following risks? Please describe.

a. Risks to the safety and health of team members or others working in the lab?

Some of our parts produce ethylene or methyl salicylate. We carefully reviewed the MSDS for these compounds. The concentration our system produces is below the risk level for workers. Nevertheless, we always handled all cultures producing these molecules under a chemical hood.

b. Risks to the safety and health of the general public, if released by design or by accident?

If released accidentally our parts should not pose any risk to the public. The amount of ethylene or methyl salycilate produced in the open air would be significantly lower than any level reported in the literature to be dangerous to people exposed to these molecules.

c. Risks to the environment, if released by design or by accident?

There would be no risk for the environment. Both ethylene and Methyl salicylate are naturally used by plants.

d. Risks to security through malicious misuse by individuals, groups, or countries?

Ethylene can be explosive if stored at high concentration (27,000 ppm). However, our parts produce small quantities of ethylene (i.e. 3 mL of liquid culture expressing our ethylene device in a 15 mL container produce about 200 ppm), so these parts should not pose a threat if misused.

5. If your project moved from a small-scale lab study to become widely used as a commercial/industrial product, what new risks might arise? (Consider the different categories of risks that are listed in parts a-d of the previous question.) Also, what risks might arise if the knowledge you generate or the methods you develop became widely available? (Note: This is meant to be a somewhat open-ended discussion question.)

The large scale production of ethylene in a closed container could pose some risks, because high concentrations of ethylene are explosive. The parts in question here are BBa_K1065000 and its derivatives. The described vending machine would not contain sufficient ethylene to be of risk.

6. Does your project include any design features to address safety risks? (For example: kill switches, auxotrophic chassis, etc.) Note that including such features is not mandatory to participate in iGEM, but many groups choose to include them.

No, however, most of our parts are controlled by inducible promoters. We also intentionally avoided a more common ethylene producing pathways that releases cyanide as a byproduct. Further, the exploited Bacillus subtilis strain is auxotrophic (i.e requires threonine).

7. What safety training have you received (or plan to receive in the future)? Provide a brief description, and a link to your institution's safety training requirements, if available.

The team attended a Synbio Lab course during the Spring. Additionally, at the beginning of the summer we were trained by the staff responsible of the teaching labs where we are hosted.

8. Under what biosafety provisions will / do you work?

a. Please provide a link to your institution biosafety guidelines.

http://www.unitn.it/ateneo/1691/argomenti-sicurezza (in italian)

b. Does your institution have an Institutional Biosafety Committee, or an equivalent group? If yes, have you discussed your project with them? Describe any concerns they raised with your project, and any changes you made to your project plan based on their review.

The University of Trento does not have a specific Biosafety office; however, we coordinated with the UNITN office for the Prevention and Protection of workers, which worked with past iGEM teams. This office approved our work plan and safety protocols.

c. Does your country have national biosafety regulations or guidelines? If so, please provide a link to these regulations or guidelines if possible.

http://www.ispesl.it, Italian institution for work prevention
http://www.ebsaweb.eu/Home.html, European Biosafety Association
http://www.who.int/csr/resources/publications/biosafety/ManualBiosafety.pdf

d. According to the WHO Biosafety Manual, what is the BioSafety Level rating of your lab? (Check the summary table on page 3, and the fuller description that starts on page 9.) If your lab does not fit neatly into category 1, 2, 3, or 4, please describe its safety features [see 2013.igem.org/Safety for help].

Biosafety level 1

e. What is the Risk Group of your chassis organism(s), as you stated in question 1? If it does not match the BSL rating of your laboratory, please explain what additional safety measures you are taking.

We worked only with Risk group 1

Faculty Advisor Name:

Sherif S. Mansy

Faculty Advisor Signature: