iGEM 2013 Basic Safety Form

Team name: ZJU-China

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 resubmit 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*(K 12)	10 Beta	1	http://www.absa.org/riskgroups/bacteriasearch.php?genus=Escherichia	Yes. May cause irritation to skin, eyes, and respiratory tract, may affect kidneys.
2	*E.coli*(B)	BL 21	1	http://oba.od.nih.gov/oba/rac/Guidelines/NIH_Guidelines.htm#_Toc351276292	Yes. May cause irritation to skin, eyes, and respiratory tract, may affect kidneys.
3	*E. coli*(K12)	JW1870	1	http://www.nature.com/msb/journal/v2/n1/synopsis/msb4100050.html http://www.absa.org/riskgroups/bacteriasearch.php?genus=Escherichia	Yes. May cause irritation to skin, eyes, and respiratory tract, may affect kidneys
4					
5					
6					
7					
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_K1054000	Cloned, cDNA, Takara	phiX-174 bacteriophage	2	Lyse *E.coli*
2	BBa_K1054005	Cloned, pSB1A3, part distribution	*E.coli*	1	Ampicillin resistance
3	BBa_K1054006	Cloned, pSB1A3, part distribution	*E.coli*	1	Ampicillin resistance
4	BBa_K1054010-BBa_K1054020	Synthesized, Takara	*E.coli*	1	riboswitch
5	BBa_K1054030	Cloned, pseudomonoas sp.	*pseudomonoas* sp.	2	Degrade atrazine
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?

No. We have not used any materials that raise risk to researchers' safety or health. We only worked with level 1 safety organisms and they are *E.coli* K12 strain DH10β, JW 1870 and *E.coli* B strain BL21, respectively. Considering the toxicity of EB, our lab choose gel red as nucleic acid dye, which raises little safety concerns.

Every researcher in our team has to accept safety training and pass the on-line test before obtaining the access to the laboratory and conducting experiments. During any experiments, necessary individual protections such as gloves and white robes were strictly required. Also, the public safety of the lab is guaranteed by the strict registering protocols on the operation of any apparatus. In order to make sure all the requirements of safety were carried out well by the researchers and to get prepared for any emergency, our lab set up 24/7 camera system in

the rooms.

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

No.Our project ideas do not raise any public safety issues. In our laboratory work, we picked DH10 beta, BL21 and JW1870 to transform in our research, which are all non-pathogenic *E.coli* strains and do not pose problems to the public health. Bacteria ghost is dead and cannot do any harm to the public, and we have been working on a suicide mechanism for those anti-herbicide E. Coli, also adding a calcium phosphate shell to reduce its risk of danger. While there is a slight chance that these antibiotic resistant strains may pose a threat to public safety if released from the lab environment, all safety protocols were carefully followed and cells were disposed according to institutional requirements. Furthermore, access to our lab is strictly regulated, and it is extremely difficult for unauthorized individuals to access areas where *E.coli* is being stored or grown.

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

No. We have confirmed that our product would not produce any toxin and we equipped the bacteria with a kill switch to prevent it from posing any large-scale threat to the environment. Moreover, We make sure no media containing engineered cells go into the sewer before sterilization, and all utensil contacted with the engineered bacteria will be sterilized. The acid and basic chemicals are neutralized and pour into the sewer. Toxic and hazardous chemicals are collected and treated properly according to the safety rules of our university.

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

Our project hardly poses any risks to security through malicious misuse by others. Our lab has a thorough security system to ensure people not relating to our project cannot enter the lab. Also, there is a slight chance that these anti-herbicide *E.coli* transform into a bio-weapon since they can only degrade atrazine. As opposed to bacteria ghost, these bacteria are dead and hardly see any help for inappropriate uses.

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.)

There might be possible risks to the public and environment. Once the atrazine killer is released to the soil, it might attach to the root of plants and access to the public. Also, its effect to the environmental balance remains unknown. To minimize these risks, we have developed a kill switch and a calcium phosphate shell.

The risks of misuse of our knowledge when it is widely available are negligible since our work has no connection with weapons and epidemic disease.

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.

Yes. We uses *E.coli* JW1870, which is motility-defected, to construct our atrazine killer system and it won't be spreading when lacks atrazine. Moreover, we have designed a suicide mechanism to prevent it from posing huge threat to the environment. We also equipped the cells with calcium phosphate shell, which is a barrier between the GMO and environment.

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.

accept the training about lab safety, standard experiment procedures and lab waste treatment and pass the on-line test.
http://www.zjubiolab.zju.edu.cn/page/question.php
http://www.zjubiolab.zju.edu.cn/page/catalog.php?catalog_fid=7&question
only the Chinese version available and some may require login

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

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

http://www.zjubiolab.zju.edu.cn/page/news.php?action=show&id=3743 (only Chinese version available)

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.

No.There is no local bio-safety group, committee or review board in our school or institution, yet we do strictly obey the policy and regulation regarding bio-safety in our country, which is listed below.

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.biosafety.gov.cn/gjzcfg/flfg/200401/t20040115_88044.htm (only Chinese version available)

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].

Level 2

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.

The biosafety Level rating of our lab matches the Risk Group of our chassis organisms.

Faculty Advisor Name:

Ming Chen

Faculty Advisor Signature: