iGEM 2013 Basic Safety Form

Team name: UNIK_COPENHAGEN / TEAM MAGNETO

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	*Magnetospirillum gryphiswaldense*	DSM-6361	1	www.dsmz.de/catalogues/details/culture/DSM-6361.html	N o
2	*Magnetospirillum magnetotacticum*	DSM-3856	1	www.dsmz.de/catalogues/details/culture/DSM-3856.html?tx_dsmzresources_pi5%5BreturnPid%5D=304	No
3	*E. coli*	E. cloni 10G &10GF	1	http://lucigen.com/store/E.-cloni-10G-and-10GF-Chemically-Competent-Cells	No
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	MamC	Molecular cloning, DSMZ	*Magnetospirillum gryphiswaldense*	1	Putative functions in magnetosome biomineralization and magnetotaxis
2	MamC	Molecular cloning,DSMZ	*Magnetospirillum magnetotacticum*	1	Putative functions in magnetosome biomineralization and magnetotaxis
3	eGFP	Dep. Plant & Enviromental Sciences , University of Copenhagen	*Aequorea victoria*	1	Confers green fluorescence, range blue-UV light
4	eFBFP	Synthesized, Eurofins (mwg/operon)	*Pseudomonas putida*	1	Confers green fluorescence, range blue-UV light
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?

The microorganisms have been classified as BSL-1, therefore it is unlikely to cause any disease to humans. Moreover, the biobricks used come from microorganisms regarded as safe and no hazardous or toxics properties associated with them are known. Therefore, we do not expect that our project will represent any safety issue for none of the team members or personnel in the lab especially since all access in the lab is limited to people that have received an appropriate Biosafety training.

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

As in the case of the previous question, we believe that the biological material used, is not a risk for the safety and health of the general public in case of release. Morover, the organisms used did not suffer any mayor change that can result in potential harmful agents for the general public.

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

The two antibiotic resistance genes used are only for the initial stages of our project. Our final selection marker will correspond to the eGFP and eFBFP proteins, that will not represent any environmental risk in case of horizontal gene transfer because they are generally regarded as harmless. Also, these genes will be probably lost since they do not encode for beneficial compounds and it will consist a waste of energy for the microorganisms to conserve them in the absecence of selective pressure.

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

Our microorganisms do not represent any security risk. They would have to be further developed in order to represent a biosafety risk. Due to their strict cultivation conditions and natural habitats we think it is unlikely that somebody will misuse our strains with malicious intentions because these microorganisms will not easily survive outside the laboratory. Moreover the strains will also have to be modified to contain some harmful compounds since they lack any dangerous components.

viewer-2.png

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.)

If the use of magnetosome will be eventually commercialized, we believe that it will not represent any environmental risk since they are biodegradable. Moreover if the magnetosomes are used for targeted drug delivery, they will be optimized during a series of clinical trials in order to be completely safe for the patients, so we assume that it will not represent any health risk. However it is highly unlikely that the magnetosomes can became a security risk, if they will be manipulated to deliver toxins instead of drugs. For more information you can consult the Biosafety section or our Wikipage

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.

Our project does not include such features since our microorganism could not survive and proliferate in an uncontrolled environment. The E. coli strain is highly degenerated and the two Magnetospirillum strains are microaerophilic and therefore require lower oxygen levels than the ones present in the atmosphere in order to survive.

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.

Our team followed a lab tour concerning the biosafety in the lab provided by an experienced lab technician. During this tour our group was informed with the basic rules of the lab as well as with the biosafety regulation at our university. Moreover, we also took part of a workshop concerning Biosafety at the Technical University of Denmark held by Professor Chris Workman. At the workshop we developed our knowledge in lab safety procedures and we became familiarized with the database of chemicals" Kemibrug" that among other information, contains a safety data sheet (SDS) of the chemicals used normally in the lab

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

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

http://www.plbio.life.ku.dk/om_instituttet/Intranet/Sikkerhed_arbejdsmiljoe/01_arbejde_i_GMO_level1_lab.aspx

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.

Yes, our institution has a Biosafety Committee. We have talked to them about our project. The only condition the implemented was, that we are not allowed to be in the lab without supervisors.

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

www.arbejdstilsynet.dk/da/regler/bekendtgorelser/g/sam-genteknologi-og-arbejdsmiljo-910.aspx

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].

The raiting of our lab corresponds to category 1, but it also posses certain features of higher BSL laboratories. It posses a localized ventilation system and an autoclave machine on site.

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.

The BSL of our organims correponds to BSL1 and our risk analysis concluded that the BSL of the laboratory can be level 1, since no hanzards arising for the biobricks and/or organisms are expected. Therefore, we did not take any addional safety measures.

Faculty Advisor Name:

Björn Hamberger

Faculty Advisor Signature: