

iGEM CSMU X NCHU 's Answers

I. Public engagement

What stakeholders do you interact with?

We visited pharmaceutical companies, food manufacturers, professors of biochemistry, toxicology, biotechnology

What channels or ways did you involve your stakeholders?

-Seeking ongoing input and feedback from stakeholders

Stakeholder: Pharmaceutical, explained to them our project, obtained feedback.

-Seeking collaboration of diverse stakeholders through co-creation methods

Collaboration with other school's iGEM team to co-create our project

-Leveraging social media to promote reflections and get different voices involved

Facebook page, youtube page, to engaging with people with different methods like posts, videos, and more.

Stakeholders: High school students

- Improving participants' skills

Workshop teaching high school students presentation skills, interview skills

- Empowering participants

Encouraging high school students to explore and follow their desired career path

II. Science Education

1. Which stakeholders are part of your educational activities in Human Practice?

How did you impact the stakeholders?

(1) Students ranging from elementary school age to high school: by holding workshops and classes, the team's aim is to increase their learning passion in the field of biology and medicine.

(2) The food industry: we envision a food industry free from aflatoxin contamination, thus by consulting with different part of the industry chain, we keep on adjusting our project to find the most realistic and attainable solution to solving the problem.

(3) Drug companies: we introduced to them ideas of improving existing situations on the problem of aflatoxin, creating a bridge of communication between students and companies. Also supporting each other, them giving us advice while we help them increase public exposure.

(4) Mass society: through a series of public engagement such as Street interviews and street vending with educational purpose, the team tries to connect with people from all walks of life, in order to raise the awareness of issues like aflatoxin contamination in food.

2. What dimensions of impact (social, environmental, legal, economic...) do your activities include?

(1) Social impact: Raising the awareness among customers that food safety is an important issue which everyone should take seriously.

(2) Environmental impact: Assume our test strip is ready undergo mass production, the first problem that strikes our team is the waste. The used test strips could accumulate and later on become

a threat to our environment. We envision our device to be 3D-printed with eco-friendly or biodegradable materials.

(3) Legal impact: We consulted two legislators in our country about the food safety policy and also whether our device would be able to help the current food safety inspections.

3. How did you tailor your information and educational resources to the iGEM community?

(1) Our team came up with different lesson plans ranging from elementary to senior high school students, with those teaching materials other teams can easily start up their own education human practice by taking reference from it.

(2) All the documents form the human practice are well organized and uploaded on the wiki page for viewers (To see more please visit "open access").

4. How did you tailor your information and educational resources not limited to the iGEM community?

(1) Our team established a club in college to promote the concept of iGEM also science related issues to the students. We offer our the iGEM experience to non-iGEMers or hopefully iGEMers-to-be, expecting the students to learn from it and use it not only in science competitions but also to approach the society.

5. How do you reflect on the impact of your activities?

(1) The impact is still growing. We believe that by keep promoting our value toward food safety and the benefits of engaging in a research program, more will aware the issue we brought up and hopefully solve the problem with our team.

III. Open Access

1. How is open access integrated in your project?

Since our main goal is to tackle the world wide crisis of aflatoxin, we believe that by giving everyone our access to the data and results, there will be a bigger chance to share our experience or even cooperate with the ones who are also working in this field. All the results from our team and data is shown on the wiki page. Furthermore, we created a facebook page to make communication easier with other iGEM teams or people that are interested in the topic to further discuss with us.

2. How transparent is the process and outcome of your project?

The project can be simply divided into four parts for lateral discussion: "wet lab", "dry lab", "human practice" and "device & app".

(1) Wet lab: All the lab works, photos, protocols, notes and records from discussion with tutors are well-documented and sorted with date in order to upload to our team wiki, as for some of the sound record during meeting were typed in to documents which is more browser-friendly.

(2) Dry lab: the works in dry lab including protein modeling and docking. The software we use and how we finish this part in our

project is recorded step by step. We believe via browsing our wiki pages, the visitors can grasp the concept and methods we used.

- (3) Human Practice: Human practice could be the most complicated part since this subject ranges from public engagement, education to meet-ups and conferences the team attended. All the activities and actions were recorded by the photographers in the team. Thus by visiting our youtube channel, those who are interested in our topic can know more. In addition, by creating this RIA tool and becoming the first subject to be evaluated, the viewers can learn what our team accomplished in the field of human practice, also the aspects they could put into consideration in the future.

Device and App: this part of our project includes the app we design to detect and report cases of aflatoxin contamination and our test strip.

IV. Governance

1. What governance instruments are implemented in your iGEM team to foster shared responsible innovation responsibility?

- responding to emerging views- We realize the need of the society towards tackling the aflatoxin problem and decided to respond to this need

2. How has your team fostered inclusion on the team level

We have team meetings every week to track our team progress as well as hear any opinions any team members have. We respect what each other think and try to accommodate to everyone's views.

3. How has your team invested in making research or innovations more inclusive to societal needs and concerns

We visited pharmaceuticals and factories that are concerned with the aflatoxin problem and hear from their opinions to try to make our project as inclusive of societal needs like lower cost.

4. How do you ensure your practices can adapt to potential concerns of the innovation to include future unforeseen results and societal needs ?

We try to build tools that will enable community-fostering, such as our app food safety discussion platform, which we hope can help inclusiveness of voices, needs and trends.

V. Ethics

What are some possible ethical considerations for your human practices?

Environmental- We used electronic devices at booths to help us introduce our project to the public, also allowing them to fill an online questionnaire that tested their awareness towards aflatoxin. Reducing the use of paper to be more environmentally friendly.

Animal health impacts- Our project is working on an enzyme that will be able to degrade aflatoxin, which can be applied to animal feed, degrading the aflatoxin in their food to boost animal health.

Data management- If our online app and platform expands, we would need to secure data management with protection softwares, apply guidelines and principles on to managing the data. Cooperate with government operations to ensure data accuracy and synchronisation