

## Bio<sup>3</sup>Dimensions – Business Case

### Introduction

Educating people is not only about giving lectures, it is also about offering people the opportunity to feel and think about the subject. We wanted to give this opportunity to students of the TU Delft in the form of a business case. Since the participants had different expertise, we started with a general introduction to iGEM, synthetic biology and our project. After that, four groups of three persons were working on the business case. Each group had a tutor from our iGEM team.

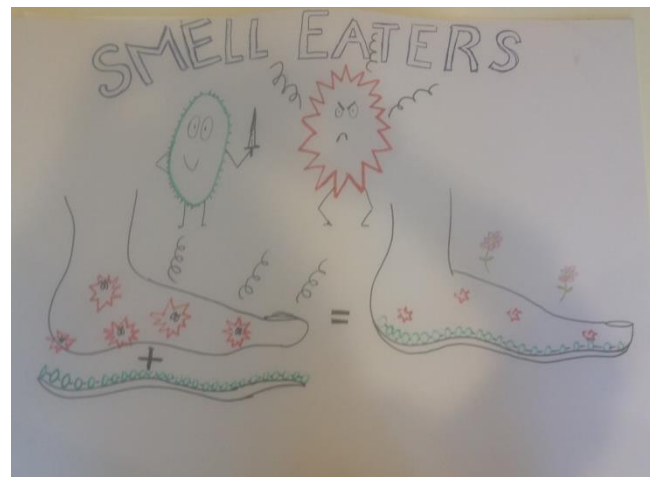


Based on the information we gave about the project, the different groups could use one of our applications or come up with one on their own. They also had to choose their market of interest, think about the drawbacks of their technology and came up with a market plan. After the groups worked individually on the cases, every group presented their idea with a poster pitch. We closed the meeting with a free barbeque to thank the participants, and continue discussing with them in a more informal setting.

### Ideas of the groups

#### Smell Eaters

The first group came up with a shoe sole on which a biofilm with the smell eaters (good bacteria) was printed and attached. The group knew that researchers described a way to help people with sweaty and smelly armpits, by using 'good' bacteria. These bacteria could help people having trouble with sweaty armpits by producing substances that prevents the bad bacteria in producing 'smelly' compounds. Based on this idea, the group wanted to apply this idea on the feet. Since the shape of each foot differs from person to person, the printer is nice because it can be applied to every type of foot. The poster in which this project is presented, is shown right.

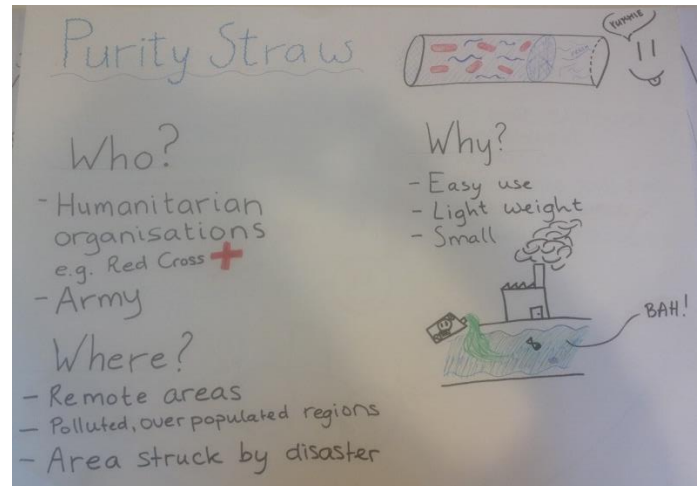


According to this group, the technology could be useful for everyone with smelly feet. Since you want to make it suitable for every type of feet, maybe it can be coupled to stores specialized in making individual shoe soles. They did not implement a system that could protect the user for 'escaping' organisms.

## Purity straw

The second group provided a solution for the contamination of drinking water. The straw has a membrane inside, which can clean contaminated water. Because the straw it is suitable to use it in every situation and the printer gives the opportunity to print all kind of membranes, which makes it useful for every type of contamination.

It was really wonderful to see that they actually provided a kind of market strategy on their poster (Right). According to them, the product could be useful for humanitarian organizations in helping developing countries to get clean water and also for the army to have clean water everywhere. Especially remote areas, over populated regions and areas stuck by disaster would profit from this wonderful technology. Finally, why did they think the technology was useful and beneficial? Well, it is easy to use, the material is light and therefore easy to take with you. Finally, it could be small.

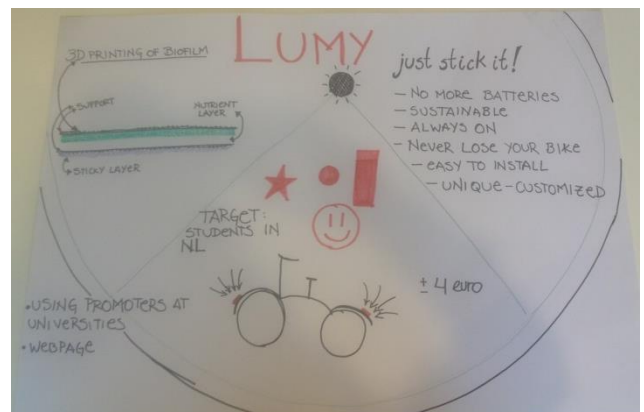


The discussion after the presentation contained some nice questions:

- “What about the fact that people could swallow the bacteria during drinking? The team answered with: “People should just adapt to this situation, since the bacteria in the straw are less harmful than the bacteria present in water”. Actually, by using this device, the bacteria should have a GRAS status;
- According to a student of industrial design, such a technology already exists. So, this team did a really nice job here!

## Lumy

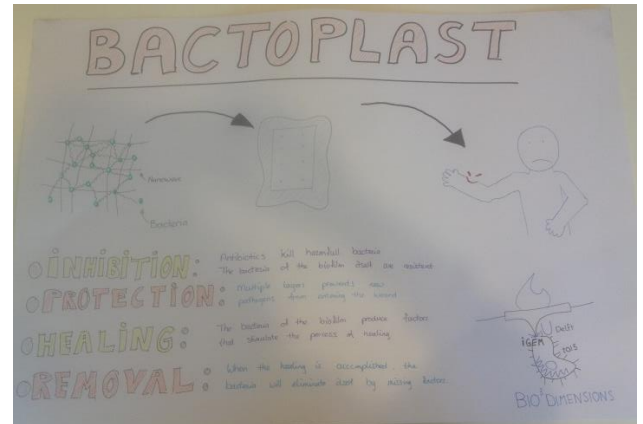
Another team came up with a totally different application of our construct; ‘the Lumy’. Lumy provides the sustainable version of lights for the bicycle. The Lumy can be ordered at a special website in every shape you like. The product you will receive at home consists of a sticky layer, a layer of nutrients (medium), and the biofilm which has the property to emit light. So, the only thing you need at home is medium for the bacteria! Since batteries are not necessary anymore, the product could be highly sustainable.



The Lumy is especially useful in a country like the Netherlands (students for sure), since everyone uses a bike a lot. Moreover, since the equipment is closed, the bacteria cannot escape.

## Bactoplast

The final concept presented was really identical with the idea Groningen's iGEM team had two years ago. The printer will be used to print the biofilm required at that moment for healing processes. The so-called bactoplast is placed on the wound and will increase the wound healing process. After the healing process, the signal molecules of the wound will disappear. The signal for the bacteria to activate their kill switch. Therefore, there is no danger of bacteria that will escape.



Since it is difficult to keep the bactoplast fresh, this group aimed hospitals and doctors. However, it would be even nicer if people could use the device at home. In that case, the bactoplast can be used in every kind of wound.

## Closure

After the hard work of the teams, it was time to relax. We organized a free barbecue with drinks and, for the Netherlands very occasional, sun. We all enjoyed the evening and got a lot of nice feedback from the participants. One of the girls said that she, at first, was not really convinced of what synthetic biology could mean for the future but after the business case, she saw all the promises of this field.

