September 2019 | Volume 3

Newsletter

iGEM Team Vienna 2019

We are happy to have you hold our third newsletter in your hands! Learn more about the progress of our 2019 iGEM project „**A novel approach to Buruli Ulcer diagnostics**“ and further plans.

Editorial

Summer is coming to an end, and so is our project. With big steps we are approaching major deadlines and the big closing event in Boston, MA. But we don't get tired and still have a lot to do. In this newsletter, we explain that Golden Gate is not only a bridge in San Francisco, we talk about the progress we have made in the laboratory, why we were in Munich and what we have planned for the European Researchers' Night.

Gofundme

We are approaching the final stage of our project. Even though we are lucky to have the support from generous companies listed below, we are still trying to get all the support we can. For this reason, we have prepared a crowdfunding profile on **GOFUNDME**, where we invite everyone to donate an amount of money they feel comfortable with in support of our project. As a thank you, we have prepared gift packages including products such as handmade crocheted *Escherichia coli* mascots, socks or pens.

We are grateful for each and every donation!

https://www.gofundme.com/f/a-novel-approach-in-buruli-ulcer-diagnostics

Mycolactone

The iGEM Team BOKU-Vienna wants to thank **Dr. Kingsley Asiedu**, his **lab** and the **World Health Organisation (WHO)** for the provision of mycolactone. Thanks to their generous donation, we are now able to test our method.

Thank you so much!

Lab progress

What happened in August? Initially our laboratory team tried to assemble the individual Golden Gate constructs. In order to check if the constructs were correctly inserted into the plasmids, we have done some sequencing. After the evaluation of the samples and subsequent improvements, the individual constructs could be brought together in a backbone. This was mostly done with the same methods as in July. Many of these steps were repeated until the result met our requirements. In addition to the conventional cloning methods (restriction, transformation, plating, colony picking, ...), a colony PCR and several PCR's were performed. Due to numerous smaller achievements and the prospect of getting mycolactone, the first results of our aptamer switch can soon be presented.

iGEM Alpine Meetup

On the last weekend of August iGEM teams from the alpine region met in Munich. Besides old acquaintances like Team Erlangen, we also got to know new teams from Graz and Munich. The program offered us the opportunity to attend interesting lectures by renowned researchers as well as workshops. We could also exchange ideas with representatives of the companies Eppendorf, Abcam and Twist Bioscience. Each team had the opportunity to present their project in a short presentation and a poster session and received valuable feedback. During the pub crawl, a visit to the beer garden and a city tour we got to know each other, exchanged experiences and also learned about the history of Munich.

A big thank you to the iGEM Team Munich for the successful meetup!

Figure 1: Group picture (provided by Annika Elimelech)

Update #SixPicsChallenge

To realize our comic book about synthetic biology **(#SixPicsChallenge**), we contacted teams all over the world to ask them if they would like to collaborate with us on this idea.
So far, already 12 teams from the USA, France, Germany, Canada, Greece, Belgium, India and Estonia have registered. Easy to follow, these teams will explain their unique science project on six pages.
Their projects range from developing new and faster diagnosis methods to creating bacteria which can generate electricity from cigarette butts.
We are excited to showcase these projects soon to highlight the power of synthetic biology for solving current problems.
Finally, with our booklet, we hope to promote the positive side of this research area in society and increase acceptance.

Pub Quiz

Save the date! On **September 30, 2019**, we have organized an iGEM Pubquiz at Charlie P's!
Show off your Synthetic Biology and Life Science knowledge (or gain some) in a relaxed atmosphere! Compete as a team to win the first prize and eternal glory!
Be there: **Charlie P's**
(Währinger Straße 3, 1090 Vienna) on **September 30, 2019**.
The quiz starts at **6 p.m.**

See you there!

European Researchers' Night

For the **European Researchers' Night 2019** we have organized an exciting stand with hands-on experiments to make the basics of synthetic biology more tangible in a playful manner. Visitors to our stand can get active in a life DNA extraction experiment, and they can try themselves at a "diagnosis" of a swap sample via a color-indicator reaction – Of course, safety is ensured!

We are looking forward to your visit!

Golden Gate Cloning

To make the most efficient use of our restricted laboratory time, we must take a step away from classic, lengthy cloning, towards a faster and more efficient method: **Golden Gate cloning.**
Golden Gate allows to cut multiple DNA fragments in just one step and put them together in the right order. In that way, whole expression cassettes can be built in just one reaction.
In our protocols, we make use of the ability of type IIS restriction enzymes to cut outside of their recognition sequence and generate non-palindromic overhangs which are complementary to the desired following fragment. The recognition sequence is hereby cut away, which makes it possible to assemble the DNA fragments in the same reaction by means of T4 ligases. Golden Gate cloning has thus made our life much easier!

Modeling - Progress

The months have been flying, but we have made some progress, too. After some initial difficulties and some backs and forths, we decided to take a closer look at **mass-action kinetics** and to set up first reaction equations.

Many literature searches later, we now know the diffusion rate of our autoinducer – **2 AHL** (N-acyl homoserine lactone) – in and out of the cell. We will now calculate the concentration-dependent color change of the cells and the production of the chromoproteins to estimate the time between initial mycolactone binding and visible color-changed outputs.

Upcoming Activities

For the next weeks, the following activities will be in our focus:

- On September 23rd at **Franciscо Josephinum** Wieselburg, we will give high school students an insight into the world of Synthetic Biology and present our project.
- As always: Intense laboratory days are ahead of us!
- Planned meeting with the **iGEM Team Graz** in Vienna by the end of September

We will also keep you updated on our progress on our social media channels and the team wiki!

Yours, the iGEM 2019 Team Vienna