

General Notebook



Figure 1. Team Aboa members Laura, Malin, Juuli, Waltteri and Julia.

February

In January we were still recruiting, so our project started properly only in February in the form of regular meetings.

11.2. Regular team meeting

Present: Tiia, Juuli, Laura, Julia, Jenni, Waltteri

The first meeting with a new team. We discussed brainstorming of the project as well as the visibility in social media.

18.2. Regular team meeting

Present: Jenni, Julia, Juuli, Laura, Waltteri, Tiia

In this team meeting we continued our discussions about social media and web pages. Our project topic remained unclear but we brainstormed ideas from gut bacteria to medical waste. In addition, we still tried to recruit people from the other university in our home town.

25.2. Regular team meeting

Present: Laura, Juuli, Julia, Tiia

The brainstorming continued... We discussed things related to the Baltic Sea, e.g. pharmaceutical waste, microplastics and cosmetics. We decided to contact our local water supply company to get more information about the problems regarding wastewater. We also started to apply for different kinds of grants and stipends.

March

4.3. Regular team meeting + expert meeting

Present: Laura, Juuli, Julia

We had a discussion with the expert from our local water supply company. According to her, the biggest problems in wastewater locally are microplastics and some pharmaceutical compounds. We also got some contacts from the organization responsible for protection of water resources. We carefully decided to continue with microplastics.

18.3. Regular team meeting

Present: Laura, Jenni

We updated some important things and scheduled meetings with a vice principal, an iGEM Ambassador and the team Aalto-Helsinki. In addition, we updated our budget.

25.3. Regular team meeting + meeting with Aalto-Helsinki

Present: Laura, Tiiia, Julia

We introduced ourselves to the team Aalto-Helsinki and vice versa. We discussed our project plans as well as possible collaborations.

26.3. Presentation preparation

Present: Tiiia, Laura, Juuli

We had a brief meeting in which we prepared the presentation for our upcoming meeting with the vice principal of our university.

29.3. Meeting with a vice principal

Present: Laura, Juuli, Tiiia

We had a meeting with the vice principal of our university. The topic of the meeting was to present our project to him and to ask our university to fund our attendance fee for iGEM. We also got hints about possible research groups and companies here in Turku that could possibly help us with our project.

April

1.4. Meeting with our PI

Present: Juuli, Tiiia, Laura, Jenni

We had a meeting with our PI to present possible topics for our project and to brainstorm about them. Our PI told us about different problems regarding the degradation of microplastics. We promised to consider them and to continue with the ideation process.

1.4. Regular team meeting

Present: Juuli, Tiiia, Laura

We had a brief discussion about our thoughts based on the earlier meeting with our PI.

8.4. Meeting with Aalto-Helsinki

Present: Tiiia, Laura, Juuli

We asked the Aalto-Helsinki team about their financial structure and credit system. We needed to get as much information as possible to initiate similar strategies here in Turku. Additionally, we updated each other about other project related things.

15.4. Regular team meeting

Present: Laura, Tiiia, Malin, Juuli, Julia

Only at this point Malin Eriksson, our current student team leader, joined the team. We had a meeting with this new composition and updated Malin about our current ideas for the topic and she also gave her opinions about them. We decided to search for previous iGEM projects to ensure that our possible topic is not used before.

22.4. Regular team meeting

Present: Laura, Tiiia, Malin, Juuli, Jenni

We had a team meeting in which we processed the topic of our project forward. At this point our idea was to develop a biofilter containing *E. coli* and cyanobacteria to degrade different types of microplastics. In addition, we discussed possible sponsors and interviews for the local newspapers.

26.4. Photographing session

Present: Malin, Laura, Tiiia, Juuli, Julia, Waltteri

We took our first promotion photos in the beautiful university of ours.



Figure 2. Our first team picture.

May

6.5. Regular team meeting + meeting with our iGEM Ambassador Shristy

Present: Tiiia, Laura, Julia, Juuli, Malin

We had a meeting with Shristy, an iGEM ambassador. We had a nice conversation about all the things between our project ideas and the upcoming Jamboree. In addition, we had a regular team meeting in which we updated on different things, such as the topic of our project and the team member's introductions in social media.

12.5. Regular team meeting

Present: Malin, Juuli, Julia, Tiia

We continued our brainstorming and considered the possibility to change our topic from microplastics to pharmaceutical waste, especially to diclofenac.

13.5. Meeting with our PI

Present: Malin, Juuli, Tiia, Laura, Julia, Jenni

We had a meeting with our PI in which we presented both of our ideas - degrading microplastic and diclofenac. We decided to continue with diclofenac. In addition, we discussed the lab facilities, reagents, visibility in media, intermediate results etc.

Diklofenaakki

- Käytetään tulehduskipulääkkeenä kipugeeleissä.
- Jätevedenpuhdistamot eivät pysty poistamaan jätevedestä nykyisillä menetelmillä.
- 3 iGEM-joukkueita on hajottanut lakkaseilla (vuonna 2020 yhteistyöprojekti)



Figure 3. One slide from our presentation for our PI. We carefully presented the information we had got from diclofenac. It's in Finnish since both our team members and our PI speak Finnish.

15.-16.5. Opening Weekend Festival

Present: Juuli, Malin

We took part in the iGEM Opening Weekend Festival in which we saw many interesting and important presentations about various things.

17.5. The laccase meeting

Present: Malin, Juuli, Jenni, Tiia, Laura

Team TU Kaiserslautern 2020 invited us to participate in their laccase meeting, in which they shared their knowledge of laccases to everyone that was interested. The teams participating in this meeting were Team UChicago 2021, Team DUT China 2021, Team CPU China 2021 and Team Kaiserslautern 2021. In this meeting we also met part of our partnership team UChicago for the first time!

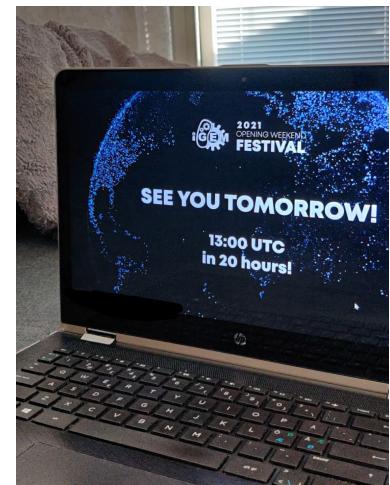


Figure 4. The first day of the Opening Weekend Festival is over.

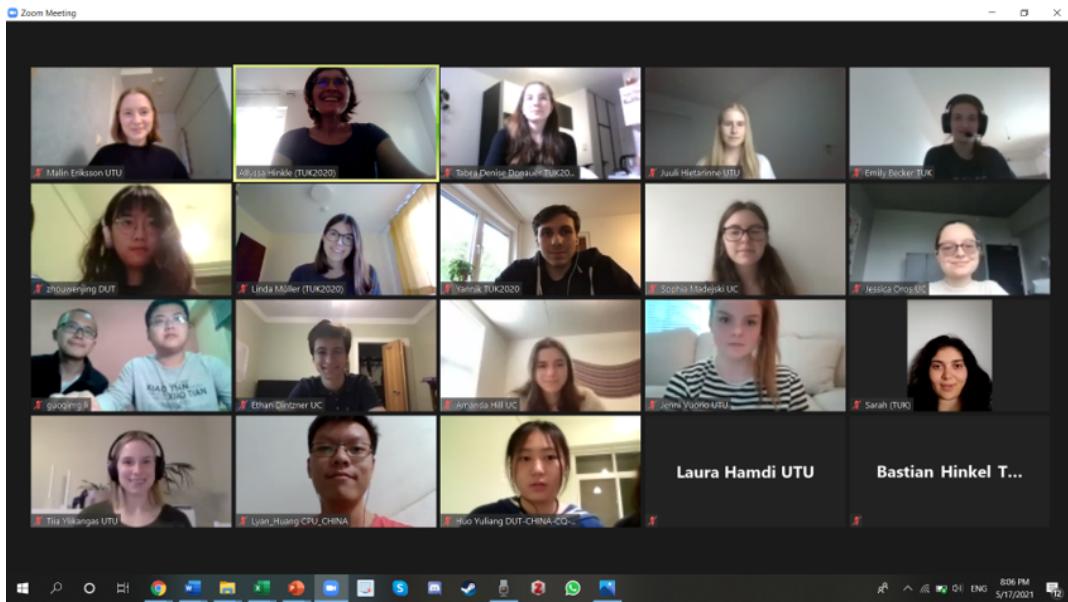


Figure 5. The laccase meeting in which we met the part of our Partnership team UChicago for the first time.

20.5. Regular team meeting

Present: Julia, Tiiia, Malin, Laura, Jenni

We decided to familiarize ourselves with previous iGEM projects regarding diclofenac so that we don't accidentally conduct a project that is too similar to them.

26.5. Regular team meeting

Present: Malin, Tiiia, Laura, Juuli

We discussed further about previous iGEM projects regarding diclofenac. In addition, we prepared a presentation for our first meeting with the team UChicago.

27.5. Meeting with our partnership team UChicago

Present: Tiiia, Juuli, Julia, Malin, Laura, Waltteri

We had the first meeting with our partners from the University of Chicago. We told each other about the project ideas of each team and considered possible aspects for partnership. We tentatively decided to give them measurements about binding free energy and they, in turn, would provide us some modelling data of the diclofenac.

June

1.6. Moving to our laboratory

Present: Malin, Julia, Laura, Waltteri, Tiiia, Jenni

We moved some of our stuff (i.e. reagents, equipment) to our laboratory and got familiarized with the building.

2.6. Regular team meeting

Present: Malin, Laura, Juuli, Waltteri, Tiiia

In this meeting we discussed possible laccases to degrade diclofenac and ended up using at least CotA and CueO. Our grand idea was to choose three laccases of which one had never been used for degrading of diclofenac before. We also decided to work with *E. coli* and cyanobacteria and do measurements in different pH and temperatures. Based on that idea, our novelty factors should be the use of cyanobacteria, the dry lab data that the team UChicago would offer to us and the use of a novel laccase.

6.6. Regular team meeting

Present: Tiia, Malin, Laura, Jenni, Juuli, Julia

We talked about the reagents we need as well as about ordering team clothes. We also decided to take part in the postcard challenge and to announce our project to be the activity on the Baltic Sea Day.



Figure 6. Malin moving the boxes to our laboratory.

9.6. Regular team meeting + meeting with a sponsor

Present: Waltteri, Malin, Laura, Julia

We had a meeting with a potential sponsor and managed to close a deal. In addition, we had a regular team meeting in which we discussed upcoming expert meetings as well as the writing of the impact grant application.

10.6. Regular team meeting

Present: Laura, Tiia, Waltteri, Julia, Malin, Juuli

We were exploring the laboratory we got to use and did some cleaning in there. We also tried to find out which equipment we were allowed to use and familiarized ourselves with safety issues.

13.6. Regular team meeting

Present: Laura, Malin, Tiia

We scheduled some future meetings and decided which medal criteria we will try to achieve.

15.6. Meeting with our PI

Present: Laura, Malin, Tiia, Julia, Juuli, Waltteri, Jenni

We had a meeting with our PI in which we discussed kinetic measurements of diclofenac and especially an ABTS assay.



Figure 7. Our presentation about our preliminary research plan to our PI.

16.6. Regular team meeting

Present: Malin, Laura, Julia, Waltteri, Juuli

We orientated ourselves with concepts in Human Practices and had a brief conversation about the inclusivity of our wiki. However, the biggest achievement of this meeting regarding our project was the selection of laccase enzymes we will work on - we chose CotA from

Bacillus subtilis, CueO from *Escherichia coli* and Yak from *Yersinia enterocolitica*. We also discussed the choosing of plasmids and the ordering of DNA.

17.6. Meeting with our partnership team UChicago

Present: Malin, Laura, Waltteri, Julia

20.6. Regular team meeting

Present: Juuli, Julia, Malin, Laura, Waltteri, Jenni

We had a regular meeting in which we simply updated each other about important things and meetings. In addition, we decided to drop the creation of secretion signals in our project due to a lack of time.

21.6. Expert meeting

Present: Julia, Malin, Waltteri

We had a meeting with our local wastewater treatment plant (WWTP) experts. We got a lot of valuable information regarding diclofenac - for example that annually 90 kg of diclofenac ends up in the Baltic Sea solely from here, Turku, and that the current removal efficiency of diclofenac is only 27% in our local WWTP. We also got to know the pH and temperature of wastewater and a possible phase in the purification process where to apply our solution.



Figure 8. Our presentation to our local WWTP.

22.6. Regular team meeting

Present: Malin, Laura

We filled the Nordic iGEM Conference application and announced our project to be a Baltic Sea Day activity.

23.6. Meeting with our partnership team UChicago

Present: Julia, Juuli, Malin, Laura

23.6. Regular team meeting

Present: Malin, Laura, Julia, Waltteri, Milja, Juuli, Tiiia

We got a new team member, Milja, to take care of our web page and wiki. We filled a preliminary safety form and ordered our DNA. In addition, we did other important things, such as planning the promotion video, writing wiki texts and planning social media posts.

29.6. Regular team meeting

Present: Julia, Waltteri, Laura, Tiiia, Malin

We updated our budget and searched for the products we needed to buy for our project. In addition, we also read some literature about our topic and finalized our Impact Grant application.

30.6. Regular team meeting

Present: Laura, Juuli, Julia, Malin

We had a regular team meeting in which we updated each other about important things.

July

1.7. Meeting with our partnership team UChicago

Present: Malin, Laura

2.7. Meeting with a sponsor

Present: Tiia, Malin, Julia

We had a meeting with one of our sponsors, PerkinElmer. We presented our project and discussed analyzing our wastewater samples with their equipment.



Figure 9. Our presentation to PerkinElmer.

5.7. Wet lab

Present: Malin, Julia, Waltteri

We made LBA plates with kanamycin.

6.7. Wet lab

Present: Malin, Julia, Waltteri

We transformed *E. coli* DH5α cells with empty pET36b vectors and prepared 1xBG11 media for autoclaving.

7.7. Meeting with our partnership team UChicago

Present: Laura, Malin, Julia, Tiia, Waltteri

7.7. Regular team meeting

Present: Malin, Waltteri, Julia, Laura, Tiia

We had a regular team meeting in which we, among other things, decided the date of filming our promotion video.

7.7. Wet lab

Present: Julia, Malin

We made *E. coli* cultures for plasmid isolation.



Figure 10. Julia, Laura, Malin and Waltteri visiting our local WWTP.

8.7. Meeting with Aalto-Helsinki

Present: Malin, Laura, Julia, Waltteri

We had a meeting with the Aalto-Helsinki team. Mostly we just updated each other of the projects but also planned a little bit of our visit to Helsinki.

8.7. Wet lab

Present: Julia, Malin

We isolated pET36b plasmids.

9.7. Regular team meeting

Present: Malin, Laura, Juuli, Jenni, Julia

We had a regular team meeting in which we updated each other about important things and planned our visit to Helsinki, to the place of the Aalto-Helsinki team.

9.7. Wet lab

Present: Julia, Malin

We filtered wastewater samples which we got from our local WWTP Turun seudun puhdistamo.

12.7. Wet lab

Present: Jenni, Julia, Malin, Waltteri

We continued filtering the wastewater samples.

12.7. Filming of our promotion video

Present: Waltteri, Tiia, Laura, Malin, Jenni, Julia

We filmed our promotion video and, at the same time, updated each other about important things.



Figure 11. A screenshot of our promotion video.

13.7. Wet lab

Present: Julia, Laura, Malin

We made LBA plates with and without kanamycin, as well as $MgCl_2$ and $CaCl_2$ solutions.

14.7. Meeting with our partnership team UChicago

Present: Malin, Laura, Julia

15.7. Wet lab

Present: Julia, Malin

We transformed *E. coli* DH5α cells with laccase genes.

19.7. Wet lab

Present: Julia

We made *E. coli* cultures for pUCIDT plasmid isolation.

20.7. Wet lab

Present: Julia

We isolated pUCIDT plasmids and made a glycerol prep.

20.7. Wiki and Human Practices meeting

Present: Juuli, Laura

We planned the layout of our wiki pages and started to write wiki texts properly. In addition, we planned our Human Practices activities.

21.7. Meeting with our partnership

team UChicago

Present: Laura, Julia

26.7. Regular team meeting

Present: Malin, Milja, Julia, Jenni, Tiiia, Laura, Walteri, Juuli

We decided on a strategy to write wiki texts and finish different pages. We also had conversations about our Human Practices activities, Phototroph meetups, student fair and education materials.



Figure 12. Picture of our team meeting via Zoom. And the whole team was present - for the first time in a long time.

27.7. Wet lab

Present: Julia, Malin

We did digestion samples.

28.7. Wet lab

Present: Julia, Malin

We separated and analysed digestion samples.

28.7. Meeting with our partnership team UChicago

Present: Juuli, Malin, Tiiia

28.7. Regular team meeting

Present: Laura, Julia, Juuli, Milja, Malin, Tiiia

Today was a testing day so we tested, among other things, to edit our Judging Form, wiki and Part pages. Then we also prepared the presentation for the Nordic iGEM Conference.

29.7. Wet lab

Present: Julia, Malin

We extracted our samples from a gel and performed ligation.

31.7. Nordic iGEM Conference

Present: Juuli, Malin, Laura

We participated in the Nordic iGEM Conference or NIC. On the first day all teams presented their projects. Other teams gave feedback and we also got feedback from actual judges afterwards. In the evening we had a nice online dinner party with Danish teams.

August

1.8. Nordic iGEM Conference

Present: Juuli, Malin, Julia

On the second day of NIC we had a chance to listen to awesome lectures and attend some workshops, in which we discussed with other teams for example about the iGEM experience and safety issues regarding genetically engineered organisms.



Figure 13. Malin presenting our project in the Nordic iGEM Conference.

2.8. Wet lab

Present: Julia, Malin

We cultivated *E. coli* BL21(DE3) cells to make them competent.

3.8. Wet lab

Present: Julia, Laura, Malin

We made competent *E. coli* BL21(DE3) cells, isolated pNiv plasmids and digested Yak plasmids.

4.8. Meeting with our partnership team UChicago

Present: Laura, Malin

4.8. Wet lab

Present: Julia, Malin

We made competent *E. coli* BL21(DE3) cells, transformed them, digested Yak-Nsil plasmids and performed gel electrophoresis for digestion samples.

5.8. Wet lab

Present: Julia, Malin

We run pNiv digested plasmids on gel, extracted DNAs from a gel and ligated pNiv plasmids and laccase DNA.

9.8. Wet lab

Present: Julia, Malin

We made LBA plates with ampicillin as well as liquid cultures of *E. coli* BL21(DE3) cells and *E. coli* DH5 α cells.

9.8. Human Practices meeting

Present: Juuli, Laura

We planned our fair activity as well as school visits. In addition, we familiarized ourselves with the legislation of genetically engineered organisms as well as planned our Integrated Human Practices interviews.

10.8. Wet lab

Present: Julia, Laura, Malin

We made glycerol preps of *E. coli* BL21(DE3)-pET36b cells and isolated and measured the plasmids. In addition, we made competent *E. coli* DH5 α cells and transformed the ligation products from 5.8.

10.8. Meeting with an expert

Present: Malin, Julia, Waltteri

We met with a biochemistry expert and discussed some protocols, temperatures and reagents.

11.8. Wet lab

Present: Julia, Laura, Malin

We analyzed plates from 10.8., made digestion samples of laccase-pET36b plasmids and made liquid cultures of *E. coli* DH5 α cells containing laccase-pNiv plasmids.

12.8. Meeting with our partnership team UChicago

Present: Malin, Laura, Juuli

12.8. Meeting with the team Aalto-Helsinki

Present: Laura, Malin

We planned our visit to Helsinki and updated each other about our projects.

12.8. Wet lab

Present: Julia, Malin

We checked pET36b-CotA/CueO/Yak plasmids, isolated the plasmids from liquid cultures (made on 11.8.) and digested pDF-lac2 and pNiv-CotA/CueO/Yak plasmids.

13.8. Wet lab

Present: Julia, Malin, Waltteri

We run pDF-lac2 and laccase digestion products on gel, extracted samples from a gel and made ligation samples.

16.8. Regular team meeting

Present: Laura, Juuli, Julia, Jenni, Malin, Tiia

We updated each other about important things, for example about our budget and reagent orders.

16.8. Wet lab

Present: Julia, Malin

We produced laccases.

17.8. Wet lab

Present: Julia, Malin

We produced laccases.

18.8. Wet lab

Present: Julia, Malin

We produced laccases.

19.8. Meeting with our partnership team UChicago

Present: Laura

19.8. Wet lab

Present: Julia, Malin

We performed an IPTG induction.

20.8. Wet lab

Present: Julia, Malin

We purified our laccase enzymes.

26.8. Study in Turku fair

Present: Laura, Malin, Jenni, Milja, Tiia

We were presenting our team and iGEM in Study in Turku fair. Because also the Baltic Sea Day was today, we had a poster which contained information about the condition of the Baltic Sea and the proper way of disposing unused medicines.

26.8. Meeting with our partnership team UChicago

Present: Laura



Figure 14. Milja and Tiia in our workshop stand in the Study in Turku fair.

27.8. Visiting Aalto-Helsinki

Present: Malin, Laura, Juuli, Julia

We did a one-day trip to Helsinki to meet another Finnish iGEM team, Aalto-Helsinki. During the day we had workshops and project presentations.

September

1.9. Regular team meeting

Present: Laura, Malin, Juuli

We scheduled some internal deadlines for different tasks and updated each other about the situation of a wiki layout and texts.

2.9. Meeting with our partnership team UChicago

Present: Malin, Laura

5.9. Regular team meeting

Present: Laura, Malin, Juuli

We talked about the recruitment process and scheduled more meetings regarding the writing of both a safety form and an abstract.

6.9. Wet lab

Present: Julia, Malin, Waltteri

We measured laccase activities with a Bradford method.

7.9. Wet lab

Present: Julia, Malin, Waltteri

We measured laccase activities with an ABTS assay.

7.9. Regular team meeting

Present: Laura, Mali, Julia, Juuli, Jenni, Waltteri

We updated each other about important things and planned some upcoming meetings.

9.9. Meeting with our partnership team

UChicago

Present: Juuli, Laura, Malin, Julia

11.9. Regular team meeting

Present: Laura, Malin, Juuli, Waltteri

We planned our education and inclusivity activities and scheduled some meetings. In addition, we took some photos to our guidebook for future iGEM teams.



Figure 15. Photographing session for our guidebook which is meant to help future iGEM teams.

15.9. Meeting with our partnership team UChicago

Present: Malin, Laura, Juuli

18.9. Regular team meeting

Present: Malin, Laura

We wrote wiki texts and gathered some education and communication materials.

19.9. Regular team meeting

Present: Juuli, Laura, Julia, Malin, Milja

We had an emergency meeting regarding our situation and considered how to continue from this. We decided to keep going since we believed that in the end, it would be worth it.

21.9. Visiting Turun Suomalainen Yhteiskoulu Upper secondary school

Present: Laura, Waltteri, Malin, Julia

We visited an upper secondary school here in Turku and tried to spread awareness of synthetic biology and the iGEM competition.

21.9. Regular team meeting

Present: Laura, Juuli, Malin, Julia, Waltteri

We filmed some videos about our study programs for upcoming school visits.

25.9. Wiki writing session

Present: Juuli, Laura, Malin

We wrote our wiki texts together.

28.9. Wet lab

Present: Julia, Malin

We measured laccase activities with a syringaldazine assay.

30.9. Meeting with our partnership team UChicago

Present: Malin, Laura, Juuli



Figure 16. Waltteri and Malin giving a presentation in Turun Suomalainen Yhteiskoulu Upper secondary school.

30.9. Regular team meeting

Present: Malin, Laura, Juuli

We planned our trip to the French Jamboree Meetup as well as updated each other about wiki texts. In addition, we went through our education materials and some other important things.

October

2.10. Regular team meeting

Present: Laura, Malin

We wrote wiki texts and planned both our school visits and Team Aalto-Helsinki's visit to Turku.

3.10. Human Practices meeting

Present: Laura, Juuli

We filmed our sign language videos and wrote some wiki texts about our Human Practices activities.

6.10. Regular team meeting

Present: Laura, Malin, Juuli, Waltteri, Julia

We updated the situation of our wiki texts and school visits.

7.10. Meeting with our partnership team UChicago

Present: Malin, Laura, Juuli, Julia

9.10. Wiki writing session

Present: Malin, Juuli

We wrote together our wiki texts.

10.10. Team Aalto-Helsinki visiting in Turku

Present: Malin, Laura, Juuli, Julia, Waltteri

Another team from Finland, Team Aalto-Helsinki, visited us. We gave them a tour around Turku and in addition, hosted two workshops and a relaxing night playing board games. Topics for our workshops related to getting more iGEM teams from Finland in future and preparing for our upcoming Judging Sessions.



Figure 17. A picture of Aboa and Aalto-Helsinki team members.

12.10. Visiting Nokia upper secondary school

Present: Laura, Malin, Juuli, Julia

We visited the Nokia upper secondary school and talked about synthetic biology and studying biosciences.

12.10. Wiki writing session

Present: Malin, Juuli, Laura

We wrote our wiki texts together.

15.10. Visiting Salo upper secondary school

Present: Juuli, Laura, Malin

As a part of our education activities, we visited Salo upper secondary school. We talked about synthetic biology, its career possibilities and our project.



Figure 18. Malin, Juuli and Laura giving a presentation in Salo upper secondary school.

18.10. Regular team meeting

Present: Juuli, Malin, Laura, Milja, Julia

We went through our wiki pages to make small adjusts and corrections to them. At this point, our internal deadline for wiki texts to be ready has already passed so we basically just read every text and proposed correction suggestions.

19.10. Filming of project presentation video + regular team meeting

Present: Laura, Juuli, Waltteri, Julia

We filmed a part of our project presentation video and after that, finalized our arguments why we should get some special awards, such as the Best Education Award and the Inclusivity Award.