



Medal Submission Document

SenSwiss
Version: August

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January

1. Bronze

1.1 Register on SensUs Connect;



February

1. Bronze

1.1 Posts on connect;



March

1. Bronze

1.1 Motivation;

Our passion for technology and innovation is what pushed us to compete in SensUs. This competition is not only a unique opportunity to apply what we have been learning for years, but also a way to learn first-hand how to build and bring a biosensor to the market, experience the professional world and meet people from around the globe. Our goal is to design and develop a portable device, which is easy to use, able to provide rapid and reliable measurements in saliva. It will be easily adaptable to target different viral strains. The results need to be accurate and quick, to reduce waiting times between tests and results. To build such a device we are currently exploring different technologies, with a focus on microfluidics to automate the processing steps.

1.2 Posts on connect;





Kamalesh Kumar Kanakaraj

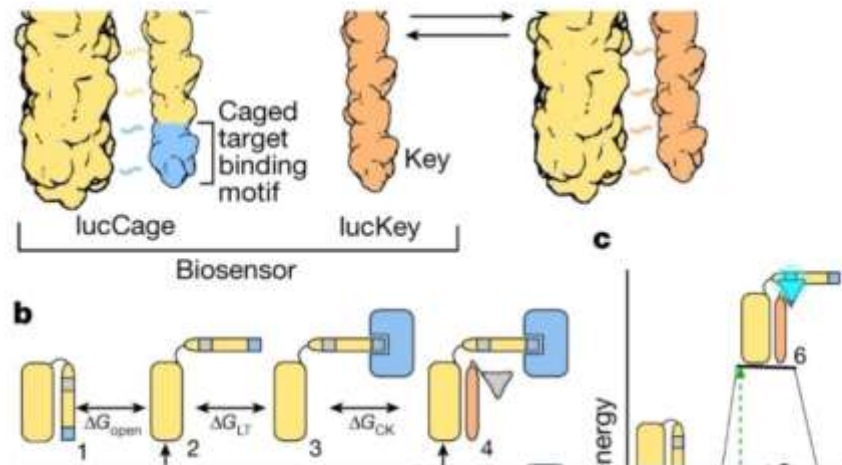
2 days ago

Hey Guys and Gals,

This is Senswiss team. I am sharing a very interesting article I found on protein biosensors for COVID detection with only one target binding domain (minimalistic design) ! I hope it interesting read to you ! Our team SenSwiss is working hard on the design and hope to see ya all in Eindhoven !

<https://www.nature.com/articles/s41586-021-03258-z>

Stay safe and Wear masks



De novo design of modular and tunable protein biosensors

NATURE.COM

A modular de novo designed biosensor platform consisting of a cage and key molecule is developed, and used to create sensors for seven distinct ...

April

Posts on SensUs connect



Deborah Scherrer Ma
14 days ago

Hey everyone!

While searching about point of care (POC) devices, I found this Viewpoint from nature which I found quite interesting. It states that, because many companies have been investing in POC tests for Covid, this will accelerate the adoption of POC tests for many other diseases, including genetic testing for personalized medicine. And of course, biosensors will have a major role in all that! Have you though how the pandemic can change the biosensor world? Just something to wonder about (:

Hope you find this interesting, cheerful greeting from your swiss fellows!

<https://www.nature.com/articles/s41431-021-00816-x>

[Read less](#)


The rise of point-of-care genetics: how the SARS-CoV-2 pandemic will accelerate adoption of genetic testing in the acute setting

NATURE.COM

The SARS-CoV-2 outbreak has necessitated innovation in many areas, including the development of molecular point-of-care tests (POCTs) to facilitate

17 Likes · 1 comment

Like Comment

 **Blanche Berneron**
2 days ago

Hey everyone!


To be more casual, here is a preliminary report that has not been peer-reviewed but yet sounds fun.

https://chemrxiv.org/articles/preprint/CoroNaspresso_A_Cheap_Rapid_and_Simple_Home_Test_for_Nucleic_Acid_Amplification/14224481

They try to develop a cheap device, reusable and can be produced in large amounts in a short period of time. The device was tested for the detection of SARS-CoV-2 RNA ... and several other results with interesting results. When

[Read more](#)

1) Prepare the packaging foam (dry), the 3D printer holder and a clean/dry coffee capsule with c.a. 6 grams of Rultherm R7644C





2) Light up the fire and wait until the water (500mL-1L) boil

CoroNaspresso: A Cheap, Rapid and Simple Home Test for Nucleic Acid Amplification
CHEMRXIV.ORG

Development of a novel LAMP device which is cheap, reusable, and can be produced in large amounts in a short period of time. The device was designed

6 Likes · 2 comments

 Like  Comment

May 1. Bronze

Posting on sensus connect

Nick Mehner
4 days ago

Hi friends 🙌

Wishing you well 🙌

Recently, our team has been thinking about how we might develop our biosensor so that it may continue to be beneficial to communities in the long run and even in a post-COVID world. This got us to take a step back and ponder about whether there might be other communities and regions around the world where the biosensors that all of us are developing at GenSIS may fulfil the need for diagnostics to combat unrelenting diseases (like influenza) in these regions in the years to come.

We would like to share an article with you that we found really insightful as we were thinking through these things. We hope that this quick read will really add value to your project and help to inform how to do your research when your supervisor says to "just research". You may even find some ideas on [how to do your research when your supervisor says to "just research"](#). You may even find some ideas on [how to do your research when your supervisor says to "just research"](#).

[Read more](#)



Assessing the Potential Deployment of Biosensors for Point-of-Care Diagnostics in Developing Countries: Technological, Economic and Regulatory Aspects
NCSUNM 18H-00V

Infectious diseases and antimicrobial resistance are major burdens in developing countries, where very specific conditions impede the deployment of

4 Likes

Like Comment

Johel van der Graaf
21 days ago

Hi everyone!

How's the development of your sensors? We had a lot of fun last week participating in the Pub Quiz! I'll leave you here with this news, about a microfluidic chip to detect SARS-CoV-2 antibodies, which has a very high accuracy and low cost. It was developed in our university (EPFL, Switzerland).

<https://actu.epfl.ch/news/covid-19-test-detects-antibodies-in-hundreds-of-3/>



COVID-19 Test Detects Antibodies in Hundreds of Tiny Blood Samples
ACTU.EPFL.CH

Antibody testing can be a powerful tool for tracking the spread of SARS-CoV-2 infections, the virus responsible for the COVID-19 pandemic. A group of


11 Likes

Like Comment

2. Silver

2.1 Meet with Alumni;

Attendees	Aurélie Ducrot (2020, EPFL-team), Alexandre Daeniker(2019 , EPFLteam), Paul Philipp (2018, EPFL-team)
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Goal of the Meeting	The goal of this meeting is to get feedback regarding the planning as well as the possible incorporation of microfluidics in our sensor. As Alexandre has the most experience in this field we hope he could help us out more. We are also interested in any information regarding the sample preparation protocols they used during their competition year. Our main focus at the moment is to find a positive control for our setup. To determine if our experiments are failing due to the setup or due the antibodies we are using, for this any of them could help us. Next to these main points we are also hoping Paul could help us in getting a better insight of what the industry of POC biosensors looks like.
Date	12/05
Preparation time	Preparation time : We had already been in contact quite a lot with these people so the only real problem was finding the appropriate meeting time as some of them are now working or studying abroad. ~1-2 hours
Duration	~2 hours
Summary	<p>The meeting started off with some casual talks regarding our and their experience with SensUs. Paul Philipp also told us about his experience in the field, the main take-away being that the idea of putting a sensors in a patient's home is unlikely to succeed. Next, we talked about the role of microfluidics, although very very appealing it would probably increase the speed of detection it is very difficult to incorporate on a single use chip, so there needs to be further thought put into, which we will do with Alexander in a separate meeting in the coming weeks. This next meeting will focus on the design of the cartridge we use and how we could link it to a pump to automate the mixing steps. In this regard Alexander also put us in contact with the CEO of Advanced Microfluidics, which we had already met in March. Regarding the planning, it seemed fine to them, they did not have any real feedback at this point. As for the use of a control experiment we are currently talking with a few of the labs which we know have an Elisa type of assay at EPFL. We already did some control measurement using SPR earlier this week.</p>
Evaluation	The meeting was very fruitful and we will most likely keep on meeting with these alumni regularly, as we have been doing before too.
Picture	 <p>Unfortunately, Aurélie had to leave the meeting before we remembered to take a photo with the team captains at the end and Paul's camera was not working.</p>

June


1. Silver

1.1 Interviews with medical professionals;

2. Gold

2.1 Organize online Event;

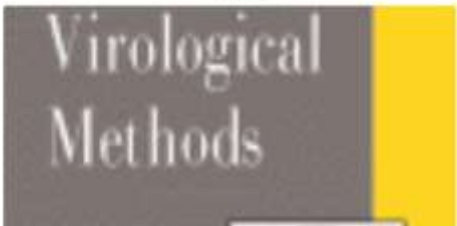
Post on SensUs connect

 **Nick Mahtani**
a month ago

Hi everyone! Wishing you well! ;)

Even though it's currently exam season at EPFL, our team has continued to enjoy wrestling with new challenging questions that we constantly encounter while we build our sensor. Many of these questions concern the saliva matrix that is to be used with our sensor. Hence, here we would like to share an article that we found insightful and helpful while thinking about this and we hope that you would find it helpful too!

[Read more](#)




The use of saliva specimens for detection of influenza A and B viruses by rapid influenza diagnostic tests
SCIENCE DIRECT.COM

Diagnostic tests for influenza infection commonly use nasopharyngeal swabs (NPS) even though these are invasive to obtain. As an alternative ...

9 Likes

Like Comment

 **Aviv Huttner**
2 months ago

Hello everyone ! It's team SenSwiss!

I hope you're doing well 😊

As we all know, Covid-19 changed our way of life, but it also led to some very interesting discoveries in the field of infectious diseases. I stumbled across one of them not long ago, and I found it very enlightening. The article I'm sharing here is about how we wrongly classified the virus transmission. The distinction between airborne transmission and transmission via droplets seems to have been misunderstood for a very long time, as [this article](#) shows it. It is quite long, but well written, and I hope you'll find it instructive.

Of course, it is the Covid-19 pandemic that is at the origin of this progress, but airborne vs droplets is a distinction made for all kind of infectious diseases, like flu, so it is very interesting to realize that it isn't so simple.

Have a nice weekend!

[Read less](#)

6 Likes

Like Comment

July

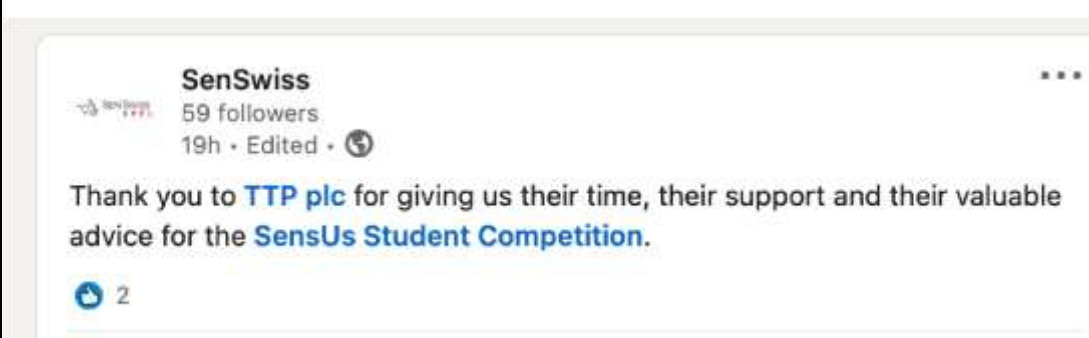
1. Silver

1.1 Meetings with a SensUs Partner;

Partner	TTP
Attendees	Deborah Scherrer Ma, Théo Mayer, Sara Chehtite.
Goal of the Meeting	The goal of the meeting is to discuss about the different strategies to use a flow on the gold nanochips used in our sensor and understand the different challenges which come with it. Furthermore, got insights on our business model.
Date	August 2 nd . It was not possible to do the meeting on July due to the different availabilities of the members of our team and the TPP representants.
Preparation time	1h30
Agenda	<ol style="list-style-type: none"> 1) Overview of our project and prototype (5min) 2) Challenges concerning the fluidic on the cartridge (15min) 3) Business overview (5 min) 4) Closing (1min)
Duration	~25 min
Summary	<p>Technology: Dr. Abi Graham and Dr. Wenshu Xu advised us concerning the cartridge and the fluidics behind it. We asked about how to load a small volume without using a pipette and how the flow can affect our measurement of concentration.</p> <p>Business: they advised us about how to do some estimations concerning the number of people who will be using the device and who to contact so we can do some partnership with them for our business model.</p>
Evaluation	It was a very insightful meeting where we were given some new perspectives of our problems. Dr. Graham and Dr. Xu were both very nice.

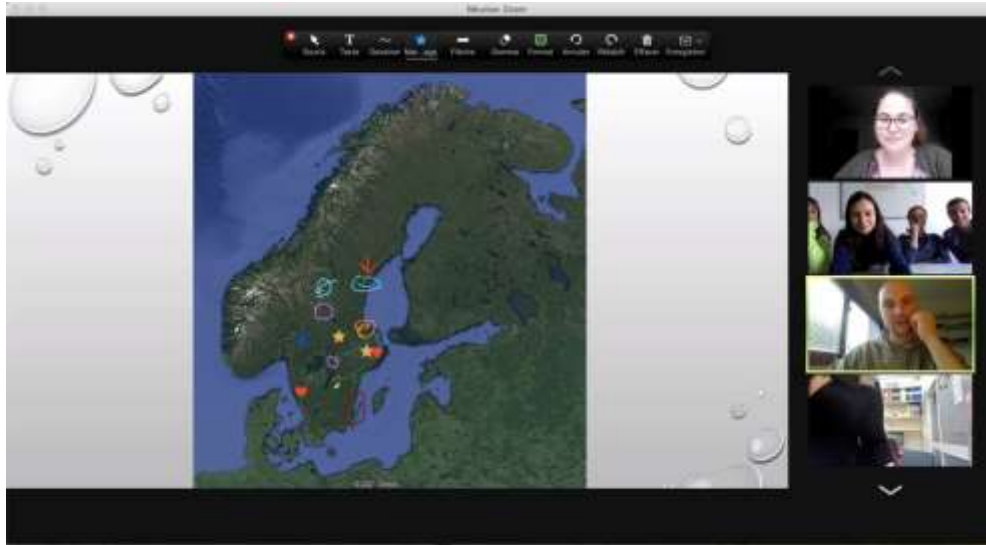
Minutes	<p>Technology:</p> <ul style="list-style-type: none"> • Proteins might get inside the PMMA layers = Find ways to clean it in order to reuse it. • Approximate calculations required: <ul style="list-style-type: none"> ◦ How many molecules do we have? For a volume of 20 μm x 900 μm x 1 cm = 180 nl and a concentration of 0.01 pmol/l, we have 1083 molecules. There are a total of 76 spots so approximately there are 57 molecules in 4 spots (seen on camera). ◦ How many can get attached and how many are available? To be calculated and tested. • Using capillary: Too slow to analyze (goal 10 min) = Better to avoid <ul style="list-style-type: none"> ◦ Use a pump to have a controlled flow. • how to deal with aggregates: The concentrations are too small. It could be that the molecules bond to multiple gold np. We should have more antibodies. The solution should be more dilute. <p>Business model:</p> <ul style="list-style-type: none"> • ATM (Vending machine): People will rent it? How many are likely to use it? Do estimations of the numbers. Estimate the number of people that are likely to use it, the people that can catch it, the people that are going to use it.
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	<ul style="list-style-type: none"> • Available for the general public: challenge is taking the sample properly. If it is easy to use, it can be easy to misuse. Find a way to control the quality of the sample. • Advantage: contaminated people are less likely to interact with people. • Sample collectors will be connected to an automated microfluidics system. But saliva is tricky, there could be leftover food. How would you solve this problem? • Maybe establish a collaboration with the national health system.
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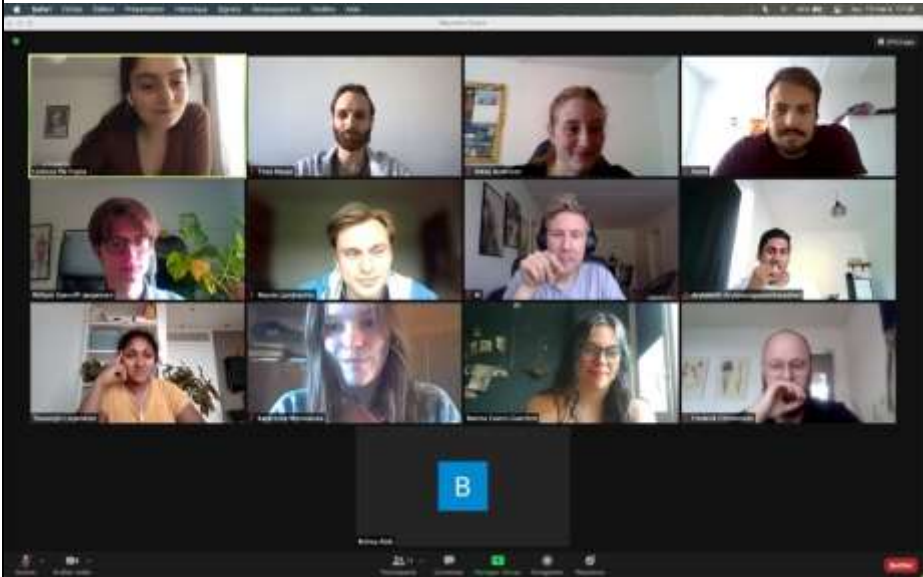
Social Media Post	 <p>Post on LinkedIn</p>
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1.2 Be present at two online events;

Title of activity 1	Pub Quizz
Organized by	UppSens

Date	05 May 2021
Type of activity	Networking
Abstract	The event consisted in different virtual games played in teams, with the goal of knowing more of the cultural characteristics of the different people (e.g. expressions, places, ...)
Objective of activity	Networking between the teams, to get to know each other
Lessons learnt	We learn some funny facts about the different countries which were represented.
Recommendations	It was very amusing, and surely we should do this more times.
Screenshot	 <p>We are at the 2nd little screen, from top to bottom. We were in a group of 6 people on the room, but not all are appearing on the screenshot.</p>

Title of activity 2	« Little Friday »
Organized by	DeTectUs
Date	13 May 2021
Type of activity	Networking
Abstract	Random discussion about funny anecdotes about each participants (e.g. is using the microwave cooking?, ...) and about Denmark
Objective of activity	Networking and getting to know the other teams.
Lessons learnt	This was a good way to do a team building kind of event, and get to know more about each participant, in a funny and relaxed way. To do something similar with the SenSwiss team.

Recommendations	It was cool, we should have more events like this to get to know the other teams better.
Screenshot	 <p data-bbox="571 869 1056 902">Theo Mayer, the SenSwiss representative.</p>

2. Gold

2.1 Present at a professional Event;

Title of event	<Add a title>
Date	<Date of event>

Preparation time	<Preparation time>
Type of event	<e.g. conference, networking>
Abstract	<Brief description of the event. Explain here why it is a professional event>

Objective of event	<e.g. connecting industry with students, giving feedback on current team>
Partners	<Which partners were present at the event? e.g. university organizations, industry, speaker, etc.>
Contact person	<Who can be contacted by the SensUs Organization for questions?>
Evaluation method	<Add a description about how you will evaluate the activity>
Evaluation (fill in after the activity)	
Number of participants	<Number of participants at the event>
Lessons learnt	<Add a description of the lessons that you learned>
Recommendations	<Add recommendations for other local communities>
Picture	<Add a picture or screenshot of you being present here>

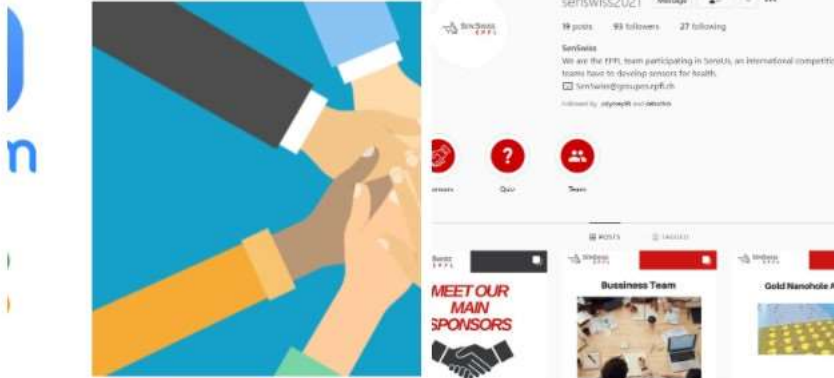


Farida Elharouni

14 hours ago

Did you know that at team SenSwiss, EPFL: we are a team coming from 11 different countries around the world ? At SenSwiss, we believe that effective teamwork begins and ends with communication. We use different platforms: Whatsapp, zoom, google drive and slack to communicate.

If you wanna know more about us make sure to follow us on [LinkedIn](#) and [Instagram](#) @senswiss2021



Like Comment



Théo Mayer

17 days ago



Hey everyone,

SensUs is a great opportunity to learn and all but most of all it's about the new people you meet and the new connections you make. Don't forget to have some fun and learn to know your teammates in a more casual setting as well if you can.

I wish you all a great summer!



♥ 7 Likes · 1 comment

♥ Like 💬 Comment

August

1. Bronze

1.1 Tips for subsequent SensUs Teams

- Tip 1: Search extensively on the labs at the campus which work with biosensor technology, and then find how the SensUs molecule of detection can be used on that technology. We tried to do the opposite (find first papers related to influenza A detection and then the labs which could help implementing that technology). This will make the supervising easier, because the lab will already have more information on the technology.
- Tip 2: Do the planning for all semester quite early. First, do the calendar (in excel or other app able to share with everyone) with all the possible meetings, deadlines, and other dates. Review this calendar often, and at least every time a new information package is given. Give each member of the group a specific task concerning the deadlines. Be careful concerning the deadlines of the medals, which are many and need to be planned in advace.
- Tip 3: Do action points on the PV. At the end of each PV, do action points with specific names of who should do what. This will make easier for people to know what they must accomplish by the end of the week. Review these action points on the next meeting.

- Tip 4: At the beginning, go through SensUs connect to understand how it works, the different tools it has and where to find each document.

Valuable tips in the document:

- Keep in mind that materials usually take some time to arrive. Thus, it is crucial to define early on what you are certainly using and order it from trust-worthy suppliers.
- Split the Team into smaller teams (subgroups) based on different aspects of the project (e.g. chemical-, electrical-, business team), and have a leader for each team.
- Always check whether the information has reached your Teammates, sometimes information is not clear or there are troubles with the tool you are using for communication.
- Do not forget to take some pictures and record some videos of the Team activities (e.g. experiments, discussions, gathering)

2. Silver

2.1 Reposts on social media;

3. Gold

3.1 Post on SensUs Connect every month;

3.2 World-value;