



Sensus

Information Package 2017/2018



Contents

1. Introduction	3
2. Note on terminology	4
3. Theme	4
4. Timeline	5
5. SensUs week	5
6. Rules and regulations	6
7. Biomarker and matrix	6
7.1 Vancomycin	6
7.2 Materials	7
7.3 State of the Art	7
8. Analytical Aim	7
9. Team guidance	8
10. Feedback Moments	9
10.1 Technical & practical Sessions	10
10.2 Entrepreneurship Sessions	11
11. Contact & info	13
11.1 Contact person	13
11.2 Team Page	13
12. Registration and team composition	14
13. Team promotion and team website	14
13.1 Information for the website	14
13.2 Social media	14
14. Sponsors and Partners	15
14.1 Partners in SensUs	15
14.2 SensUs Partners	15
14.3 Classification	15
14.4 SensUs Team Partners	15
14.5 Motivation for partners to work with SensUs	15
14.6 Exposure modalities that can be offered to partners	16
14.7 Consultancy requests to SensUs Partners	17
14.8 Tips for approaching partners	17
15. Appendix	18
Appendix A: Rules and regulations, version December 1 st 2017	18

1. Introduction

Welcome to SensUs 2018, the third edition of the SensUs student competition!

SensUs aims to stimulate education and innovation in the field of biosensing, worldwide. That's why we are very proud that 13 student teams, coming from 4 different continents, will participate in SensUs 2018. The student teams are going to design and build biosensing systems for the detection of Vancomycin, an important antibiotic.

Together we will make SensUs 2018 an unforgettable experience. Last year we launched SensUs Digital, an online platform that enables everybody from all over the world to experience the SensUs event. This means that in September, you will present your prototypes not only to the audience in Eindhoven, but to the entire world!

From now until the event, you are going to design and build a biosensor that could contribute to a better quality of life. This represents a serious interdisciplinary challenge requiring the development of innovative ideas, focused teamwork and necessitating that you make effective use of the technological infrastructure and expertise in your own environment.

In this document we describe a number of basic aspects of the competition, such as the timeline, rules and regulations, contact information, technical details, and other organizational aspects. We hope that this document will help you to kick-start your prototype development. Please contact us if you have any questions, ideas, comments, remarks, etc. In the coming months, further details and updates will be given to you. Keep an eye on the SensUs website and email.

Good luck to all teams of SensUs 2018!

The SensUs Organization, December 1st 2017

2. Note on terminology

- ‘SensUs’, ‘SensUs 2018’ and the ‘SensUs competition’ are defined as the SensUs project as a whole.
- The ‘SensUs organization’ is defined as the group of students who are responsible for the organization of the SensUs competition. The organization can be contacted through email at contact@sensus.org.
- A ‘SensUs team’ or ‘team’ is defined as a group of students who participate in the SensUs competition.
- The ‘SensUs week’ is defined as the week of the SensUs competition when the teams will be in Eindhoven, the Netherlands, namely the period September 5-9, 2018.
- The ‘SensUs contest’, ‘SensUs event’ and ‘contest event’ are defined as the combination of the Testing event and the Public event, which take place on September 7-8, 2018.
- A team ‘supervisor’ is defined as a university professor (full, associate, or assistant) who has sole educational end responsibility for the activities of a SensUs team.
- A team ‘coach’ is defined as a person with a coaching or guiding role towards the team.
- The ‘SensUs website’ is defined as the main website of SensUs: <https://www.sensus.org/>.
- The ‘Team Page’ is the medium that will be used to provide and collect information. This is a folder in Google Drive, to which all team members will have access.
- The ‘Wiki’ is defined as a page of more in depth information about the selected biomarker, vancomycin.

3. Theme

The theme of SensUs 2018 is: **Measuring antibiotics for better healthcare**. The teams will develop innovative biosensors for the detection of vancomycin, which is an important antibiotic drug. The biosensors can have impact in several ways:

- **Drug monitoring**
The monitoring of drug levels helps to provide patients the right therapeutic dose, thereby increasing the effectiveness while reducing unwanted side effects of drug treatment. This Therapeutic Drug Monitoring (TDM) falls in the scope of personalized and precision medicine, which aim to perfectly tune medical treatment to the needs of individual people.
- **Antibiotics**
Antibiotic drugs are widely used in society. Unfortunately, the extensive use of the drugs causes Anti-Microbial Resistance (AMR), which has become a serious global threat. It is important that last-resort antibiotics, such as vancomycin, are used as efficiently and effectively as possible, which is where antibiotic measurements can play an important role.

Your biosensors are most likely to help patients receive the best possible treatment and help society in its fight against antimicrobial resistance.

4. Timeline

<i>Date</i>	<i>Topic</i>	<i>Short Description</i>
<i>December 1</i>	Release of final version Information Package	
<i>December 15</i>	Team information	Upload information for the website to your individual Team Page
<i>Beginning of January</i>	First Feedback Moment	See section 10.1
<i>End of January</i>	First Entrepreneurship Session	See section 10.2
<i>March 1</i>	Contest Document	This document contains important information about the contest week of SensUs 2018, regarding registration, provided facilities, required preparations, assessment criteria, etc.
<i>Beginning of March</i>	Second Entrepreneurship Session	See section 10.2
<i>End of March</i>	Second Feedback Moment	See section 10.1
<i>End of April</i>	Third Entrepreneurship Session	See section 10.2
<i>End of June</i>	Third Feedback Moment	See section 10.1
<i>End of June</i>	Fourth Entrepreneurship Session	See section 10.2
<i>September 5-9</i>	SensUs week	During these days all teams will convene in Eindhoven
<i>September 7-8</i>	SensUs contest	Your biosensing systems will be tested and shown to the public!

Table 1: Calendar SensUs Competition

5. SensUs week

All teams will convene during the SensUs week from Wednesday the 5th of September till Sunday the 9th of September in Eindhoven, The Netherlands.

As stated in the rules and regulations, travelling to and from Eindhoven should be arranged and paid by the participating teams themselves. The SensUs Organization arranges a stay in Eindhoven during the contest week for the participating student teams. In addition, the SensUs Organization will provide food and drinks during the whole week.

On Wednesday the 5th of September you will be welcomed in Eindhoven. The SensUs contest itself will take place on Friday 7th and Saturday 8th and will be open for public. On Sunday the 9th of September we will close the SensUs week together and you will head home afterwards. Besides the contest, there will also be fun activities, but also other activities like interaction with professionals during the SensUs week. These are organized by the SensUs organization, with the aim to get to know each other and create some good memories.

6. Rules and regulations

The rules and regulations of the SensUs competition can be found in Appendix A. In case the rules and regulation are changed, you can find the most recent version on the SensUs website. We expect you to comply with these rules at any time during the SensUs competition; **your agreement with this document need to be confirmed by e-mail**. The SensUs organization reserves the right to impose consequences onto a team for missing a deadline or for not following the rules.

7. Biomarker and matrix

7.1 Vancomycin

Vancomycin ($C_{66}H_{75}Cl_2N_9O_{24}$) is a glycopeptide antibiotic naturally produced by the soil bacterium *Amycolatopsis orientalis*. It works by impeding the cell wall synthesis of bacteria. It is used in patients as a last resort to treat life-threatening infections caused by gram positive bacteria that are already resistant to other classes of antibiotics - such as Methicillin-resistant *Staphylococcus aureus* (MRSA). More information on vancomycin can be found on [the Wiki](#).

It is important for patients who are on vancomycin treatment that their vancomycin blood levels stay within a narrow therapeutic concentration range. If the concentration of vancomycin is too low, treatment is ineffective. In addition, the chance that bacteria develop resistance to vancomycin increases (it should be noted that this has not yet been fully proven on humans). If the concentration of vancomycin is too high, vancomycin has been linked to serious side-effects, including nephrotoxicity and ototoxicity. Since there is large interpatient variability when it comes to vancomycin pharmacokinetics, standardized recommendations for vancomycin dosing are extremely difficult to make. Patients are preferably individually and closely monitored for their blood levels to stay within the therapeutic range - meaning that there is a need for biosensing close to the patient.

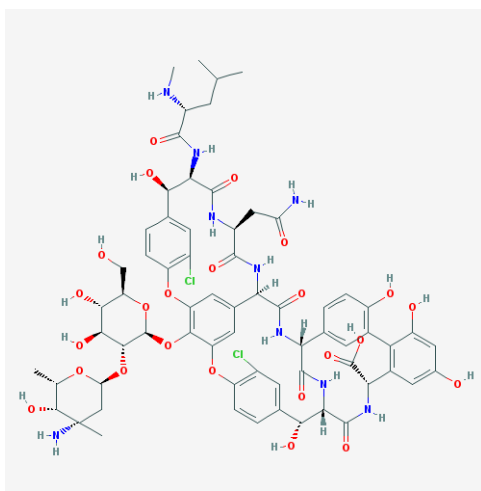


Image 1, Vancomycin chemical structure ¹

¹ Structure [Data deposited in or computed by PubChem]. (n.d.). Retrieved from <https://pubchem.ncbi.nlm.nih.gov>

7.2 Materials

In the competition we will use the analytical grade vancomycin **PHR1732-4X250MG vancomycin hydrochloride from Sigma Aldrich**. To be bought at:

<https://www.sigmaaldrich.com/catalog/product/sial/phr1732?lang=en®ion=NL>

The recommended amount of vancomycin is one such package. The matrix that will be used is anti-coagulated human blood plasma. The recommended amount of plasma to be purchased per team is roughly 100 mL.

7.3 State of the Art

The SensUs competition wants to stimulate the development of molecular biosensing devices, which are small devices that can be used at the bedside of patients or even at home i.e. handheld devices. Currently no handheld or tabletop point-of-care devices for detecting vancomycin are available on the market. As a result, continuous monitoring of vancomycin levels is currently next to impossible, which means that physicians usually work with standardized doses and therapies which are not optimized.

Table 2 shows a selection of currently available sensing systems for vancomycin. These are all large instruments which are found in laboratory environments. All these products are based on competitive immunoassays to detect vancomycin in blood plasma or serum.

Company	Product	Test name	Sample Volume	Reportable range	Precision	Time to Result
Abbott	Architect ^[2]	iVancomycin	20 µL	3 - 100 µg/ml	CV: <10%	16 min
Roche	Cobas c311/511 ^[3]	VANC3	2 µL	4 - 80 µg/mL	CV: <11%	10 min
Beckman Coulter	AU480 ^[4]	Emit ® 2000 Vancomycin Assay	2.4 µL	2 - 50 µg/mL	CV: <5%	8 min and 38 sec

Table 2: A selection of currently available systems for measuring vancomycin

More information on the state of the art, including other measuring methods for vancomycin can be found on [the Wiki](#).

8. Analytical Aim

The analytical aims of the competition are derived from a future near-patient testing setting, where vancomycin is measured in a finger-prick sample by a person who does not have a medical background.

We propose the following technical aims:

- **Concentration range**

² http://www.illexmedical.com/files/PDF/Vancomycin_ARC.pdf

³ http://labogids.sintmaria.be/sites/default/files/files/vanc3_2016-10_v1.pdf

⁴ http://www.beckmancoulter.com/wsrportal/techdocs?docname=/cis/4W052/%25%25/EN_VANCOMYCIN.pdf

Blood plasma samples will be tested containing vancomycin in a clinically relevant concentration range. **The vancomycin concentration in the test samples will range between 0-100 microgram/milliliter.**

- **Accuracy and precision**

The test results should be analytically accurate. We will implement this by checking if reported data fall within a predefined accuracy bandwidth. Data outside the accuracy bandwidth will be deemed invalid (*bandwidth to be determined*). Based on the valid data points in the correlation plot, the biosensor precision and accuracy will be calculated and bonus points will be given (*formula to be determined, bonus scheme to be determined*).

- **Speed**

The time-to-result should be as short as possible. During the contest, the time interval between samples will be a few minutes (*exact time interval to be determined*).

- **Sample handling outside the cartridge**

Ideally a near-patient test involves no sample preparation outside the cartridge, i.e. a sample is immediately applied to the cartridge. For practical reasons, it will be allowed during the contest to add reagents to the plasma sample prior to insertion into the cartridge. However, we want to stimulate teams to dilute as little as possible. The maximum allowed dilution is a factor 10 and bonus points will be given for lower dilutions (*bonus scheme to be determined*).

- **Sample volume**

The used sample volume should be as low as possible. The maximum sample volume per test is 20 microliter and bonus points will be given for use of lower sample volumes (*bonus scheme to be determined*).

- **Size**

The total biosensor system should be able to fit on a table. The biosensor system (excluding laptop) may not be larger than 80cm x 80cm x 50cm.

- **Biomaterials and reagents**

Teams may use biomaterials from external sources (e.g. antibodies) in their biosensor. However, teams are not allowed to use an assay kit with unknown composition. A biosensor is only admitted to the competition when the team knows the molecular composition of all reagents and can disclose all assay processes used in the biosensor.

For the ranking of analytical performance, we will develop a system that gives bonus points for:

- High speed
- High precision and accuracy
- Low dilution and low sample volume

Technical information that still has to be determined will be provided to you via updates in the Team Page as soon as possible. More information about the setup of the contest and about the judgement method will be provided in the Contest Document.

9. Team guidance

The SensUs project is highly challenging and demands a high level of motivation and initiative of the students. The learning process is guided by a supervisor and coaches. Every team has a supervisor who is an university professor. Next to the supervisor, other staff members have a coaching role, e.g. a PhD student, postdoc, and/or senior researcher. Here we describe how the supervision and coaching may work in practice.

- **Supervisor**

The supervisor provides the necessary boundary conditions. The supervisor embeds the



project in the university system and has the educational end responsibility for the activities of the team. The supervisor is responsible for the formation, supervision and coaching of the team. The supervisor helps the team to get access to laboratories, ensures that the students follow all required safety trainings, and that they are covered by insurances necessary for their SensUs work.

- **Coach**

The coaches help the team by regularly meeting and discussing with the team, e.g. on a biweekly or weekly basis.

- **The team**

The team is responsible for generating ideas and for taking decisions on what they want to develop in the SensUs competition, e.g. which technology they want to use for their biosensor, with whom they want to collaborate, and how they want to develop their business model. The coaches and supervisor help the students in their development process, e.g. by suggesting literature, by suggesting experiments, or by suggesting to approach experts or companies. The coaches and supervisor help the team to avoid making large mistakes, so that there is a good chance that the team can demonstrate a working prototype at the SensUs contest. Importantly, the coaches and supervisor are not allowed to steer and force what exactly the team should do. It is fully the responsibility of the team to take all positive decisions.

- **Regular meetings**

We recommend that the coach and team have at least a one-hour meeting every two weeks. The coach should also be reachable outside the regular meetings, for questions or for brief discussions. In the meetings, the team can explain what they have done, ask questions, and discuss any problems. The coach should stimulate discussion in the team rather than steer what the team should do. When the team discovers that they might have gone wrong, the coach can be of help in pointing out where the mistake was made.

- **Help keeping track of time**

Time management is extremely difficult in a technological development process. The coach should help the team to not fall behind schedule. Coaches can urge the team to get started, which usually means doing experiments or ordering necessary parts and materials. Even when the team is having difficulties or is on a wrong path, it is important that the students keep being active on their project and focus on finding solutions for the problems.

- **Mediate in case of conflicts**

The coach and supervisor should act as mediators when a conflict occurs in the team. They have a neutral stance and oversee the project as a whole. When a team is not able to work out a conflict on their own, it can be a big help to involve an outsider.

- **Evaluation and feedback**

We recommend that team, coaches and supervisor have a Feedback Moment every few months, in order to evaluate communication and roles.

10. Feedback Moments

The SensUs 2018 organization would like to keep track of the progress of all the participating teams. This information will help to evaluate the process of the teams towards the contest event and the

organization will help where possible. We will do this by having contact moments via Skype on technical, practical and entrepreneurial aspects of your progress.
The organization will do their best to ensure everything runs smoothly, but if there are points of improvements or support needed, please inform us.

10.1 Technical & practical Sessions

One way to keep track of the progress is by Feedback Moments about technical and practical issues. This will be helpful for both the teams and the organization.

There are three Feedback Moments listed for these subjects. Before these moments, a brief document summarizing your progress is expected. A more detailed guide about the requirements will be provided several weeks before every Feedback Moment. By then, the organization will contact you to arrange a suitable moment.

10.1.1 General information

- The Feedback Moments via Skype will take 20 minutes.
- We have experienced that a minimum number of 3 students is needed to have a good feedback meeting. It is not necessary for all team members to join, but it is allowed.
- There will be a maximum of 8 slides, for the presentation of each Feedback Moment.

10.1.2 First Feedback Moment

Date: Beginning of January

Subject: "Meeting and Planning"

This Feedback Moment focuses on getting to know each other and on your general planning, including the design steps that are to be taken and the timeline on these steps. How is your team doing, how are the coaching and supervision arranged? Do you have access to labs? Indicate where you are in the design process and give a short summary of the progress so far. An example of a possible framework for the design process can be found in Table 3. Please note that this is merely a suggestion, and not a requirement. It is included to inspire, not to restrict.

Step	Phase	Description	Timetable	Status
1.	Formulating the design question	An outline of the Requirements and Preferences that the design has to satisfy, plus the Constraints that should be considered (RPC's).	Identify range.	Done.
2.	Literature research	-	Identify range.	In progress.
3.	Concept formulation	Creating creative ideas and implementations for the design.	Identify range.	Not started yet.
4.	Preliminary design	Prototype one of the designs and make a mock-up.	Identify range.	Not started yet.
5.	Detailing	Further elaboration of the design, while still satisfying the RPC's.	Identify range.	Not started yet.
6.	Realization	The actual building of the design.	Identify range.	Not started yet.
7.	Testing	Testing the performance of the device.	Identify range.	Not started yet.

8.	Evaluation	A reflection on the design process, outlining the successes and possible improvements.	Identify range.	Not started yet.
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Table 3: Example of general planning for a design process

10.1.3 Second Feedback Moment

Date: End of March

Subject: "Which choices did you make?"

This Feedback Moment focuses on the outline of your sensor system. This includes a rough description of the design of the sensor system and underlying techniques. Report on how your team progressed so far and what steps in the design process still have to be taken. Reflect on the general planning that you made for the first Feedback Moment.

10.1.4 Third Feedback Moment

Date: End of June

Subject: "Will you be ready for the competition in September?"

For the third Feedback Moment, please tell us how you have progressed so far. Where are you in the design process, how is your planning, how is your team doing, are you getting ready for the contest in September?

10.2 Entrepreneurship Sessions

One of the awards of the competition is granted for the Translation Potential, which focusses on future applications in healthcare, industrialization potential, and business perspective of the biosensing technologies developed by the teams. The SensUs organization wants to help the teams improve their entrepreneurship skills, enhance the translational potential of their solutions, and decrease the gap between invention and innovation. Therefore, SensUs 2018 offers the students an entrepreneurship training with online lectures, small assignments, and Feedback Sessions. The components of the training are:

- Introduction to entrepreneurship and entrepreneurial decision making
- Business models
- Lean Startup
- Pitching

The emphasis of the entrepreneurship training is on coaching and the presented theory should give immediate added-value for the teams in their quest of developing solutions with high market attractiveness. The training provides easy-to-use tools and methods to guide the innovation process. It is up to the teams to which degree they use the assignments & feedback and implement recommendations (similar to the technical Feedback Moments that the SensUs organization offers).

Two professors from the Innovation, Technology Entrepreneurship & Marketing (ITEM) group at Eindhoven University of Technology provide the feedback. The teams are stimulated to apply the concepts from the web lectures in small assignments. At the Feedback Session, the assignments are discussed and coaching on the progress regarding the business potential of the developed solutions is given. There are four Feedback Sessions listed.

10.2.1 General aspects

The training is split in four main phases, following the adjusted business model Lean Canvas. Each phase includes a web lecture, a small assignment that assists in developing a compelling business model and a Feedback Session. The iterative process consists of 3 assignments and will help the teams to have a desirable outcome at the end of their SensUs project. Below some practicalities:

- Students are invited to watch the indicated pre-recorded web lectures, do the assignments and submit the results via uploading them to the “Assignments” team folder on Google Drive, 3 working days prior to the Feedback Session.
- The first web lecture will take 30 minutes, the next vary between 5-15 min. Addressing each assignment will take about 2-4 h per week.
- The web lectures and assignment instructions will be posted in the “Instructions & Toolbox” team folder in the Team Page.
- The first Feedback Session will take 20 minutes. Subsequent sessions will take 15 minutes.
- Every team appoints at least one person who takes the lead for the entrepreneurship sessions. This person can distribute tasks within the team and is always present at the Feedback Sessions to give a status update on preliminary results. It is beneficial if more team members join the Feedback Sessions, but this is not a requirement.
- Appointments for the Feedback Moments will be managed by the two professors who will get in touch with the teams in due time.

10.2.2 Session 1

Date: End of January

Subject: “Problem definition and validation”

Preparation/ introductory session:

Pre-recorded web lecture on Innovation & Entrepreneurship: Introduction to viable business model development and the Lean Canvas concept, with an explanation of the suggested overall planning for the entrepreneurship part.

There is no assignment to be handed in before the first session. Assignment 1 can however already be read and questions can be answered during the Feedback Session.

Feedback Session: This Feedback Moment focuses on getting to know each other, the team’s planning regarding the entrepreneurship part, and questions related to Assignment 1.

Assignment to be prepared for the next Feedback Session: Assignment 1 - Basic Stakeholder Analysis to validate problems that arise from the new biosensor development.

10.2.3 Session 2

Date: Begin of March

Subject: “Solution development and validation”

Preparation:

Submit results of Assignment 1;

Web lecture on Value Proposition Canvas;

Have already a look at assignment 2

Feedback Session: Feedback on results of Assignment 1



Assignment to be prepared for the next Feedback Session: Assignment 2 - Using the Value Proposition Canvas as a tool to determine the best solution

10.2.4 Session 3

Date: End of April

Subject: "Business model validation"

Preparation:

Submit results of Assignment 2

Have already a look at assignment 3 (web lectures of Session 1 are useful)

Feedback Session: Feedback on results of Assignment 2

Assignment to be prepared for the next Feedback Session: Assignment 3 – A look at economic aspects of the business model to build a sustaining business around the developed solution

10.2.5 Session 4

Date: End of June

Subject: "Translational potential [and pitching]"

Preparation session:

Submit results of Assignment 3

Decide whether your team wants feedback on their pitch in August

Feedback Session: Feedback on results of Assignment 3;

Optional: Session 5 in August: Feedback on pitching.

11. Contact & info

To contact the SensUs organization, you can send an email to the secretary, using the general email address contact@sensus.org. If necessary, the emails will be forwarded to the related person. The SensUs organization will reach out to the teams via email and will provide and collect information via the Team Page.

11.1 Contact person

To facilitate effective communication between the team and the organization, we would like to have **one student per team** as a contact person. The contact person will be our first point of contact concerning questions or information to share with the team. The contact person will get access to the Drive (for further information about the Drive and the Team Pages, see "Team Page"). Therefore we need a valid Gmail email address. Please send an email to contact@sensus.org with the information of the contact person, consisting of: name, phone number, personal email address, and Gmail email address.

11.2 Team Page

This year the SensUs organization will provide and collect information via Google Drive, which will be referred to as the Team Page.

The folder named “SensUs 2018 | Information for all the participating teams” will contain important documents and will be available to all participating teams. When new documents are uploaded, the contact person of your team will be informed by email.

Furthermore, there will be a private folder for all the individual teams. The folder is named according to the name of your University. The folder contains i.a. your Team Page, which is intended to gather the information from your team. During the year, more information can be required. The SensUs organization will expand the Team Page and send you a request to complement the information in the Team Page.

All the participating team members, coaches and supervisors of each team will get access to the Drive. In order to achieve this we will need the Gmail email address of the contact person. After sharing the Drive with the contact person, he or she can share the Drive folder with the other team members.

12. Registration and team composition

In order to register as a team member, the information in the Team Page under Team Participants must be completely filled in *before December 15*. It is allowed to later add more students to the team, they should register as soon as possible and this should be communicated to the secretary. For the rules about the composition of your team, we advise you to go through the “Team composition” section in the rules and regulations in appendix A.

13. Team promotion and team website

13.1 Information for the website

We will show all the participating teams of SensUs 2018 on our website www.sensus.org. In that way visitors can view all 2018 teams on our website. In order to do so, we would like to receive the following information:

- A picture with all the team members.
- The name of your team.
- A short description of your team (approximately 170-250 words). For example, you can write something about your learning goals, aims or motivations.
- A short bibliography about your supervisor and coaches (two sentences per person).

Please upload this information to your individual Team Page *before December 15*.

13.2 Social media

Social media are an important aspect of the competition, we strongly recommend using it. During the competition, the Public Inspiration Award will be given to the team that gets the most votes from the public. Therefore it is important to be known by the public, this can be accomplished by using social media. Last year we noticed that the two teams who had put the most effort in promoting themselves on social media won the first and second prize in

the 'Public Inspiration Award'. Besides, the use of social media makes your team more professional and can help in the search for potential partners.

14. Sponsors and Partners

This section aims to inform you about sponsorship and partnership within the SensUs competition.

14.1 Partners in SensUs

Official partnerships are great for SensUs as these show that professionals stand behind our work and vision, which aids to our credibility. Furthermore, they help us to realize our activities in multiple ways. This can be financially, or in-kind, e.g. by supplying materials or by providing expertise. In return, we try to offer them what they are most interested in, e.g. publicity, networking, or interactions with students. We distinguish two categories: Partners who support SensUs as a whole, and Partners who support individual teams.

14.2 SensUs Partners

The goal of the SensUs organization is to create an interesting portfolio of partners who are likely to work with the SensUs organization for several years. You find the partners on the SensUs website. We are constantly looking for organizations wanting to cooperate with us, who agree with our vision and are interested in the field of biosensing, the competition or in working with the participating teams.

Besides financial support to help the SensUs organization to realize the Contest Event, SensUs Partners also have expertise in different fields which can benefit the teams. That is why we want to make it easy for teams to get into contact with our partners.

14.3 Classification

Partners in SensUs are currently either "Sponsors" or "Affiliates". Sponsors contribute financially and generally also give in-kind contributions. Affiliates do not give financial support, only in-kind contributions, typically consultancy.

14.4 SensUs Team Partners

These partners support individual Student Teams. We stimulate teams to look for partners either locally or globally. In this way the teams can get financial support, material- or knowledge wise for the development and testing of their sensor and for the travel to Eindhoven. We welcome any partner organization that is enthusiastic about biosensing and about working with students.

14.5 Motivation for partners to work with SensUs

Working with partners means offering something in return for their help. As every partner is different, their interest vary. The key is to listen to what partners are interested in and maybe even come up with new ways to work together, so do not hesitate to ask partners for suggestions. From our own experience, we have seen the following motivations for companies to become a partner of SensUs:

- **Exposure**

Organizations can be interested in exposure, in order to promote their name amongst students or to become better known to the general public. Exposure can be given by mentioning them on the organization website and/or team website and by displaying them on the event. Sometimes partners provide materials in order to build a relationship with students and/or professors.



- **Entering the biosensing market**

Companies may be interested to become active in the biosensing market. Supporting SensUs could give them exposure to an audience interested in biosensing and allows them to get in touch with other companies in the field of biosensing.

- **Knowledge transfer**

Experts in companies and other organizations are often passionate about their work. They are interested in sharing their knowledge with students, and vice versa they are very interested to become inspired by passionate students. The organization fulfills this interest by offering companies the possibility to have consultancy sessions with teams.

- **Recruiting new employees**

Some companies are very interested to get in contact with highly talented students, so they can later recruit them as employees. They like to come to the contest in order to meet with the teams.

- **Other interests**

As already mentioned, every partner is different, so there might be motivations that we have not seen yet. If you encounter any new form of cooperation which other teams might learn from, please share them with us!

14.6 Exposure modalities that can be offered to partners

You can offer several exposure modalities to potential partners, both before the Contest Event and on the Event itself.

- **Event**

At the Event we will attract several hundreds of attendees in real life and we aim to attract thousands of attendees remotely on the live stream on SensUs Digital. The attendees are enthusiastic about (medical) technology and biosensing in particular. The event will offer several opportunities to learn about molecular biosensors for an international audience. At the event, when agreed upon by the SensUs organization, partners will have the opportunity to inform the public about their company and demonstrate how their activities and interests are related to biosensing. Sponsors from outside the Netherlands might not be able to be present in person. Still they can supply posters, banners, flyers, video's, etc.

It is also possible to highlight your partners and their possible roles in your pitch presentation. It will add great value if you can show that your team has worked together with external experts and companies. On your clothing you can also show logos of your partners. Furthermore, we advise you to organize a try-out event with your sponsors. This will allow you to rehearse your pitches and show your posters to your sponsors. They will give very useful comments and suggestions that will make your presentation better!

- **SensUs Organization website**

Via the website www.SensUs.org we want to show the world how SensUs is developing and try to form our own identity and brand. As the event will come closer, we will tweak and promote our website more in order to motivate people to visit our event and hopefully create more website traffic. Team sponsors can be displayed on team-specific sections of the website.

- **SensUs team website**

In order to increase the chances for experts to reach out to you and to optimize help from local resources, we stimulate teams to develop their own identity and website. On this website the teams of course can mention their partners and if desired the role they play in the development of the sensor. The SensUs organization offers the possibility to host your website free of charge. If you are interested in this service, please contact us.

- **Keep in touch**

As a way to keep the partners informed, it is a possibility to send them our newsletter. You can either do this yourself or let us know who we should send it to. In this way, the readers see how SensUs is developing and may become partners in the future.

14.7 Consultancy requests to SensUs Partners

The SensUs organization aims to facilitate consultancy between experts and the student teams in order to benefit the design process. All our partners are willing to give consultancy to the participating teams. This means that there is a broad spectrum of expertise to help you with questions that you might have concerning the development of your biosensor.

14.8 Tips for approaching partners

To help your team expand its own network we have some tips:

1. Always be professional
 - a. Know what area the potential partner is specialized in
 - b. Use formal communication
 - c. Know what you want and/or need from the partner you are approaching
2. Try to expand the network of the team. With this network it is easier to meet potential partners. Some ways to expand your network:
 - a. Attend network events
 - b. Present your team at events related to e.g. biosensing, healthcare, antibiotics
 - c. Have a personal LinkedIn page so you can find companies and companies can find you
 - d. Try to use your own network: you might be surprised about how resourceful it already is. E.g. family, acquaintances, colleagues and professors
3. After you have made contact with a potential partner, try to stay in contact and underline the value of your team.

If you have any questions regarding sponsors, please contact us via external@sensus.org.



15. Appendix

Appendix A: Rules and regulations, version December 1st 2017

(In case of changes, these will be implemented on www.sensus.org)

1. Definitions

- 1.1.1 'SensUs', 'SensUs 2018' and the 'SensUs competition' are defined as the SensUs project as a whole.
- 1.1.2 The 'SensUs organization' is defined as the group of students who are responsible for the organization of the SensUs competition. The organization can be contacted through email at contact@sensus.org.
- 1.1.3 A 'SensUs team' or 'team' is defined as a group of students who participate in the SensUs competition.
- 1.2.1 The 'SensUs week' is defined as the week of the SensUs competition when the teams will be in Eindhoven, the Netherlands, namely the period September 5-9, 2018.
- 1.2.2 The 'SensUs contest', 'SensUs event' and 'contest event' are defined as the SensUs days which take place in the Netherlands, on September 7-8, 2018.
- 1.3 A team 'supervisor' is defined as a university professor (full, associate, or assistant) who has sole educational end responsibility for the activities of a SensUs team.
- 1.4 A team 'coach' is defined as a person with a coaching or guiding role towards the team.
- 1.5 The 'SensUs website' is defined as the main website of SensUs: www.sensus.org
- 1.6 The 'Team Page' is the medium that will be used to provide and collect information. This is a folder in Google Drive, to which all team members will have access to.

2. Team composition

- 2.1 For the participating teams, a maximum size of 15 students is allowed. It is strongly recommended to have at least 8 students in a team.
- 2.2.1 Students can participate in a team when they are enrolled in a Bachelor's or Master's program during the SensUs competition.
- 2.2.2 Students who are enrolled in a Master's program cannot participate in SensUs 2018 if they graduate before June 1st, 2018.
- 2.2.3 PhD students cannot participate in a team, with one exception: PhD students can participate in a team if they are enrolled in a PhD program and obtained the Bachelor's degree no more than 12 months previously to the SensUs contest event.
- 2.2.4 Students who have participated in previous editions of SensUs are allowed to participate in the SensUs competition 2018, provided that they meet the requirements mentioned above.
- 2.3 For each university team, a university professor (as defined in 1.1.2) acts as the supervisor. The supervisor is responsible for the formation, supervision and guidance of the participating team.
Note: It is advised that professors involve an additional staff member in the guidance of the team (e.g. another professor, a postdoc, or a PhD student).
- 2.4 In each participating team, one student acts as the contact person towards the SensUs organization.

- 2.5.1 By joining a team, every team member consents with being shown on the SensUs website. This includes names, surnames and pictures.
- 2.5.2 In case a team member would like to object to being shown on the website, the person himself/herself is responsible to communicate this to the organization.
- 2.6.1 Each team chooses a team name. This name will be used to represent the team in public, e.g. on the SensUs website and during the contest event.
- 2.6.2 Team names need to be proposed to and accepted by the SensUs organization.
- 2.6.3 The proposed team name can be rejected if there is not sufficient distinction between the names of different teams.
- 2.6.4 The proposed team name can be rejected if the SensUs organization deems the name to be in conflict with the vision and mission of the SensUs competition.
- 2.6.5 The proposed team name is not allowed to directly refer to a non-academic sponsor. However, it is allowed to make an indirect reference to a non-academic sponsor.
- 2.6.6 The final judgement about the proposed team name is at the discretion of the SensUs organization.

3. The contest event

- 3.1 During the SensUs competition, every team designs and builds a prototype biosensor system for the measurement of a given biomarker in a given matrix. *Further information about the biomarker and matrix can be found in the Information Package and the Contest Document.*
- 3.2 The contest event includes the testing of biosensor prototypes (Testing Event) and presentations for a general audience (Public Event).
- 3.3 During the contest event, teams will be judged on data produced during the testing event, supporting information, posters and presentations. In this judgement, several aspects will be taken into account. *The different aspects are described superficially in the Information Package and in more detail in the Contest Document.*
- 3.4 At the end of the contest event, the jury will confer awards. *The different awards are described superficially in the Information Package and in more detail in the Contest Document.*
- 3.5 The jury is composed by the SensUs organization with the intention of creating a judgement with representation of different stakeholders, e.g. university professors, representatives from companies and healthcare representatives.
- 3.6 The teams should provide information to the jury in a transparent and truthful manner. Fraudulent or misleading behavior can lead to disqualification of the team. This is at the discretion of the jury and the SensUs organization.
- 3.7 Travelling to and from the Netherlands should be arranged and paid for by the participating teams themselves. The SensUs organization arranges a stay for the teams during the contest event.

4. Safety

- 4.1 The participating teams are required to follow all safety and insurance rules of their institution and their respective countries. **Failure to do so can result in disqualification from the competition at the discretion of the SensUs organization.**
- 4.2 For every team, the supervisor ensures that the team members follow all required safety trainings and are covered by insurances necessary for their SensUs work.
- 4.3 Teams are required to minimize the use of harmful chemicals.

- 4.4 Teams are required to build their prototype biosensor system in such a way that the device is able to function outside a laboratory environment. All equipment must be able to function safely in a public setting.
- 4.5 Every team must inform the SensUs organization about potential safety risks of their biosensor system. This information must be provided to the SensUs organization **no later than six weeks before the contest event**.
- 4.6 During the stay in the Netherlands for the SensUs event, teams are required to follow all safety rules set by the SensUs organization and the location of the Testing and Public event.

5. Intellectual property

- 5.1 The Testing event and the Public event occur in the public domain. Therefore, demonstrations and presentations of the biosensors occur in the public domain.
- 5.2.1 If a participating team or its university wants to secure patent rights, it is their responsibility to do so before the contest event.
- 5.2.2 The SensUs organization is not involved in the securement of patent rights and does not cover any IP-related costs of the teams.

6. Deadlines, changes, cancellation

- 6.1 The SensUs organization reserves the right to impose consequences onto a team when it misses a deadline or it fails to follow the rules.
- 6.2 The SensUs organization reserves the right to cancel or change the contest event in case of circumstances that strongly affect the competition.
- 6.3 The Rules and Regulations may be subject to change at the discretion of the SensUs organization. The participating teams will be informed about these changes. The latest version of the Rules and Regulations is available on the SensUs website.

7. Responsibility

- 7.1 The SensUs organization is not responsible for any loss or damage. This includes but is not limited to: chemicals, the biosensor systems, posters and banners.
- 7.2 Team members are responsible for their own belongings during their stay in the Netherlands.

8. Use of SensUs Identity

- 8.1 Please contact the SensUs Organization for the use of any component of the SensUs identity. This includes but is not limited to:
 - The SensUs logo
 - Photos or video recordings of the event
 - Logos and images of participating sponsors