

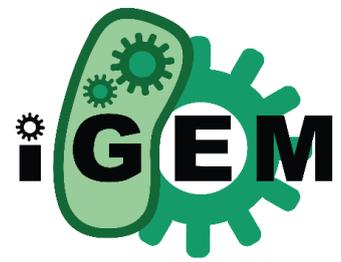
SPONSORING PROSPECTUS

iGEM 2021



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WHAT IS iGEM?

02

The international Genetically Engineered Machine (iGEM) is a competition in the field of synthetic biology for students around the world. The competition had its origin at the Massachusetts Institute of Technology (MIT) in Boston and is now organized by a non-profit organization.

Over the years iGEM has grown to one of the biggest student competitions in biosciences worldwide with about 300 multidisciplinary teams from more than 44 different countries. The goal of the competition is to tackle important problems by using genetic engineering methods. iGEM is an opportunity for interested and dedicated students to expand their horizons and to gain practical insight into the work and daily life of a scientist. This allows young scientists like us to establish contact with other students, professors or supporting companies worldwide.

An important aspect of the competition is, that the teams work autonomously on a self-determined issue. In addition to the successful implementation of the project, the focus is also on *Human Practices*. In that regard, possible application fields of genetically engineering and their effects on the environment considering, among other things, sustainability will be discussed. Media such as newspaper, television, social media and radio will be used for this purpose.

The huge finale in Paris, named "Giant Jamboree", is the last stage of the competition, where all the teams come together to present their results.

To find out more about the iGEM Competition visit: <http://igem.org/Competition>



TEAM

03

creativity combined with smart thinking and team spirit

Our team combines everyone's individual strength, interest and experience to create a great working atmosphere and team spirit.

We formed our team, consisting of nine students from the biology department of the Technical University of Kaiserslautern, at the end of 2020. We are the third iGEM Team of the TU Kaiserslautern.

Our team is supported by five academic instructors of the departments of Biotechnology, Microbiology, Comparative Biochemistry and Molecular Genetics.



Prof. Dr. Schroda / Professor of Molecular Biotechnology and Systems Biology

Prof. Dr. Deponte / Professor of Biochemistry

Jun. Prof. Willmund / Junior Professor of Molecular Genetics of Eukaryotes

Prof. Dr. Frankenberg-Dinkel / Professor of Microbiology

Priv. -Doz. Dr. Erkel

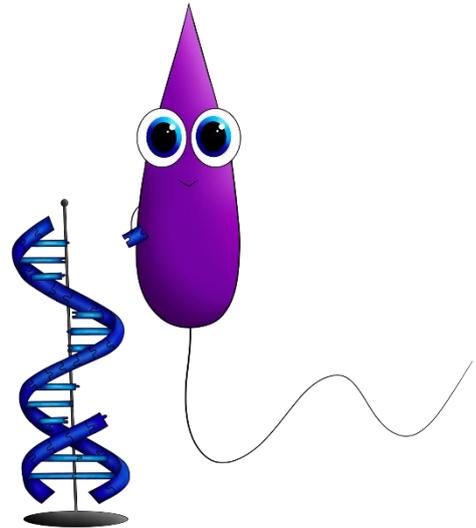
Genetic engineering is an increasingly important tool in our society. There are more and more development into pharmaceutical and medical methods every year. We want to contribute to their development by expanding the available organisms in this area of research.

Our vision of the future is one where people are more open to genetic engineering because of its instrumental uses in medicine, pharmacy and biology, and come to a better and more comprehensive understanding of its benefits for the world.

Not every organism is suitable for the expression of proteins in an industrial scale. The research and optimization of suitable expression systems is essential for rapid and inexpensive production of large quantities of a wide variety of proteins. The effective and at the same time inexpensive production of a wide variety of proteins offers many advantages not only for the producer, but also for the consumer, to whom the price reductions will be passed on. Especially through affordability, it enables more people to benefit from the advantages of modern biotechnology.



In order to biotechnologically efficiently produce biological substances for pharmaceutical applications, the selection of a suitable organism is crucial. A promising candidate for the production of such biomolecules is the unicellular organism *Leishmania tarentolae*. This combines the advantages of unicellular organisms with those of multicellular organisms. Due to its unicellular character it has a short generation time and is easy to culture, at the same time



it makes several human-like post-translational protein modifications that are important for pharmaceutical applications. Common bacterial expression systems, such as *E. coli* are therefore not suitable for pharmaceutical application in humans. However, this expression system is also suitable beyond human application because the protein modifications are stability-promoting, which is advantageous in any application. Furthermore, this organism does not require any special cell biology or safety equipment and is as easily manageable as *E. coli*.

The lack of efficient methods for utilizing *L. tarentolae* has made it poorly accessible for synthetic biology applications. However, with our project we want to make this organism easily applicable for a variety of purposes in science as well as in industry. By establishing the widely used modern modular cloning (MoClo) system for this organism, we aim to enable others to use it as we lower the obstacles.

MoClo will act as a kind of a puzzle here. To synthetically produce a protein, we need different sequences (pieces of a puzzle). With MoClo, we can put those pieces together in one single reaction, one which normally would need several different steps. This is possible because with MoClo our parts can only fit together in one correct way, which allows us to assemble all pieces in one step and very efficient in time.

This system thus makes it possible on a modular basis to assemble and finally express the desired genes quickly and efficiently. The "puzzle pieces" used here always have the same structure according to their function and are therefore standardized. This standardization is one of the enormous advantages of the MoClo system. Not only does it make it possible to exchange these pieces between projects, but also the pieces of other workgroups/labs can be exchanged and integrated into individual projects. Thus, all MoClo parts that we create in the course of our project for *L. tarentolae* can be used by everyone in any kind of project.

By establishing this method for Leishmania, we aim to enable others to use this versatile organism to produce, for example, human-like proteins much more efficiently with a lot less effort. Thus, proteins can be generated cost-efficiently in large quantities.

2020 – Microdestruction

Last year, the iGEM Team TU Kaiserslautern won the prize for the Best Environment Project (Overgraduate) by creating an environmentally friendly approach for eliminating micropollutants from water.

- **Best Environment Project** (Overgrad.)
- **Gold Medal**
- **Nominated for:**
 - **Best Basic Part** (Overgrad.)
 - **Best Presentation** (Overgrad.)

Abstract

Micropollutants are a massive concern in wastewater treatment, as their accumulation can seriously impact ecosystems. Anti-inflammatory medications such as Ibuprofen or Diclofenac are primary examples of micropollutants becoming an ever-growing problem through patient overuse and relaxed disposal practices. Laccase has been shown to chemically deactivate Diclofenac, leading to functional degradation. Different laccase genes (MarLac, from uncultivated marine bacteria, and BaLac, from a mutant *Botrytis aclada*) were cloned into both our control bacterium, *Escherichia coli*, and primary organism, the green algae *Chlamydomonas reinhardtii*. Produced laccases would be incorporated into a bioreactor set up. Our project will use synthetic biology in an innovative and cost-effective way to produce a self-sufficient system. We want to reduce the need for specialized and still experimental equipment with easy integration into existing sewage treatment plant systems. It is our vision to create a cost-effective and efficient approaches to a cleaner and healthier environment.

Visit their page for more information:

https://2020.igem.org/Team:TU_Kaiserslautern

2019 – Chlamy Yummy

The first iGEM team of the TU Kaiserslautern was awarded Second Runner-Up by establishing the green algae *Chlamydomonas reinhardtii* for recycling the commonly used plastic PET. By breaking down PET into its basic building blocks, a circular economy can be established.

- **Second Runner-Up** (Undergrad.)
- **Best Environment Project** (Undergrad.)
- **Best Plant Synthetic Biology** (Undergrad.)
- **Best Wiki** (Undergrad.)
- **Best Poster** (Undergrad.)
- **Gold Medal**
- **Nominated for:**
 - **Best Presentation** (Undergrad.)



Abstract

Plastic pollution is threatening life in all environment niches on this planet. We are taking action to save our planet by developing a biological recycling method for PET, a major plastic component. By inserting the genes for PETase and MHETase into the green algae, *C. reinhardtii*, we enable the degradation of PET into its monomers. These will be purified and used for resynthesizing PET. Our Bio-enzymatic environmentally friendly recycling method has a lower energy consumption in contrast to conventional recycling methods that rely on high pressure and temperature. Our approach allows the resynthesis of virgin PET, thereby maintaining the quality of newly synthesized plastics, while eliminating the need for new PET synthesis. We aim for our recycling system to become established in waste management and water treatment centers worldwide. Our Vision is to eliminate pollution of our environment with macro- and microplastic by developing a closed circle economy for PET!

Visit their page for more information:

https://2019.igem.org/Team:TU_Kaiserslautern

- New contacts
- Sustainability goals
- Presentation
- Connection to TU KL

We can only realize our idea with your help. Great partnership with strong and reliable partners from industry form the base of a successful competition. By supporting our iGEM team you not only pave the way for bringing our vision to life and enhancing our abilities, but it also allows you to introduce your company to the public and to the iGEM community from all over the world.

New contacts

With over 300 Teams iGEM is the biggest international competition in the field of synthetic biology and is growing quickly, you can reach a wide range of students from different courses of studies. During the iGEM competition, there are plenty of opportunities, in form of meetups, where your company is presented at a national and international level. To implement their great idea, some teams set up their own start-up company after successfully concluding iGEM.

This is your chance to form valuable connections and evaluate possible start-up opportunities in your field of expertise.

To find out more about start-ups at iGEM visit: <http://igem.org/Startups>

Your company towards a more sustainable future

As our sponsor, you can present your company's ambitions to support ambitious young scientists. All our sponsors will be uniquely visible in all our social media channels, regardless of whether support is provided in form of financial, material or ideal assistance. Through the international iGEM community, your company is also showcased to a large group of scientists and students.

Presentation

One of our main topics is the public presentation of our project. It is important for us to raise better understanding of biotechnology and to discuss advantages as well as the risks of genetical engineering. Therefore, we have a lot of events ahead of us to get in contact with the general public. By supporting us we can tackle this goal together. Your company can be showcased at every event we organize. For our main sponsors, we would like to introduce them to a final event at our university right after the "Giant Jamboree" in Paris.

Form bonds with students from the TU KL

The best audience to present a company is young talented people. Our university is the best place to attract smart and ambitious prospective professionals as further employees. You can form closer bonds with the Technical University of Kaiserslautern where every year well educated and dedicated students enter the industry. So make sure that they will remember you by sponsoring our team!

As our sponsor, we offer you special conditions.

You can choose between these options:



Platinum	EUR > 5000	<ul style="list-style-type: none">• Visit in your company, documented for social media• Mentioning in newspaper / interview / radio / Podcast• Own page on our website+ all previous rewards
Gold	EUR 1000 – 5000	<ul style="list-style-type: none">• Your logo on our posters• Your logo on our flyers+ all previous rewards
Silver	EUR 500 – 1000	<ul style="list-style-type: none">• Your logo on our info-point at public events• Your Logo on our team-clothes+ all previous rewards
Bronze	EUR ≤ 500	<ul style="list-style-type: none">• Posts on social media channels• Your logo on our homepage

These amounts are not necessarily monetary payments, in-kind payments are accepted as well. Please note that for all in-kind payments, only half the product value will be used to determine the sponsoring category. Thus, for example you are only considered a silver sponsor if the value of the contribution in kind exceeds 1.000€. Donations are of course also possible. We can issue a contribution receipt for any monetary payment.

We are looking forward to working hand-in-hand with your company, appearing in public relations together and creating a seminal project with your help.

To tie closer bonds, we would love to host you in our laboratory and to get to know you during a personal meeting!

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