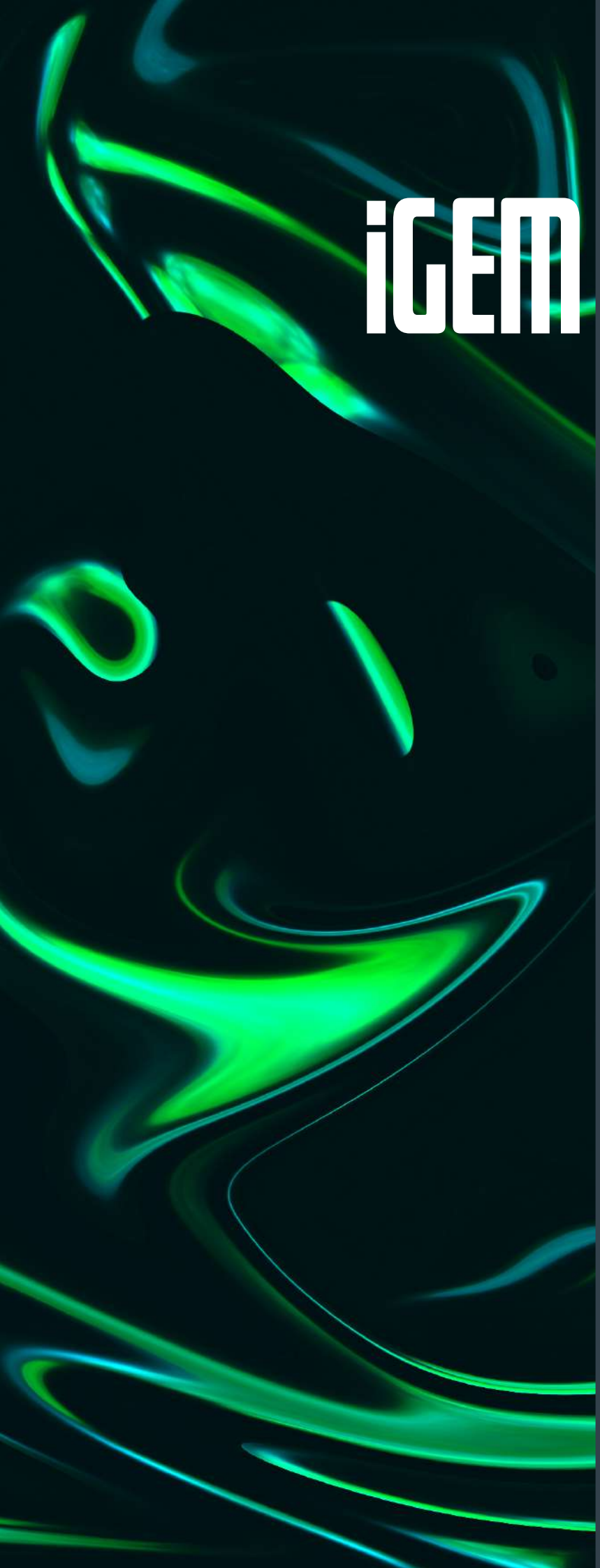

iGEM TÜBINGEN

A competition aiming
to inspire the
development of
innovative
and intelligent
solutions
in the field of
synthetic biology

Content

Prof. Dr. Dr. h.c. Detlef Weigel

Director at the Max Planck Institute for Developmental Biology

The major problems of our time - be they the inevitable global warming, the environmental pollution caused by the extraction of raw materials or the scarcity of agricultural land - urgently require inventive and effective solutions. This is the only way to ensure a dignified life for all people on earth, even if the world's population continues to grow.

iotechnology, in particular Synthetic Biology, offers a multitude of effective solutions that have become an integral part of our lives. Just two examples are the production of human insulin in E. coli and yeasts and recombinantly produced enzymes that can be used to effectively clean laundry even at low temperatures.

As director of the Max Planck Institute for Developmental Biology, I am particularly pleased about the highly motivated, creative young minds who are committed to tackling current problems that affect us all. The iGEM competition not only offers an opportunity to gain important practical experience, but also contributes to the international exchange of young researchers and each year produces a multitude of innovations and suggestions for improvement. That is why I am very happy to support the iGEM team in Tübingen. The Tübingen interdisciplinary team has excellent chances of successfully completing its original project. I wish the team a successful year, a lot of stamina and many new insights.

The international Genetically Engineered Machine (iGEM) competition offers a unique opportunity for students to translate their knowledge from class to a real world problem in an applied fashion. The iGEM competition provides the students with invaluable experience in soft skills, such as project management, team communication, public outreach, along with the chance to work at the lab-bench early in their undergraduate studies. The project is self-chosen by the iGEM team which clearly motivates the students to put all their efforts into the successful realization of their ideas. This has so far paved the way for the iGEM team Tübingen to bring home several Medals and Awards from the iGEM competition in the past years.

In the aftermath of the iGEM competition, past participants have built on the ideas they pursued with their iGEM teams and turned them into scientific publications or even start-up companies, and more generally embarked on successful careers in academia as well as industry.

In recent years, the field of synthetic biology is getting a lot of public attention and is increasingly moving into the limelight of the media. With game-changing technologies, such as CRISPR/Cas, it is important to support highly motivated students in their desire to use these technologies to change the world for the better, and to guide students to participate in an evidence-based but controversial discussion about the benefits and risks of these technologies. This year, the iGEM team Tübingen devised a project around the CRISPR/Cas technology. The team will design, build, and test an innovative microbial chassis as a concept for increased biological safety when handling genetically modified organisms.

With your support you can contribute to the success of this year's iGEM team Tübingen to once again represent not only the University of Tübingen but the entire region at outreach events, in the media, and last but not least at the influential concluding conference (Giant Jamboree) at the Massachusetts Institute of Technology in Boston, USA.

Dr. Bastian Molitor

Junior group leader Environmental Biotechnology Group University of Tübingen and mentor of the iGEM Team Tübingen 2019

What is iGEM

iGEM (International Genetically Engineered Machine) is an international competition in the field of synthetic biology, which was initiated by the Massachusetts Institute of Technology (MIT) in Boston. The competition aims to inspire the development of innovative and intelligent solutions for relevant and recent problems through genetic modifications. By participating in the iGEM competition, our team will be able to utilize the theoretical background attained during our studies in an interdisciplinary and self-reliant manner. Often, the projects initiated through iGEM are published or lead to the foundation of Start-ups.

For the duration of the competition, the iGEM team Tübingen will represent the Eberhard-Karls-University of Tübingen, as well as the faculty of mathematics and natural sciences on multiple occasions, such as conferences on an international level, within and outside of Europe. We will also be able to engage ourselves within the society through public events and discussion rounds. The iGEM competition will close with a congress, the Giant Jamboree, which annually brings thousands of contestants to Boston.

The iGEM team Tübingen itself participates since 2011, successfully representing the Eberhard-Karls-University of Tübingen, Baden-Württemberg and Germany.

2019-2020

Giant Jamboree

Traveling to Boston to present our project at the Giant Jamboree. Meeting all the other teams and finishing the intensive but awesome year.

Start of the Team

Formation of a new interdisciplinary iGEM-Team with diverse expertise. Finding supervisors, PIs, lab rooms...Teambuilding.

Did you Know ?
The founder of Ginko also was a former iGEM member and won the grand prize

Did you Know ?
In 2018 over 300 teams from around the world participated at the iGEM competition

iGEM

Preparation for Boston and project revision:

Collect and compile results, development of the project and the team, evaluate future steps and possibilities. Prepare for the completion of the year and the final presentation at the Giant Jamboree in Boston.

Projectfinding & Fundraising

Finding a promising topic to work on for the rest of the year. Start fundraising, networking and public presentation.

Human Practices

Get in touch with other iGEM-Teams, authorities, researchers, companies and local communities to discuss and present our project.

Laboratory

Extensive time spent in the lab to complete our project with impactful results. Combination of wet and dry lab to overcome obstacles and to improve the experiments and results.

Who WE ARE

We, the iGEM-Team Tübingen 2019, are a group of 15 students of the fields of biochemistry, bioinformatics, biotechnology, chemistry, nanoscience and molecular medicine. With our diverse and interdisciplinary team we plan, this year again, to pursue an interesting and forward-looking research project. The expertise of our competent lab-team and the experience of the past years together with a high motivation and the support of research groups as well as companies will help us to fulfill our goal of a successful project. Of great importance for us is the safety of the genetically modified systems and their use in a clinical context.

With this year's project we do not only aim at winning one of the prices at the 'Giant Jamboree' in Boston but also strive for contributing to the progress and development in synthetic biology.

Instructors

Patrick Schweizer
Environmental Biotechnology PhD

Sarah Schulz
Environmental Biotechnology PhD

Dr. Pengfei Xia
Post doc. Env. Biotechnology

Faculty advisors

Dr. Bastian Molitor
Junior group leader

Prof. Dr. Largus Angenent
Encironmental Biotechnology

The Team

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Molecular Medicine B.Sc

Eva Kunzelmann
Biochemistry B.Sc

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Famke Bäuerle
Nano-Science M.Sc

Luzia Hamma
Cognitive Science B.Sc.

Carolin Schwitalla
Biochemistry B.Sc

Lina Widerspick
Molecular Medicine B.Sc

Past Projects

2013

Development of a **yeast-based sensor for progesterin**, a contaminator of wastewater, by activating the expression of luciferin, allowing quantitative spectrometric measurements

2014

Construction of the **T-ECO system** (Tuebingen erythrocyte converter to 0), which modifies the glycoproteins of erythrocytes responsible for the blood groups, in order to **change the cells to** the rarer **blood type 0.**

2015

Development of a **light-inducible expression system**, based on the dimerizing capabilities of the fluorescent protein Dronpa.

2016

Design of an **fructose processing lactobacilli** to be integrated in the microbiome of fructose intolerant people.

Production of a pipetting robot able to perform simple cloning experiments.

2017

Development of an **novel antibiotic** that only targets ß-lactam resistant pathogens while not affecting other bacteria resident in the body.

2018

Detoxification of Botulinum toxins by coupling it to different substances to be utilized for therapeutic strategies and specific neuronal targeting. Also, **homology modeling** algorythms, **Molecular dynamics** simulations and a **deimmunisation workflow.**

WHY YOU should support us

The iGEM team Tübingen is an independent research group of motivated students and is therefore responsible for the organisation and financing of the project. In order to realize a successful iGEM project and achieve our goals in this competition, we need the support of companies, institutions, associations and private individuals. Not only financial support, but also the provision of materials and resources help us.

iGEM offers each of us a unique and valuable training opportunity that is hard to find anywhere else. Not only are the practical skills deepened, expanded and improved within the framework of a large project, but it also gives the opportunity to expand one's knowledge and skills in other areas. This enables the participants to learn valuable skills in the areas of project organization, implementation, presentation, financing and public relations. These are also valuable skills for your later career, which make iGEM participants stand out from the crowd. Since iGEM is an international competition, new national and international contacts are established through cultural exchange.

iGEM's intensive experience gives students the opportunity to continue their education outside of their academic career and, by networking with professors, companies, researchers and former participants, it draws on a large pool of knowledge and experience.

The iGEM team Tübingen has always been able to successfully realize its goals and projects thanks to the support it has received in recent years. Through the iGEM team Tübingen, sponsors come into contact with capable and motivated young scientists and are associated with an innovative scientific project. In return for a sponsorship of our project, our sponsors have the opportunity to advertise and represent themselves in public, at presentations, on our website and in many social networks.

Social Media: Banner
Poster: Standard size representation
Portfolio: Standard size representation

Social Media: Banner
Poster: Standard size representation
Portfolio: Standard size representation
Press: Mention at interviews Print/Digital.

Social Media: Banner & Videos
Poster: Header
Portfolio: Representation on the front page
Press: Mention at interviews print/digital.
T-Shirts: Logo on the back
E-Mail: Header
More: Representation on standard - products

Sponsoring

One major part of an iGEM project is also its funding. The costs that arise during one year of intensive research on one's own topic are immense and have to be balanced. Below you find an exemplary list of the expenses of one iGEM project.

Cost plan

Laboratory costs	**Costs in €**
Laboratory equeipment	235
Laboratory Material	1.800
Bioinformatics	170
Travel- and other expenses	
Meetups	530
Participation fees	1000
Giant Jamboree (19 participants)	25.600
Fairs and fundraising	480
Marketing	520
Flights	3.600
Total costs	**34.295**

Sponsors 2017/2018

With the generous support our sponsors it was so far always possible for the iGEM-Team Tübingen to successfully take part in the iGEM competition. By financially supporting us and by providing us with materials our sponsors contributed to our success and enabled us to complete a professional research topic on our own and to receive an unique and outstanding training. Since we are a student organised team that is self-responsible for organisation, planning, funding and representation, a participation at iGEM would otherwise not have been possible for us. Despite paving the way for a promising project our supporters could also connect with highly motivated students and further had their share in the initiation of intercultural exchanges. We are immensely grateful for your support and help!

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