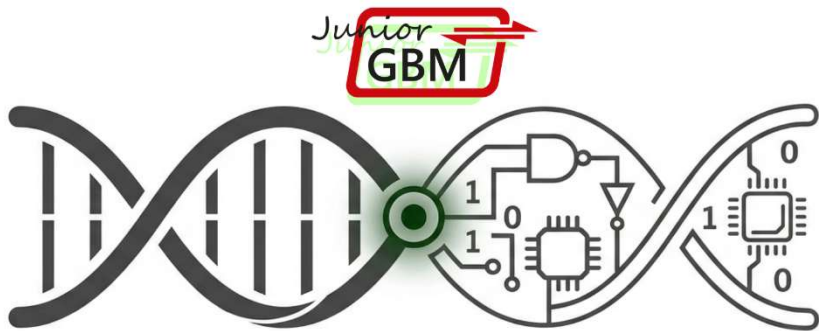


Marburg 19.-21.06.



Summer Symposium 2026

Synthetic Biology

Synthesize Tomorrow





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Welcome

Dear Friends and Colleagues,

It is our great pleasure to welcome you to the jGBM Summer Symposium 2026, organized by the Junior-GBM South West region and taking place from June 19th to June 21st in the vibrant city of Marburg.

This year's symposium is dedicated to the exciting and rapidly evolving field of synthetic biology. From metabolic engineering and protein design to synthetic genetics and innovative applications, the program will highlight the diverse ways in which biological systems can be engineered to address challenges in science, industry, and sustainability. Over the course of three days, you can look forward to inspiring keynote lectures, engaging scientific sessions, and interactive workshops. The symposium brings together students, early-career researchers, and professionals from academia and industry, providing a unique platform for scientific exchange, interdisciplinary collaboration, and networking.

Beyond the scientific program, we invite you to explore the historic city of Marburg, connect with fellow participants, and enjoy a welcoming and collaborative atmosphere. Whether you are presenting your work, seeking new ideas, or simply curious about the future of synthetic biology, this symposium offers an ideal environment to learn, discuss, and grow.

We are delighted to host you and hope that you will leave inspired, with new insights, connections, and perspectives.

Your organisation team of the junior-GBM Southwest

QR-Codes

This QR-code takes to our **website**:



This one takes you to our **WhatsApp group**:



Location

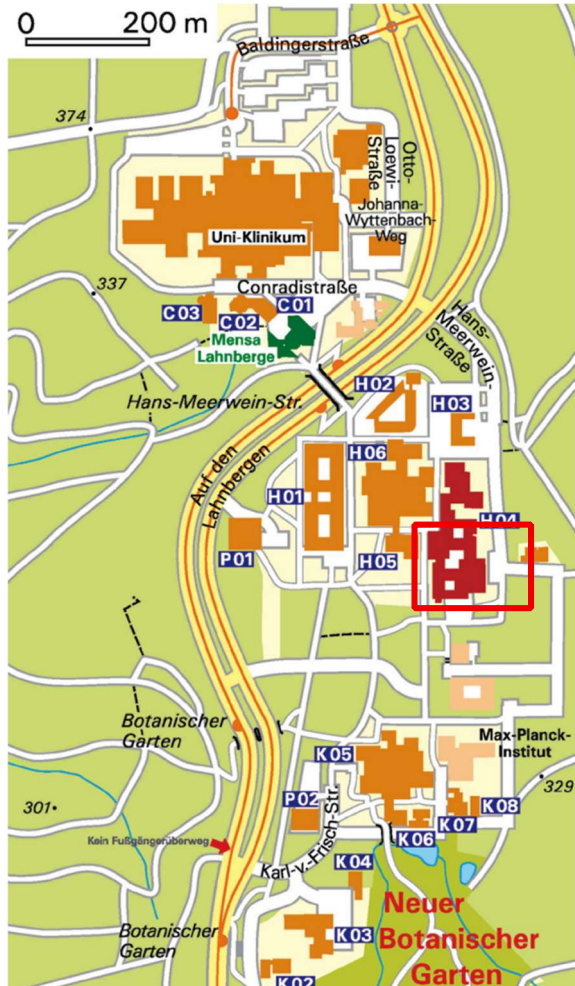
Marburg, nestled in the scenic Lahn valley, is one of Germany's most charming university towns. With its steep lanes, half-timbered houses, the Elisabethkirche, and the Landgrafenschloss overlooking the historic old town, it blends medieval character with a vibrant student atmosphere. The city is closely linked to the Brothers Grimm and is home to Philipps-Universität Marburg, founded in 1527 and the oldest Protestant university still in existence.

Marburg is also a renowned center for life sciences. Building on a strong tradition associated with Emil von Behring, the city is now internationally recognized for research in molecular and synthetic microbiology, particularly through SYNMIKRO and the Max Planck Institute for Terrestrial Microbiology.

The symposium will take place at SYNMIKRO on the Lahnberge science campus of Philipps-Universität Marburg (Karl-von-Frisch-Straße 14, 35043 Marburg). The campus is easily accessible by car and taxi, and well connected by public transport via the bus lines 2, 7, 9, 27, 75, and X35, which serve the Lahnberge/Hans-Meerwein-Straße area. Marburg itself is conveniently reachable by long-distance and regional trains (ICE and RE), making travel from across Germany straightforward.



Campus Lahnberge



SYNMIKRO



Friday June 19

16:00 - 17:30

Arrival & Registration

17:30 - 18:00

Welcome

18:00 - 19:00

Keynote lecture

Prof. Anke Becker

Engineering Life: Bacterial Chassis as Cornerstones of Synthetic
Biology

19:00 - open end

Get together and Dinner

Saturday June 20

08:30 - 09:30

Breakfast

09:30 - 11:30

Session 1: Metabolic Engineering & Protein Design

Dr. Maren Nattermann

(Re-)routing One-Carbon Molecules in Synthetic Pathways –
Working In- and Outside of Host Metabolism

Phillipp Elbers

Enzyme Design for a Sustainable Future

Prof. Daniel Schindler


Synthetic Genomics

11:30 - 12:15

AG Sustainability - Trash & Trivia

12:15 - 13:15

Lunch



13:15 - 15:15

Session 2: Applied Synthetic Biology

Dr. Ricarda Finnern

From University into Industry

Dr. Ulrich Betz

Future Insight

Prof. Dr. Tobias Erb

Synthetic Biology meets Machine Learning

15:30 - 17:00

Workshops

17:00 - open end

City tours and Dinner



Sunday June 21

08:30 - 09:30

Breakfast

09:30 - 11:30

Session 3: Synthetic Genetics

Prof. Barbara Di Ventura

Splice it into action! Inteins for controlling and probing biology

Dr. Leon Kraus

Synthetic RNA Biology

Prof. Viktor Stein

Combinatorial Protein Engineering in the Context
of the iFLinkC Framework

11:30 - 12:00

Closing remarks & Goodbye



Workshops

Building a Career in Synthetic Biology

Prof. Dr. Gert Bange

Ethical Questions: Chances and Risks of Synthetic Biology

Dr. Amelie Rüppel

Translation Sprint: From Research to Real-World Impact

MAFEX – Marburger Zentrum für
Entrepreneurship und Innovation

Keynote Speaker

Prof. Dr. Anke Becker

*Group Leader & Director at Max Planck Institute
for Terrestrial Microbiology, Marburg*



Engineering Life: Bacterial Chassis as Cornerstones of Synthetic Biology

Synthetic biology involves the engineering of biological systems for research, biotechnology, sustainability, and medicine. At the heart of this field are bacterial chassis - well-understood host organisms that provide reliable, versatile, and easily manipulated platforms for designing and testing biological functions. This lecture will introduce the fundamental concepts of synthetic biology and highlight why chassis bacteria have become indispensable tools to the field. Drawing on our recent research, current efforts to establish, optimize, and refactor synthetic biology chassis will be discussed, illustrating how these foundational model organisms drive both fundamental understanding and practical applications in synthetic biology and biotechnology.



Abstracts

Dr. Maren Nattermann

Group Leader at Max Planck Institute for Terrestrial Microbiology, Marburg



(Re) routing one-carbon molecules in synthetic pathways – working in- and outside of host metabolism

Engineered microbes offer exciting new opportunities for the sustainable production of value-added chemicals from cheap feedstock. In contrast to traditional chemical synthesis, they do not require high temperatures, pressure, or toxic solvents. One-carbon substrates, such as carbon dioxide, formate and methanol, are prime candidates for sustainable substrates. However, they provide little to no energy to the cell, demanding highly efficient assimilation pathways.

To mirror this efficiency in synthetic one-carbon assimilation, pathways must be compatible with host metabolism. They cannot deplete key metabolic intermediates, or disrupt the cellular energy balance. Here, we discuss two strategies of implementing a formate reduction module in *E. coli* – growth-coupling, forcing adaptation to host metabolism by applying evolutionary pressure, and orthogonality, producing value-added compounds directly from formate without any integration into core metabolism.

Prof. Dr. Daniel Schindler

*Center of Molecular Biology, Ruprecht Karls
Universität Heidelberg*

Synthetic yeast and synthetic biology approaches to utilise biopolymers from waste streams



Despite being more than 25 years old, synthetic biology is often referred to as an emerging field and is described as seeing biology from the engineer's perspective. Rapid technological advances in synthetic biology more recently have enabled researchers to design, synthesise and use synthetic chromosomes and genomes, giving rise to the field of synthetic genomics. An exceptional international consortium has synthesised all sixteen yeast chromosomes according to a set of dedicated design rules. The finalised chromosomes have been available since 2025 and are currently being consolidated into a single strain.

This presentation provides insights into the Sc2.0 project and explains how synthetic yeast strains can be used alongside other synthetic biology approaches to create a more holistic approach to the circular bioeconomy.

Philipp Elbers

*Max Planck Institute for Terrestrial Microbiology,
Marburg*

Enzyme Design for a Sustainable Future

Nature has spent billions of years evolving the biochemical processes that sustain life. At the core of these processes are enzymes—molecular machines of remarkable precision and efficiency.

However, evolution optimized enzymes for survival, not for biotechnological applications. Computational protein design provides a route to construct these molecular machines from scratch for specific purposes beyond the constraints of natural evolution.

In the Bunzel group, we design photoenzymes for sustainable solar energy conversion, for example, to convert sunlight into electricity in biological solar cells. Using computational design, we introduced photosensitizer binding pockets into existing proteins. The resulting photoactive complexes were subsequently improved by directed evolution over five rounds of mutagenesis and screening. The final photoenzyme produces 5.0-fold higher photocurrents than the photosensitizer alone. Building on this foundation, we further leverage protein design to assemble these enzymes into highly structured nanoscale architectures, enhancing system performance beyond what single enzymes can achieve. Ultimately, our work provides an avenue towards sustainable photoenzymes for solar energy conversion and enhances our computational design abilities to address global sustainability challenges.



Dr. Ricarda Finnern

CEO DiaphOne Therapeutics

From University to Industry

Synthetic biology is redefining what it means to be a scientist: no longer only discovering knowledge, but actively shaping solutions for global challenges.



I will outline a practical journey from university research to start-up creation, showing how ideas can evolve into real-world applications that address industrial and societal needs. Along the way, key elements such as intellectual property, funding, product development, and market understanding are reframed as tools for amplifying impact rather than barriers to entry.

The session also explores how technologies like artificial intelligence can accelerate this transition, and why communication, visibility, and storytelling are essential in today's innovation landscape.

Entrepreneurship is not an alternative to science, but its natural extension.



Dr. Ulrich Betz

Senior Vice President Innovations at Merck

Future Insight

Merck is a vibrant science & technology company with business in healthcare, life science and electronic materials and a history that goes back to 1668.



Open innovation is part of our DNA and we are inviting researchers from all over the world to work with us making great things happen. Merck is also a member in the Future Insight association which unites visionary individuals and organizations in a shared mission: to advance science and education for the benefit of humanity.

Future Insight e.V. is an open alliance illuminating tomorrow by integrating scientific insight with inspirational wisdom and timeless virtues to shape a bright and peaceful future for everybody.



Prof. Dr. Tobias Erb

*Max Planck Institute for Terrestrial Microbiology,
Marburg*

Synthetic Biology meets Machine Learning



Prof. Barbara Di Ventura

*Centre for Biological Signaling Studies,
University of Freiburg*

Splice it into action! Inteins for controlling and probing biology

Inteins are unusual proteins that perform a self-catalyzed protein splicing reaction. They have become valuable tools in synthetic and cell biology. In this talk, I will introduce the basic principles of intein function and present recent work from my lab on exploiting inteins and engineering light-controlled intein activity.



Prof. Dr. Viktor Stein

*Centre for Synthetic Biology, Technical
University Darmstadt*

Combinatorial Protein Engineering in the Context of the iLinkC Framework

The iterative functional linker cloning (iLinkC) framework provides a scalable, rule-based DNA assembly framework for constructing complex fusion proteins in a hierarchical and combinatorial fashion. iLinkC has proven especially powerful in the context of combinatorial linker engineering which is turning out key in the construction of many high-performing protein switches and sensors. Successful examples include synthetic protease switches, bioluminescent and fluorescent protein sensors as well as recombinant nanopore assemblies. Finally, iLinkC can be readily automated on a robotic platform.



Dr. Leon Kraus

Technical University Darmstadt

Synthetic RNA Biology

RNA devices such as riboswitches, ribozymes, and biosensors have become essential tools in synthetic and molecular biology, leveraging RNA's structural diversity and modularity to create programmable systems for sensing, gene regulation, and beyond. Aptamers, which bind targets with high affinity and specificity, are central to these technologies.



However, the selection of conformational-switching aptamers that are capable of driving these devices remains a challenge using traditional methods. We address this by developing integrated protocols for aptamer selection and engineering versatile devices from structure-switching RNAs. This has yielded multiple functional sequences, including a tobramycin aptamer that functions as a translation-regulating riboswitch, repressing gene expression by up to 18-fold.

A levofloxacin aptamer enabled a lateral flow assay platform that detects analytes via released capture oligonucleotides - a mechanism distinct from traditional direct-binding approaches. Finally, we engineered a new caffeine aptamer into functional hammerhead aptazymes in both yeast and mammalian cells via optofluidic screening. Integration with the iSpinach fluorogenic aptamer yielded a caffeine-responsive biosensor. These protocols expand the toolkit for RNA-based devices and open new avenues for diagnostics and synthetic biology applications.



AG Sustainability

Look forward to an interactive **Pub Quiz** on sustainability in the lab life.

Furthermore, this year's **winners** of the waste collection challenge will be awarded.

Waste Collection Challenge 2026



When? May of 2026

Where? In and around your cities.

Why?

- + Group experience
- + Sustainability
- + Cleaner City

Prizes! Award ceremony at the summer symposium and great prizes for the most active group!

How to participate:

1. Collect as many bags full of waste as possible with your city group!
2. Post and share pictures of your waste picking adventures online.

#one2pick jgbm_nachhaltigkeit



Abstract workshop 1

Building a Career in Synthetic Biology

Prof. Dr. Gert Bange

The workshop “Career Paths in Synthetic Biology” provides insights into professional opportunities at the interface of molecular biology, engineering, and biotechnology. Participants will learn about different career paths, relevant skills, and current developments in the field of synthetic biology. The workshop also offers space for questions and discussion about entry points and career development in this interdisciplinary field.



Abstract workshop 2

Ethical Questions: Chances and Risks of Synthetic Biology

Dr. Amelie Rüppel

What does “synthetic” mean? How does the synthetic relate to what we commonly call the natural? And why is this distinction significant for understanding ethical debates surrounding synthetic biology? This workshop aims, on the one hand, to shed light on ethical arguments grounded in different conceptions of nature, which often frame public debates on synthetic biology. On the other hand, it proposes a more pragmatic and concrete approach to the ethics of synthetic biology by introducing a gradual model for the ethical evaluation of research and practices in the field.



Abstract workshop 3

Translation Sprint: From Research to Real-World Impact

MAFEX – Marburger Zentrum für Entrepreneurship und Innovation

In this interactive 90-minute design dash, participants will transform scientific research ideas into first translational concepts by identifying relevant stakeholders, defining real-world problems, exploring solution pathways, and mapping key resources and partners.

Using the DeepTech Translation Canvas methodology, teams collaboratively develop a first impact and translation roadmap from lab to application.

Participants may work either on their own research ideas or on real-world DeepTech and Life Science cases inspired by successful scientific spin-offs.

Get together events on Saturday



Explore the beautiful city of Marburg guided by our best (available) Marburg experts (from our city group)



Visit Marburg Castle (it's worth the climb)



Paddle on the river Lahn, relax on its picturesque shore (frisbee and card players welcome)



Visit the Street Food & Music Festival



Want to learn more about the (junior-) GBM?

Check out our junior-GBM Website:



How to join the GBM:















GBM member perks include:

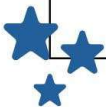
- Free Biospektrum magazine 7x/year
- Travel allowance for the Mosbacher Kolloquium
- Be part of a huge network of biochemists throughout Germany



Bingo



<p>_____</p> <p>has lived abroad for more than 6 months</p>	 <p>_____</p> <p>is scared of spiders</p>	<p>_____</p> <p>can play the piano</p> 	 <p>_____</p> <p>has a cool piece of science-related clothing</p> 
 <p>_____</p> <p>has once broken sth. very expensive in the lab</p>	<p>_____</p> <p>has travelled more than 200 km to join the symposium</p>	<p>_____</p> <p>has completed a (half)marathon</p> 	<p>_____</p> <p>lives in NRW</p> 
<p>_____</p> <p>has an unusual hobby</p> 	<p>_____</p> <p>is afraid of public speaking</p>	<p>_____</p> <p>is lefthanded</p> 	<p>_____</p> <p>has received praise from a PI</p>
<p>_____</p> <p>has met someone famous</p> 	<p>_____</p> <p>has once forgotten to put a balance in the centrifuge</p>	<p>_____</p> <p>has had a Rostiger Nagel</p> 	<p>_____</p> <p>can do a handstand</p> 



Thanks to our Sponsors and Collaborators!



CSL Behring

