Photosynthetic organisms can help us transition to a sustainable economy and as a dedicated researcher with a strong practical and theoretical background, I am well equipped to work towards making this a reality. Through my time at Europe's flagship laboratory for the life sciences (EMBL) and my theses I have honed my skills in genetically engineering *E. coli* as well as algae and cyanobacteria. My time competing in the scientific contest iGEM meanwhile, has helped me develop an eye for detail and an ability to function both independently and in an interdisciplinary team. These skills combined with a strong work ethic and a passion for sustainability would make me an excellent candidate to help analyze whether and how phototrophic microorganisms can power our society.

Professional Experience

2017–present *European Molecular Biology Laboratory (EMBL)*, Rome, Italy

Job Title **Technical Officer**, *Genetic and Viral Engineering Facility*

Achievements
- Used oligo recombineering, *in vivo* fragment joining and deletion, classical and Gibson cloning to produce high-quality genetic constructs in *E. coli*
- Implemented new protocols to produce and quantify viral vector tools (AAV and lentivirus) in an aseptic environment
- Automated calculations for experimental procedures using FileMaker database and Microsoft Excel
- Improved FileMaker database and accurately managed sample data
- Ensured functional laboratory (monitored lab supply, equipment and instruments, prepared stock solutions and media)

Research Experience

M.Sc. Thesis — Genetics & Experimental Bioinformatics

Topic *Biochemical analysis of the Cas6-1 RNA endonuclease associated with the subtype I-D CRISPR-Cas system in Synechocystis sp. PCC 6803.* [2]

Motivation Explore applicability of endogenous Synechocystis CRISPR/Cas system in metabolic engineering

Achievements
- Further characterized one of the Synechocystis crRNA maturation enzymes by generating mutant strains via homologous recombination and conjugating them with plasmid DNA
- Analyzed cleavage capability of protein mutants *in vitro* and in culture
- Assembled all genetic constructs in *E. coli* using Gibson and *in vivo* cloning

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iGEM Competition

Topic — *Multiplexed antibody detection from blood sera by immobilization of in vitro expressed antigens and label-free readout via imaging reflectometric interferometry (iRIf). [1] (Team Website)*

Motivation — Allow for a cheap and quick pre-test that screens for multiple diseases

Achievements
- Developed a prototype for multiplexed, microfluidics-based, label-free diagnostic tool
- Contributed to *interlab study [3]*
- Provided overexpressed and purified proteins from *E. coli* for initial tests
- Accurately recorded and communicated results comprehensively for all team members, to a crowdfunding community and to a jury at the final international conference at MIT
- Taught myself adobe illustrator and designed most of the explanatory illustrations for the *website*
- Successfully organized ourselves as an interdisciplinary team to ensure availability of sufficient funding and reagents and a functional lab
- Analyzed literature to find a commonly agreed on, high-impact project

Awards — Gold medal; nominated for Best Health and Medicine Project, Best Innovation in Medicine and Best Wiki.

B.Sc. Thesis — Cell Biology

Topic — *Nannochloropsis oceanica as an expression system for recombinant proteins and studies on protein transport across the periplastidal membrane of Phaeodactylum tricornutum.*

Motivation — Enlarge molecular toolbox for *P. tricornutum* and explore *N. oceanica* as expression platform for recombinant antibodies

Achievements
- Expressed recombinant single-chain antibody in *P. tricornutum* to study intracellular protein transport
- Assembled genetic constructs in *E. coli* using restriction enzyme based cloning methods

Education

2014–2016 **M.Sc. Biology**, *Albert-Ludwigs-Universität Freiburg*, Germany, *GPA 4.0*.

2011–2014 **B.Sc. Biology**, *Philipps-Universität Marburg*, Germany, *GPA 4.0*.

Languages

German: *Native* **English:** *Fluent* **Italian:** *Fluent*

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Computer Skills

Office	Microsoft Excel, Word, PowerPoint	*very proficient*
Biology	Geneious, SnapGene	*very proficient*
Other	Adobe Illustrator, FileMaker database, LaTeX, GitKraken	*basic*

Publications

[1] Bender J. et al. "Multiplexed antibody detection from blood sera by immobilization of in vitro expressed antigens and label-free readout via imaging reflectometric interferometry (iRIf)." In: *Biosensors and Bioelectronics* (2018).

[2] Jesser R. et al. "Biochemical analysis of the Cas6-1 RNA endonuclease associated with the subtype I-D CRISPR-Cas system in Synechocystis sp. PCC 6803". In: *RNA Biology* (2018).

[3] Beal J. et al. "Reproducibility of Fluorescent Expression from Engineered Biological Constructs in E. coli." In: *PLoS One* (2016). Contributor.

References

EMBL **Dr. James Sawitzke:** *Head of Genetic and Viral Engineering Facility, EMBL Rome — Italy* james.sawitzke@embl.it +39 06 90091 268 https://www.embl.it/services/genetic-and-viral-engineering-facility/index.html

M.Sc. Thesis **Dr. Wolfgang Hess:** *Professor for Genetics & Experimental Bioinformatics, University Freiburg — Germany* wolfgang.hess@biologie.uni-freiburg.de +49 761 203-2796 http://www.cyanolab.de/

iGem **Dr. Maximilian Ulbrich:** *Group leader at Centre for Biological Signalling Studies (BIOSS), University Freiburg — Germany* max.ulbrich@bioss.uni-freiburg.de +49 761 203 97183 http://www.ulbrich-lab.com/

iGem **Dr. Nicole Gensch:** *Laboratory manager of the Toolbox, BIOSS, University Freiburg — Germany* nicole.gensch@bioss.uni-freiburg.de +49 761 203 97225 http://www.bioss.uni-freiburg.de/de/toolbox/toolbox-home/