

Adapting Methane with Yeast - Calvin Henard

1. *Methylobacterium alcaliphilum* 20ZR as platform for production of fuels and value-added chemicals
2. Model biochemical pathways
3. Uses expertise in molecular biology and microbial genetics to develop algal, yeast, and bacterial biocatalyst for conversion of renewable substrates to biofuels and bioproducts
4. Methane biocatalysis to fuels and chemicals
 - (a) Methanogenesis and anaerobic digestion of lignocellulosic biomass and waste streams
 - (b) Advanced genetic tool development for industrial microbes
 - (c) Isolation of environmental microbes with industrially promising characteristics
 - (d) The role of nitric oxide (NO) signaling in algal lipid accumulation

National Bioenergy Center
National Renewable Energy Laboratory
15013 Denver West Parkway, Golden, CO 80401

August 8, 2018

Dear Dr. Calvin Henard,

Having seen the destructive consequences of our overreliance on fossil fuels, I have an abiding desire to contribute towards the development of alternative fuels that would allow our society to prosper without detriment to the planet. NREL's National Bioenergy Center, with its dedication to finding sustainable, secure transportation systems, represents the perfect fit for my ambitions and passions. Likewise, having focused on organisms that could be used for the generation of biofuels or secondary metabolites, I believe my skills and background make me an excellent candidate for NREL.

During my bachelor thesis I gained insight into the cultivation of *Nannochloropsis oceanica* and *Phaeodactylum tricornutum* and during my master thesis I successfully cultivated and processed *Synechocystis* sp. PCC 6803 ([Publication](#)). These experiences have left me well prepared to work preparing and cultivating both algae and cyanobacteria. The wide array of lectures and courses I took in biochemistry, organic chemistry, molecular biology and microbiology has also left me with a solid foundation to learn and develop new procedures and protocols in the lab.

As part of a student competition called iGEM (international Genetically Engineered Machine), I learned how to work independently and cooperate with an interdisciplinary team of 20 students. To improve team coordination and communication I expanded my proficiency in handling Microsoft office suite and gene analysis softwares (Geneious, Snapgene) and learned how to set up and organize databases (FileMaker) and use an internal wiki for accurate and reliable data storage. Through iGEM and my theses I learned to clearly communicate results to my team and a wider audience using oral presentations and a [website](#). To further hone this skill I attended a professional course on proper presentation.

My current team at the European Molecular Biology Laboratory (EMBL) comprises **consists of** two

members, giving me ample experience in the basic organization and daily maintenance of running a lab. During my time here I have acquired a broad range of responsibilities and have learned to balance multiple projects while managing my time to keep ahead of deadlines. Within the first few months at EMBL my job description changed quite dramatically and I had to quickly learn techniques that were new to both my supervisor and me. Due to the reshaping I also started working in a BSL2 environment and am thus aware of the importance of stringently following safety guidelines and maintaining a safe working environment.

Besides the experience I collected in different laboratory environments over time, I bring excellent interpersonal, organizational and communication skills shaped by a range of volunteering activities. Given my skillset I believe I could make valuable contributions to NBC's team and it would be an honor to contribute to your research into algal biofuels. If you agree, I would appreciate the opportunity to discuss the position and my potential contributions in more detail. Thank you for your time and consideration, I look forward to hearing from you.

Sincerely,

Rabea Jesser

Note: M.Sc. Thesis, B.Sc., references and a more complete CV can also be sent upon request.