Sustainability, Energy and Environment Complex
4001 Discovery Drive, Boulder, CO 80303

August 26, 2018

Dear Dr. Gill,

With hands-on practice using recombination techniques aquired while working for James Sawitzke in the Genetic and Viral Engineering Facility of Europe's flagship laboratory for the life sciences (EMBL) in Rome, I am ready to engineer new strains in your lab. My understanding of CRISPR/Cas systems in general and the Synechocystis CRISPR/Cas system in particular enable me to come up with ways to couple CRISPR/Cas systems with recombineering to develop genetic tools for the production of renewable fuels or chemicals. The team spirit and interpersonal skills I developed during the iGEM (international Genetically Engineered Machine) competition, and the initiative and ability to adapt to new situations I have displayed while working for EMBL ensure that I can quickly transition to your lab and begin making contributions from day one.

For my M.Sc. thesis I explored the use of the endogenous CRISPR-Cas system of Synechocystis sp. PCC6803 in metabolic engineering by modifying the Cas proteins of one of its CRISPR loci via homologous recombination and providing an artificial crRNA via conjugation. I used Gibson Assembly and *in vivo* cloning to design and generate the genetic constructs, produced recombinant proteins in *E. coli*, extracted and analyzed RNA *in vitro* and from Synechocystis cultures and eventually *published* on the biochemical characterization of the Synechocystis crRNA maturation endonuclease Cas6-1. This experience prepared me to analyze, translate and reengineer the functionality of CRISPR/Cas systems for other purposes.

During my M.Sc. I participated in an interdisciplinary team of 20 students to develop a low-cost, multiplexed and label-free diagnostic tool in the iGEM competition. Within eight months of wet lab we produced high-value *data*, presenting our findings on our *website* and at iGEM's international conference at MIT, where we were awarded a Gold medal and nominated for Best Health and Medicine Project, Best Innovation in Medicine and Best Wiki. Throughout iGEM we successfully ran our own lab independently, including ordering reagents, communicating with companies and funding agencies, making and sterilizing media and keeping the lab and our data organized.

After my M.Sc. I began working for James Sawitzke in EMBL's Genetic Engineering Facility where I constructed various genetic constructs by recombining ssDNA or doing fragment joining on a plasmid or BAC. Soon after I started, the facility evolved into being the Genetic and Viral Engineering Facility, so I quickly adapted and engaged myself in implementing new protocols for the production and quantification of viral vector tools in mammalian cell culture. Initially our two person team only provided recombinant AAV, but as my skills progressed, our portfolio has expanded to include recombinant lentivirus and we are in the process of adding HSV. In addition to the laboratory work, I have taken the initiative to extend the facility's database and automate calculations for protocols using Excel and Filemaker, helping streamline the lab and more consistently produce and record valuable data. Furthermore, I am continually applying techniques I learned from a professional development course on project management for scientists across more than 12 projects to deliver high quality final products in a timely fashion to our partners.

Although EMBL offered extensive experience in the lab and provided room for growth, the research focus is simply not after my own heart and I would rather like to use my knowledge in recombineering and CRISPR/Cas systems towards developing microorganisms for the production of commodity chemicals and biofuels. If you agree, I would appreciate the opportunity to discuss any potential position and my

contributions in more detail. Thank you for your time and consideration, I look forward to hearing from you.

Sincerely,

Rabea Jesser