10 November 2019

Dear ███████████ and Selection Committee,

I am writing to express my intent to apply for the F99/K00 fellowship. I am a 4th year graduate student in the Jared Rutter lab in the Department of Biochemistry. My research interests revolve around developing and deploying computational and statistical algorithms and tools for understanding and contextualizing complex metabolic data. Since joining the Rutter lab, I have been a contributor to many publications in my lab. In particular, in one recent paper we described the metabolic landscape and outlined resulting key considerations that should be made when analyzing data within the metabolic network. Understanding this network will require large amounts of data. I developed a computational toolkit, called XPRESSyourself, to aid in processing and analysis of sequence data for this purpose. This project was recently published as a pre-print on *bioRxiv* and is undergoing peer review. Upon the foundations set by these projects, **I am developing a new computational tool, called Metaboverse, to visualize and analyze these networks**. A substantial portion of this project is in collaboration with Dr. Bei Wang in the School of Computing at the University of Utah to develop computational algorithms that will **automate the detection of regulatory events and infer mechanisms behind these events within the metabolic network**.

Understanding the interplay within these networks is key to understanding the roles and consequences of metabolism in cancer. Interestingly, two leaders in the field, Drs. Ralph DeBerardinis and Navdeep Chandel, recently published a review article regarding cancer metabolism where they note that one of the three primary bottlenecks to harnessing cancer metabolism for therapeutic avenues is **a current lack of analytical and computational methods for deconvoluting the metabolic cooperativity of metabolism**. I feel that with my unique dual training in laboratory and computational methodologies, I am positioned to address these shortcomings in cancer metabolism research. **Throughout my career, I plan to continually develop necessary tools for understanding the complex relationships within cancer metabolism**. My training in the Rutter lab will be consequential in developing the background necessary to achieve these goals. After I receive my Ph.D, I plan to pursue a post-doctoral position in a laboratory with expertise in network biology and machine learning to help me further develop the necessary skills as a computational biologist to ask and answer these questions. These steps will be consequential in my preparation to become a leader in computational metabolism and aid the field in obtaining a holistic, systematic understanding of metabolism and its role in tumorigenicity.

Sincerely,

Jordan A. Berg
Ph.D Candidate
Rutter Lab, University of Utah