

Ph.D. DISSERTATION DEFENSE

Allwin McDonald

Towards Practical Biocatalysis:
Characterization and Engineering of Synthetically Useful Enzymes

Buller Lab

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Enzymes are attractive catalysts for synthetic applications owing to their high chemo-, regio-, and stereoselectivity, mild reaction conditions, and biodegradability. However, the use of enzymes for synthesis (biocatalysis) is hampered by this same specificity, limiting overall utility. My Ph.D. work has focused on exploring and expanding biocatalyst substrate scopes. Using a broadly active tryptophan decarboxylase enzyme as a model system, I have developed methodology to facilitate protein engineering. In my defense, I will discuss the development of this protein engineering method, the application of this method to engineer enzymes for new activities, and the usage of the engineered enzymes to access medicinally relevant tryptamines and 1,2-amino alcohols.

