The use of algae as a feedstock in acetone, butanol, and ethanol (ABE) fermentation is a novel process that enhances the economic viability of ABE production and biodiesel production from algae. Unique strains of clostridia are capable of producing ABE by metabolizing sugars present in algae biomass. The solvents produced through ABE fermentation can provide a source of reliable renewable energy to lower dependence on fossil fuels. Butanol is an especially high value solvent because it can be used directly in current infrastructure, considered a drop-in fuel source.

Using residual algae feedstocks from post lipid extraction (for biodiesel production) is possible because the carbohydrates remaining in the residual algae after lipid extraction can be used to drive ABE production. This previously unused waste material is inexpensive compared with more common fermentation substrates such as glucose.

My research has resulted in a peer reviewed publication demonstrating that algae can be used to drive ABE fermentation. The objective of my current research is to further optimize ABE fermentation by discovering novel and physiologically distinct ABE producing microorganisms in the Logan City Wastewater Lagoon system. The production of ABE using renewable feedstocks such as algae could have significant implications in the production of domestic energy economies.