

Christine Marie Roche

Graduate Institution: University of California-Berkeley

Graduate Discipline: Chemical and Biomolecular Engineering

Hometown: Brecksville, OH

Relevant SC Research: Biological and Environmental Research



Research Interest:

Global climate change, increasing energy demands and limited availability of fossil energy resources are serious challenges facing society today. Second-generation biofuels, such as biodiesel, can offer sustainable and renewable alternatives to fossil fuels. The majority of biodiesel produced is derived from oilseed crops such as soybean. The acreage of oilseed crops that is required to displace a significant fraction of diesel is beyond current sustainable production capacity. Heterotrophic lipid production has the potential to overcome this limitation. Two major challenges limit the economic feasibility of biodiesel production from heterotrophically-produced lipids: (1) simple sugars are required as a feedstock and (2) lipid recovery is challenging. We propose to overcome these limitations using a cellulolytic filamentous fungus to produce and secrete lipids from a lignocellulosic feedstock. In our studies we use the filamentous fungus, *Neurospora crassa*, as a model for understanding and improving lignocellulose-derived lipid production, with ultimate goal of developing an approach for redesigning of any cellulolytic fungus to achieve maximal lipid production and secretion from lignocellulosic biomass.

About Me:

Between my undergraduate and graduate studies I worked for two years at the National Renewable Energy Laboratory as a Biochemical

Engineer in the Bioprocess Research and Development group. At NREL I focused on improving the enzymatic saccharification process of converting chemically pretreated lignocellulosic biomass to ethanol. To improve process economics, I worked on developing an enzymatic saccharification reactor system for high-solids biomass concentrations through the study of physical properties and rheology of biomass hydrolysis slurry. Though my tenure at NREL was enjoyable and rewarding, to enter into the research specialty and path that I desire I decided to return to graduate studies. In addition to pursuing a graduate degree at UC Berkeley, I am also a member of professional associations such as AIChE, SBE, ACS and SIMB. After concluding my graduate studies I would like to return to work at a national laboratory or, possibly, industry.

When I am not working in lab, I enjoy exercising, spending time outdoors, cooking and baking, or simply relaxing.



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