

Cal ACS Tour of the Advanced Biofuels and Bioproducts Process Development Unit (ABPDU-LBNL) in Emeryville

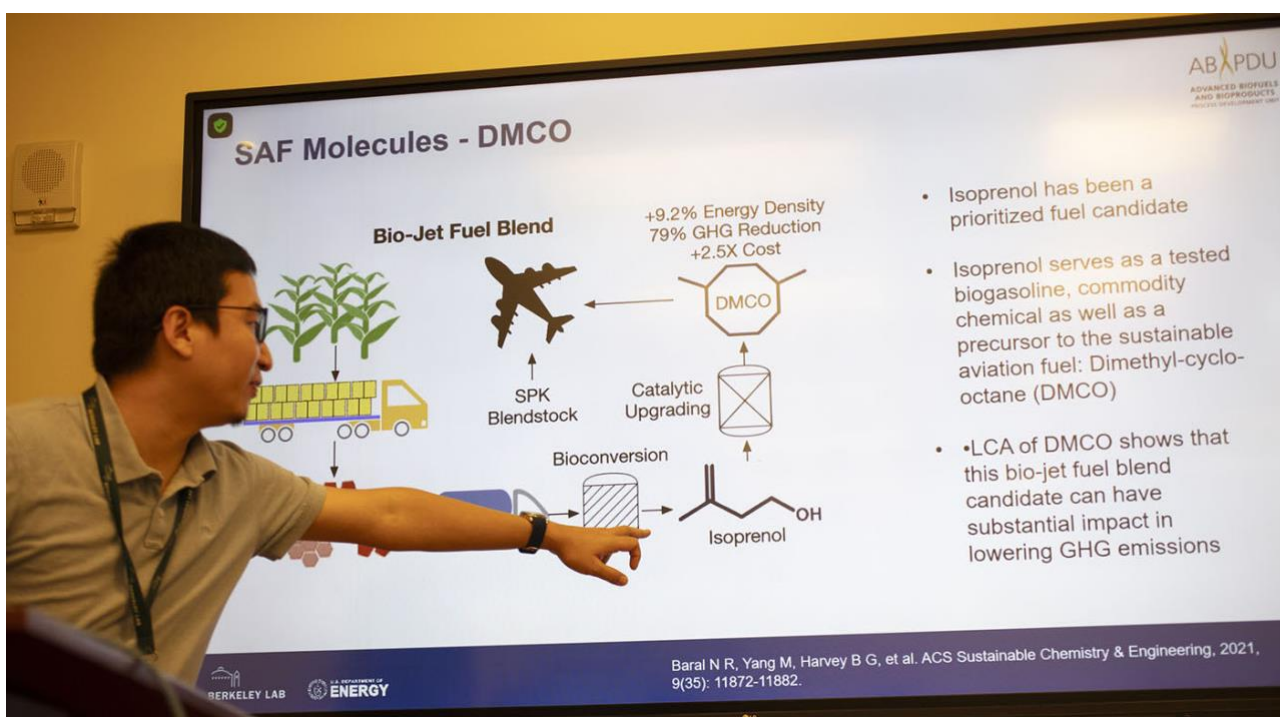
Cal ACS members and guests participated in a unique tour of LBNL's Advanced Biofuels and Bioproducts Process Development Unit ([ABPDU](#)) in Emeryville, CA on Thursday, May 14th, 2024. Two dozen of us met at Summer Summer Thai Eatery for networking, drinks and a delicious buffet dinner. Cal ACS Member-at-Large and ABPDU Senior Process Engineer Dupeng Liu joined us for dinner and then led us next door to the ABPDU facility. We paused for a group photo in the atrium, below a wall featuring the faces of several dozen Nobel laureates associated with the SF Bay Area.



At the ABPDU conference room, Dupeng introduced us to the laboratory's role in helping partners (both small and large businesses) demonstrate new processes for sustainable manufacturing of valuable chemicals. They have worked with over 75 different companies and participated in the successful commercialization of dozens of products.



Dupeng's work is focused on another ambitious project: SAF (Sustainable Jet Fuel) from biomass. Air travel accounts for about 3% of global carbon dioxide emissions, and electrification via batteries or fuel cells is not likely to succeed because of their weight. Corn stover can be broken down via fermentation to isoprenol, a key intermediate that can be catalytically converted into dimethylcyclooctane:



We divided into two groups for the laboratory tour, putting on safety glasses before exploring the “Decon” lab with Xihui Kang and the “Fermentation” lab with Laura Fernandez, ABPDU engineers. The Decon lab carries out the initial upstream processing to break down biomass and extract the raw materials for fermentation; the same equipment is later used to purify fermentation products.



The Fermentation lab can optimize processes at both small scale (one or two liters) and at true pilot scale (300 liters) with automated control and sampling throughout each run. Runs in the 300 liter reactor often provide the first samples of potentially commercial products.



Laura also showed us an array of microreactors (0.1 liter) that have been very successful for optimizing processes that could then be transferred directly to pilot production:



Cal ACS is grateful to ABPDU staff for helping us organize this fascinating tour.

Alex Madonik, Chair-Elect 2024