



Department of Chemical  
and Biological Engineering  
UNIVERSITY OF WISCONSIN-MADISON

# 2020 Fall CBE Seminar Series

*presents:*



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ExxonMobil  
New York, NY

## **Investigating Opportunities and Challenges of Advanced Biofuels**

Global demand for transportation fuels is projected to rise by nearly 30 percent through 2040, and accelerating the reduction in emissions from the transportation sector will play a critical role in reducing global greenhouse gas emissions.

Advanced biofuels have the potential to increase energy supplies and reduce emissions. ExxonMobil has been researching and developing oil from algae to be used as a renewable, lower-emission alternative to traditional transportation fuels. We have worked with our collaborators toward developing strains of algae that demonstrate significantly improved photosynthetic efficiency and oil production through selection and genetic engineering of higher-performance algae strains. The research also includes an outdoor field study including engineering and regulatory aspects of algae biofuels in parallel with the genetic engineering work in the lab. We are also working to progress cellulosic biofuels. One approach is bio-conversion of cellulosic sugars to biodiesel. Challenges in converting these sugars include the mixed sugar streams present in cellulosic hydrolysate (e.g. xylose, glucose, and other C5/C6 sugars) and the presence of inhibitory compounds created as a byproduct of biomass deconstruction. Genetic engineering is a promising pathway to enable conversion of cellulosic sugars just as easily as first generation feedstocks. Catalytic approaches can also circumvent some of the challenges of biological conversion and offer potentially novel fuel compositions. The challenges and opportunities of these different approaches as well as some key learnings will be discussed.

**Tuesday, Nov. 3, 2020**

Lecture at 4:00 p.m.

<https://uwmadison.zoom.us/j/91376473708>