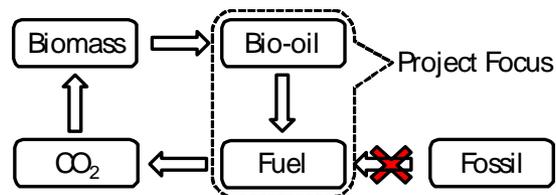




James E. ("Ned") Jackson

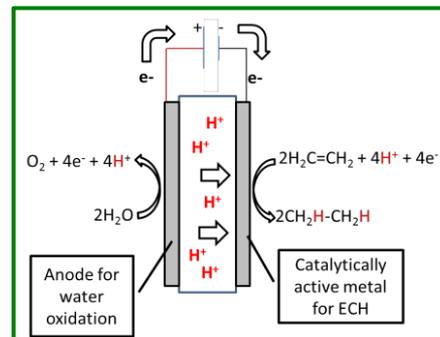
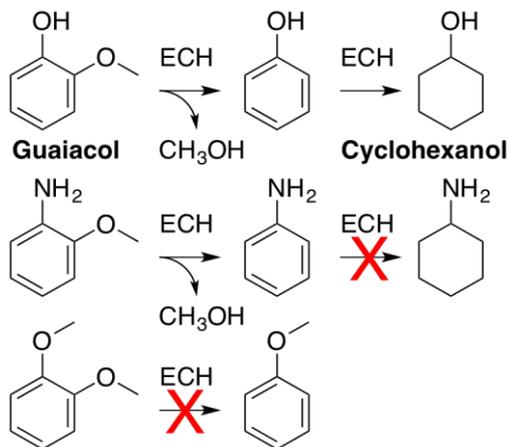
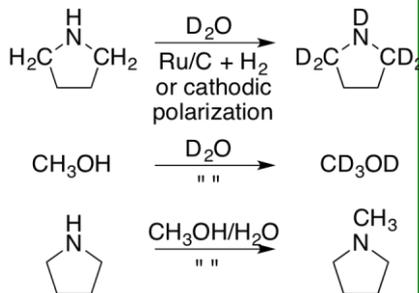
Green building blocks for a renewable future:
Paths to organic reaction discovery?

*Connecting Solar Electricity to Biomass Carbon to build
a New Foundation for Fuels and Chemicals Production*



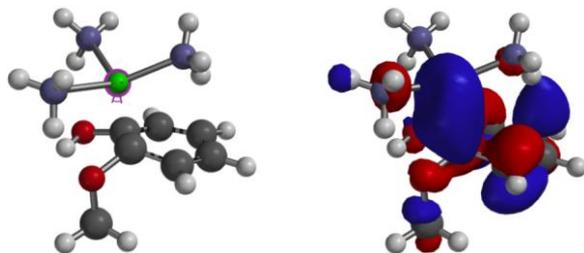
To wean our world from fossil fuels, we need the chemical tools to transform the renewable carbon in plant materials into the many classes of products that today come from petroleum refineries. Biomass (~CHOH average formula) is much more oxidized than the hydrocarbons of petroleum (~CH₂), so we need to remove O and add H to plant-derived compounds and mixtures. This requires energy, but not from burning fossil fuels. Since all fossil-free sources (solar panels, wind turbines, etc.) make electricity, we focus on electrocatalytic hydrogenations (ECH). Students participate in all components of these efforts:

*Discovery of reactions
(some never seen in
textbooks, like these!)*



*Design and construction of
reactors like this "Inverse Fuel
Cell" to make tomorrow's fuels*

*Quantum
chemical
modeling
to assess
reaction
paths and
energetics*



Precomplex undergoes C-O oxidative addn to cleave ether and thus form Ar-Ni+MeOH \times

