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**BIOMASS  
RESEARCH  
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# ODU BIOMASS RESEARCH LAB

Chemical processes have been a cornerstone of industrial evolution and societal progress. The development of sustainable chemical processes using green chemistry concepts can minimize resource use and environmental impacts. The Biomass (*bio microbial advanced separation systems*) Research Laboratory at Old Dominion University studies innovative sustainable chemical processes and ways to restrict the use of toxic and corrosive chemicals. The key objective is to develop sustainable chemical processes and products from waste and cultivated biomass using a systems approach that results in zero waste, high energy efficiency, zero toxicity, and minimal impact over the life cycle of the resulting bioproducts.

## Facilities & capabilities:

Located in 1000 square foot space within Kaufman Hall with additional 3000 square feet of shared common laboratory space.



## On-going research:

- Hydrothermal liquefaction of lignocellulosic/algal biomass to produce biocrude
- Catalytic upgradation of biocrude to produce liquid hydrocarbons
- Biochar application as a renewable sorbent for removing contaminants from water
- Hydrothermal carbonization (HTC) of biomass to produce solid fuels  
biochar produced via HTC is a high energy density (coal like) powder which can be compatible with coal infrastructure
- Cultivation of micro-algae using flash hydrolysis nutrient recycle
- Anaerobic digestion
- Electrochemical upgradation
- Nutrients recovery and recycling



## Advanced analytical instruments:

- Customized Dionex model: ICS-5000 ion chromatography system with auto sampler, conductivity and electrochemical detectors
- IC system is equipped with AminoPac PA10, CarboPac SA10, and IonPac AS18 4 mm Analytical Columns
- High pressure liquid chromatography (HPLC) system equipped with autosampler and UV/RI detectors
- Flash 2000 CHNS-O Organic Elemental Analyzer
- Tecator Digester 2508 with integrated programmable unit connected with distillation unit (KJELTEC8100)
- BET surface area and pore volume analyzer (Quantachrome NOVA 2200e)
- Total carbon/nitrogen (TOC/NOC) analyzer (Shimadzu)
- Pyro GS-MS
- Thermogravimetric Analyzer/DSC

