**Biodegradable Bioplastic Production from Forest Residues Biomass**

2022 MASBio Undergraduate Summer Research Opportunity

**Faculty:** Dr. Deepak Kumar, Dr. Timothy A. Volk, Dr. Obste Therasme

**Project Site:** Dr. Kumar’s lab (<https://sites.google.com/view/kumar-sbbl/>), Chemical Engineering Department, SUNY-ESF

**Project:** Biodegradable bioplastic production from forest residues biomass

**Brief Description:** Plastic waste in the environment is a pressing and difficult issue to solve. The use of polyhydroxyalkanoates (PHAs), biobased and biodegradable plastics, as an alternative to petroleum-based plastics, can address this issue. Despite the significant interest and efforts, the process has not been very successful at the commercial scale, mainly due to high production cost and scalable supply of inexpensive carbon sources. Forest residue biomass (FRB) generated from harvesting operations, including tops and branches and low-grade material, is one of the lowest cost feedstocks available. This project focuses on developing sustainable bioprocessing technologies to produce PHAs from FRB. The specific focus will be on using low severity pretreatment and achieve high sugar yields during biomass hydrolysis that can ultimately lead to high amounts of PHA production and reduce production costs.

The outcomes of this work will be helpful to the MASBio project as the project will help in realizing the sugar production potential using low-severity pretreatment on forest biomass, and the sugar produced from FRB could be used for the production of other bioproducts also.

**Background Required:** Educational background in either of agricultural engineering, forest biomaterials, chemical engineering, wood science and technology, bioprocessing, paper science and engineering. Knowledge of biomass structure and conversion technologies would be a plus.

**Additional Details**:

* All students are expected to participate in person at SUNY ESF in Syracuse, NY for the duration of the program (Monday May 23 – Friday July 29, 2022)
* The stipend for this summer research opportunity is $6,000.
* The program will include field trips to biomass/bioenergy partners and facilities in the region. Transportation will be provided for these activities.
* Housing is available for the 10 week period in the dorm at ESF at a cost of $1,000 (<https://www.esf.edu/welcome/campus/centennial.htm>)

**Application:**

Submit your resume, a statement of interest (maximum of one page), college transcripts (unofficial is acceptable) and two reference letters for review to: Dr. Timothy Volk, 306 Bray Hall SUNY ESF, Syracuse, NY 13210 or tavolk@esf.edu.