

## Master's Thesis or Student Research Project

### **Valorization of Biomass-Derived Waste for Sustainable Packaging Materials**

The efficient valorization of waste streams, particularly those derived from biomass transformation, is essential for promoting sustainable waste management and reducing our carbon footprint. Many natural by-products, such as lignocellulosic residues from the paper industry, polysaccharides from seafood processing, and proteins extracted from inedible feather or wool waste, are abundantly available at low cost and on a large scale.

These bio-sourced waste materials possess functional groups, including amine ( $\text{NH}_2$ ), hydroxyl (OH), and carboxylic acid (COOH) groups, which make them highly reactive and suitable for chemical modifications. This project will focus on the tailored modification of these functional groups to enhance and fine-tune the properties of bio-sourced materials, enabling their application in sustainable packaging solutions.

Through this work, you will help to develop high-performance, eco-friendly materials sourced from renewable resources. This work supports global efforts towards a circular economy and reduces environmental impact.

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