

## MWP – Young Researcher Abstract 2023

<b>Project title:</b> Controlling lignin structure during biomass processing to obtain high-performance bio-based materials.	
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<b>Abstract</b> (approx. 200 words): The aim of my research is to develop new and high-performant bio-based materials (e.g. detergents, dispersants, adhesives), with low environmental impact, starting from historically challenging and underutilized lignins and agricultural wastes. Feedstocks such as lignin present drawbacks related to their high chemical reactivity during biomass fractionation, that irreversibly change their structure. As lignin has traditionally been considered pulping by-product, limited effort has been put into understanding how to control its chemical structure and properties. Different fractionation methods will in fact lead to lignins bearing different functionalities, and hence different ideal applications. In my research work I use the unique approach of employing a wide array of existing and new analytical methods to study how the chemical structure of lignin is modified during each step of biomass processing. By doing so, I can tune fractionation parameters to obtain lignins with targeted and optimized functionalities, thus obtaining materials where the percentage of renewable aromatics can be enhanced and maximized. My goal is to precisely control the chemical structure of all biomass fractions, integrating my findings into existing or new biorefineries. My work will increase economic growth by creating new sources of revenues from waste products, reducing society's waste production and environmental impact.	
<b>Key words:</b> lignin, biomaterials, side streams, biomass fractionation	