

## MWP – Young Researcher Abstract 2024

Project title:	
Shedding Light on the Optical Properties of Colloidal Lignin Particles	
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Abstract (approx. 200 words):	
Lignin, the most abundant aromatic biopolymer in nature, provides plants with many advantageous	
properties including resistance to degradation from UV-radiation, microbes, and oxidants. While lignin shows	
great potential for use as a commercial UV-absorber, its naturally complex and heterogeneous structure, in	
addition to its colour impede efforts for implementation in consumer products. Current lignin valorization	
efforts focus on utilizing colloidal lignin particles (CLPs) with higher uniformity in size and surface chemistry.	
However, challenges persist in tailoring lignin's optical properties for application. In this work, we produce	
monodisperse colloidal lignin particles (diameter 70 – 250 nm) which interact differently with light through	
absorption, emission, and scattering. We investigate how the particle size and surface chemistry, as well as	
the lignin composition and structure contribute to these interactions. Understanding the interplay of these	
factors can aid in the development of tuneable photoluminescent lignin coatings and further advance lignin	
valorization efforts.	
Key words:	

Lignin, Light, Colloidal Particles, Photoluminescence, UV-absorbance