

MWP – Young Researcher Abstract 2026

Project title: Water-Repellent Textile Fibres from Wood		
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Abstract (approx. 200 words): Man-made cellulosic fibres are an established environmentally friendly alternative to synthetic textile fibres such as polyester, but their application portfolio is limited by their high water absorbency. Current water-repellent treatments use chemicals, such as PFAS, that can be harmful to the environment and human health and are facing increasing regulatory restrictions worldwide. The treatments are typically applied on the surface of fabrics, often leading to limited durability after repeated washing. A potential improvement is to incorporate non-toxic hydrophobising agents during fibre production, thereby integrating the chemical within the fibre structure. This project investigates the addition of hydrophobic alkyl ketene dimer (AKD) wax as a hydrophobising agent to a spinning solution of cellulose dissolved in an ionic liquid before fibre production by dry-jet wet spinning. The resulting fibres exhibit increased hydrophobicity compared to reference fibres without substantially affecting their mechanical properties. Incorporating the hydrophobising agent during fibre formation would eliminate the need for subsequent hydrophobising post-treatment of fabrics, reducing processing steps, energy consumption, and chemical use, thus lowering production costs and environmental impact. Furthermore, introducing hydrophobicity at the fibre-level could lead to more durable performance, extending the lifetime of water-repellent textile products, and thereby further decreasing their environmental impact.		
Key words: man-made cellulosic fibres, textiles, hydrophobisation, AKD, ionic liquid, Lyocell		