

New methods for the functionalisation of cellulose nanocrystals

Project description

In this project, we aim to develop novel catalytic methods for the synthesis of nanocellulose-polymer conjugates as thermally responsive materials. Utilising partially oxidised nanocellulose, we will develop methods for the catalytic radical decarboxylation of these materials, leading to a reactive radical on the cellulose backbone which will be used to initiate radical polymerisations. Use of the NIPAM monomer will lead to thermoresponsive materials which will undergo temperature controlled gelation due to the well-established changes in the hydrogen bonding patterns of NIPAM.

We will establish methods to control the degree of functionalisation of the cellulose, along with the molecular weight and dispersity of the polymer chains. By controlling these factors, we will be able to control the gelation temperature of the material, which is essential for its use in biomedical applications.

