



**Università degli Studi di Napoli Federico II**

**PhD in Biotechnology - 39<sup>th</sup> cycle**

**Dr. Marina Tanga**

**Development of sustainable bioprocess for  
saccharification of lignocellulose**

**Tutor(s):** Piero Salatino (ING-IND/25), Antonio Marzocchella (ING-IND/25)

**Department:** Università degli Studi di Napoli Federico II, Dipartimento di Ingegneria Chimica, dei Materiali e della Produzione Industriale, Piazzale V. Tecchio 80, 80125, Napoli.

Enzymatic hydrolysis (EH) of lignocellulosic biomass (LB), currently performed at industrial scale, still deserves research efforts to overcome several critical design issues. Among these, the optimization of enzymes dosage is affected by the accessibility of the holocellulose chains embedded in the LB fibers whose microstructure is dependent on the nature of the substrate (1) and is modified upon delignification pretreatments. The project aims at assessing the mass transfer (2) and biocatalytic phenomena controlling the cellulose accessibility to the enzymes in high-solids slurry and single LB particle systems at the micro-scale. The results will support the optimization of EH process for LBs relevant in the Mediterranean regions for bioenergy and biorefinery purposes. The developed methodology will be applied to evaluate the performances of novel carbohydrate active enzymes (CAZymes) against selected LBs.

**References**

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