

(OP 305) Ulvan: a New Natural Derived Biomaterial Obtained from Renewable Marine Resources

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It is not hard to understand the commitment set in tissue engineering research and the effort to find better performing materials. The ultimate goal: an ideal scaffold with cell and tissue compliant mechanical properties that supports cellular attachment, growth and differentiation. In this study, a new natural derived polysaccharide—ulvan—found at the cell wall of green algae *Ulva*, the common sea lettuce, was investigated. The aim of this research work is to study and develop novel biomedical applications based on this polysaccharide, with special emphasis to tissue engineering. The polysaccharide ulvan, composed of sulphated rhamnose, xylose, glucuronic and iduronic acids, was isolated from *Ulva* batch by step extraction using hot water and precipitation with organic solvents. The obtained polysaccharide was then used to produce polymeric films by solvent casting. As ulvan is soluble in water, a crosslinking step was necessary to render the membrane insoluble in water and more chemically stable at physiological conditions. Membranes produced were characterized by SEM and FTIR-ATR; swelling behavior and bioactivity was investigated and the mechanical performance assessed by both quasi-static tensile testing and dynamical mechanical analysis. The properties of ulvan structures studied in this work suggest a great potential of this natural sulphated polysaccharide for the herein envisaged applications. The knowledge generated during this work about the properties of this readily available polymer is a necessary and important step to uncover innovative biomedical applications.