

Polysaccharide based bio- and nanomaterials from seaweeds

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CV, publications and running projects be seen from [here](#)

Information about the research group can be seen from [here](#)

The PhD project focuses on development of novel polysaccharide-based bio-/nanomaterials with beneficial rheological and biological properties (e.g. can be used as high-value ingredients in food, pharmaceutical or cosmetic formulations).

The main experimental tasks of the project are as follows.

- Isolation of the beneficial compounds (polysaccharides, proteins, pigments) from the seaweed biomasses.
- General characterization and purification of the isolated compounds.
- Modification of the polysaccharides samples by chemical, enzymatic, ultrasonic treatment and characterization of the preparations by structural analysis and chromatographic methods.
- Optimization of the conditions for the preparation of high-value products/polyelectrolyte complexes/biomaterials on the basis of previously obtained pure polymeric samples.
- Characterization of the rheological and optical properties of the obtained biomaterials.
- Screening the samples for antioxidant, anticoagulant, anti-inflammatory, antimicrobial, anticancer activities.
- Testing the obtained bio-/nanomaterials in specific formulations.

The main analytical/instrumental methods used in the project are: multidetector HPLC, HPLC-PAD (pulsed amperometric detection), HPLC-MS, preparative chromatography, GC-MS/FID, NMR, FTIR, FT-Raman, spectrophotometry, fluorimetry, dynamic rheometry, automated ultrafiltration techniques, coagulometry, protein purification methods, assays on eukaryotic cell-lines.

Keywords: Carrageenans, Agars, Alginates, Fucoidans, Ulvans, Polysaccharides, Rheology, Biomaterials, Nanomaterials

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