Liana Chafran, PhD

Associate Professor, Department of Chemistry and Biochemistry

Education

PhD, Chemistry, University of Brasília

Key Interests

Smart Biomaterials | 3D Bioprinting | Microfluidic Devices | Biopolymers | Material Science

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SELECT PUBLICATIONS

- Chafran, L. S. *et al*. (2019). Preparation of PLA blends by polycondensation of D, L-lactic acid using supported 12-tungstophosphoric acid as a heterogeneous catalyst. *Heliyon*, 5(5), e01810.
- Chafran, L. S. *et al*. (2016). Synthesis of poly(lactic acid) by heterogeneous acid catalysis from d,l-lactic acid. *Journal of Polymer Research*, 23(6).

Research Focus

My research focuses on the synthesis and chemical modification of biopolymers and biomaterials through homogeneous and heterogeneous catalysis to obtain smart biomaterials, whose chemical, physical, and biochemical properties can be changed in response to an external stimulus such as temperature, pH, light, or contact with biomolecules (proteins, enzymes, DNA, or RNA). These smart biomaterials are used in the manufacture of smart medical devices, in the formulation and assembly of liposomal systems as testing platforms for pharmaceuticals and biomarkers discovery, in the synthesis of core-shell nanopolymers coated by cell membranes or target materials, in the synthesis of functionalized 3D scaffolds, and in biosensor and bioimaging applications. Furthermore, I work with 3D bioprinting technology for the biofabrication of new mimetics and biological constructs layer-by-layer, and for the manufacture of 3D microfluidics systems to provide an ideal testing platform for drug discovery and target validation that allow the elucidation of physiological interactions, (organ-on-a-chip or human-on-a-chip), under dynamic experimental conditions.

Current Projects

- The synthesis of thermoresponsive and pH-responsive smart biomaterials ("on-off" switch hydrogels)
- The manufacturing of bioinks and functionalized 3D structural scaffolds as smart biomaterials for 3D bioprinting processes
- The manufacturing of 3D microfluidics systems from 3D bioprinting (organ-on-a-chip and human-on-a-chip) for drug discovery and target validation