



Universidade Estadual de Maringá

Programa de Pós-graduação em Ciências Biológicas (PBC) – 2025

Disciplina: **Polysaccharides: properties, characterization and applications in the field of biomaterials.**

Carga horária = 15 h/aula (1 crédito)

Professor: Dra. Rachel Auzély (UGA-França)

Host Professors: Celso Vataru Nakamura e Francielle Pelegrin Garcia

Período: 04/09 a 25/09/2025 (5^ª a tarde)

Objectives: This course is focused on polysaccharides and hydrogels and contains several blocks: 1) The first part of the course will be devoted to a general introduction on carbohydrates followed by an overview of industrially and medically important polysaccharides from plant, animal, fungal and microbial sources. 2) Questions related to purification and analysis of structure and molar mass of polysaccharides will be discussed. 3) Then, the behaviour of polysaccharides in aqueous environment, as well as the main properties and methods for the characterization of polyelectrolytes derived from polysaccharides will be described. 4) Extensions to the use of polysaccharides through chemical modifications to produce hydrogels will be discussed. 5) The last part of the course will focus on applications of polysaccharide-based hydrogels in medicine.

Classes Schedule

04/09	1- General introduction to polysaccharides	2h/a
11/09	2- Introduction to characterization of water-soluble polymers and polysaccharides + exercises	5h/a
18/09	3- Properties and characterization of polyelectrolytes derived from polysaccharides	5h/a
25/09	4- Chemical modifications of polysaccharides and their application to the design of hydrogels	3h/a

References

- O. Smidsrød, S. Moe (2008). Biopolymer Chemistry. apir Academic Press, 2008 - Science - 398 pages
- L. Racine, I. Texier and R. Auzély-Velty, *Polym. Int.* **2017**, 66, 981-998.
- Charlot, R. Auzély-Velty, *Macromolecules* **2007**, 40, 1147-1158

- Charlot, R. Auzély-Velty, *Macromolecules* **2007**, 40, 9555-9563; c) T. Figueiredo, J. Jing, I. Jeacomine, J. Olsson, T. Gerfaud, J.-G. Boiteau, C. Rome, C. Harris, R. Auzély-Velty, *Biomacromolecules* **2020**, 21, 230-239
- T. Figueiredo, V. Cosenza, Y. Ogawa, I. Jeacomine, A. Vallet, S. Ortega, R. Michel, J. D. M. Olsson, T. Gerfaud, J.-G. Boiteau, J. Jing, C. Harris, R. Auzély-Velty, *Soft Matter* **2020**, 16, 3628-3641