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The research interest covers the areas of: (i) chemistry and physics of cellulose (structure, accessibility and reactivity of cellulose allomorphs; cellulose derivatives); (ii) preparation of nanocellulose; (iii) enzymatic hydrolysis of cellulose; (iv) modification of the surface properties of lignocellulosic fibers by cellulose-binding domain (CBD) adsorption; (v) hydrogels based on natural polymers (cellulose, lignin, xanthan, dextran, alginate, pullulan, carrageenan, etc.) for wound healing and tissue regeneration; (vi) cellulose-based aerogels for drug delivery applications; (vii) biomaterials based on nanoparticles (nanocellulose or lignin nanoparticles) for biomedical applications.

Scientific record: Articles published in international peer-reviewed journals (ISI ranked and included in international data bases): **45**; Articles published full-text in international conference volumes: **48**; Books: **3**; Book chapters: **15**; Patents (national, OSIM): **7 patents**; Research and development projects based on **9 international projects** and **25 national projects**, of which: **4** as project manager, **1** as MC member and **25** as member of the project; **Research stages:** University of Maribor, Maribor, Slovenia (Marie-Curie fellowship TOK, 2008-2009); Mines ParisTech, Centre de Mise en Forme des Materiaux (CEMEF), Sophia Antipolis, France („Hubert Curien-Brancusi” Program fellowship, 2017); University of Maribor, Maribor, Slovenia (2011); University of Barcelona, Barcelona, Spania (2012, 2018); Mines ParisTech, CEMEF, Sophia Antipolis, France (2013); **1867 citations** (Web of Science Core Collection) Hirsh-index = **19**

SELECTED SCIENTIFIC ARTICLES

1. Ciolacu D.E.; Nicu R.; Suflet D.M.; Rusu D.; Darie-Nita R.N.; Simionescu N.; Cazacu G.; Ciolacu F. Multifunctional hydrogels based on cellulose and modified lignin for advanced wounds management, *Pharmaceutics* 15(11), 2588 1-28 (2023) *F.I.* = 4.9.
2. Nicu, R.; Ciolacu, D.E.; Petrovici, A.R.; Rusu, D.; Avădanei, M.I.; Mihăilă, A.C.; Butoi, E.; Ciolacu, F. 3D matrices for enhanced encapsulation and controlled release of anti-inflammatory bioactive compounds in wound healing. *International Journal of Molecular Sciences*, 24(4), 4213, 1-20 (2023) IF = 4.9.
3. Ciolacu, D.E.; Rusu, D.; Darie-Niță, R.N.; Tîmpu, D.; Ciolacu, F. Influence of gel stage from cellulose dissolution in NaOH-water system on the performances of cellulose allomorphs-based hydrogels. *Gels*, 8, 410, 1-21 (2022) *F.I.* = 5.
4. Ciolacu, D.E.; Nicu, R.; Ciolacu, F. Natural polymers in heart valve tissue engineering: strategies, advances and challenges. *Biomedicines*, 10, 1095, 1-61 (2022) *F.I.* = 3.9.
5. Ciolacu, D.E.; Nicu, R.; Ciolacu, F. Cellulose-based hydrogels as sustained drug-delivery systems, *Materials*, 13(22), 1–37, 5270, 1-37 (2020) *F.I.* = 3.1.