

## MEMORIU ȘTIINȚIFIC

Drd. Mădălina-Ioana NECOLAU (PISCANU)

### Studii de doctorat

Perioada: 2020-2025

Conducător științific: Prof. Dr. Ing. Horia IOVU

Domeniu: Inginerie Chimică

Titlul tezei de doctorat: Design and synthesis of bio-sourced benzoxazine based materials from natural phenols: toward environmentally friendly and application-oriented composites and hybrid systems

### Activitate științifică

#### A. Lista de lucrări științifice (articole în reviste sau volume)

1. **M.I. Necolau**, E. I. Biru, M. Aldrigo, E. Olaret, A. Zaharia, G. Ciuprina, H. Iovu, A ternary multiscale nanocomposite system based on functionalized graphene oxide, carbon fibers and bio-based polybenzoxazine for electromagnetic shielding, (2025), Materials Advances, advance article, IF=4.7
2. **M.I. Necolau**, E. I. Bîru, E. Olaret, H. Iovu, Multi-Functional Hybrid Terpolymer Thermosets Based on Thiols, Bio-Based Epoxy and Benzoxazine Monomers, (2025), Polymers, vol. 17, 17, 2389, IF=4.9
3. **M.I. Necolau**, Biru E.I., Ghitman J., Stavarache C., Iovu H.; Insightful characterization of sesamol-based polybenzoxazines: Effect of phenol and amine chain type on physical and nanomechanical properties (2022), Polymer Testing 110 107578, IF=4.931
4. **M.I. Necolau**, Grigore. D., Biru E.I., Ghitman J., Stavarache C., Iovu H., Synthesis and thermo-mechanical characterization of vanillin-based polybenzoxazines with complex architecture, (2023), UPB Scientific Bulletin, Series B: Chemistry and Materials Science 85(1):3-16, FI=0.164
5. **M.I. Necolau**, M. Ionita, A.M. Pandele, Poly (propylene fumarate) Composite Scaffolds for Bone Tissue Engineering: Innovation in Fabrication Techniques and Artificial Intelligence Integration, (2025), Polymer, IF=4.9
6. **M.I. Necolau**, I.N. Radu, B. Bălănuță, A.N. Frone, C.M. Damian, Broadening the coating applications of sustainable materials by reinforcing epoxidized corn oil with single-walled carbon nanotubes, (2024), Environmental Science and Pollution Research, IF=5.8
7. **M.I. Necolau**, Damian C.M., Fierascu R.C., Chiriac A.L., Vlasceanu G.M., Vasile E., Iovu H.; Layered Clay–Graphene Oxide Nanohybrids for the Reinforcement and Fire-Retardant Properties of Polyurea Matrix (2021), Polymers 14 (1) 4212 FI=5
8. **M.I. Necolau**, Damian C.M., Olaret E., Balanuca B.; Comparative Thermo-Mechanical Properties of Sustainable Epoxy Polymer Networks Derived from Linseed Oil (2022), Polymers 14 (19) 4212 FI=5
9. **M.I. Necolau**, Damian C.M., Balanuca B., Frone A.N., Tailoring an Effective Interface between Nanocellulose and the Epoxidized Linseed Oil Network through Functionalization, (2023), ACS Omega, 8(18), FI=4.1
10. **M.I. Necolau**, Pandele A.M.; Recent advances in graphene oxide-based anticorrosive coatings: an overview (2020), Coatings 10 (12) 1149, FI=3.12
11. **M.I. Necolau**, , Balanuca B., Frone A.N., Radu I.N., Grădișteanu-Pîrcălăbioru G., Damian C.M., Combined Thermomechanical Effect of Graphene Oxide and Montmorillonite on Biobased Epoxy Network Formation for Coatings, (2024), ACS Omega 9, FI=4.1

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## Școala Doctorală Inginerie Chimică și Biotehnologii

12. Biru E.I., **Necolau M.I.**, Zainea A., Iovu H.; Graphene Oxide–Protein-Based Scaffolds for Tissue Engineering: Recent Advances and Applications (2022), *Polymers* 14 (5) 1032, FI=5
13. Komartin R.S., Balanuca B., **Necolau M.I.**, Cojocar A., Stan R.; Composite Materials from Renewable Resources as Sustainable Corrosion Protection Coatings (2021), *Polymers* 13 (21) 1642, FI=5
14. Vintila I.S., Draghici S., Petrescu H.A., Paraschiv A., Condruz M.R., Maier L.R., Bara A., **Necolau M.I.**; Evaluation of dispersion methods and mechanical behaviour of glass fibre composites with embedded self-healing systems (2021), *Polymers* 13 (10) 1624, FI=5
15. Bontas M.G., Diacon A., Calinescu I., **Necolau M.I.**, Dinescu A., Toader G., Ginghina R., Vizitiu A.M., Velicu V., Palade P., Istrate M., Rusen E.; Epoxy Coatings Containing Modified Graphene for Electromagnetic Shielding (2022), *Polymers* 14 (12) 2508, FI=4.329
16. Vlasceanu G.M., Ionita M., Popescu C.C., Giol D.E., Ionescu I., Dumitrascu A.M., Florea M., Boerasu I., **Necolau M.I.**, Olaret E., Ghitman J., Iovu H.; Chitosan-Based Materials Featuring Multiscale Anisotropy for Wider Tissue Engineering Applications (2022), *International Journal of Molecular Sciences* FI=6.208
17. Balanuca B., Komartin R.S., **Necolau M.I.**, Damian C.M., Stan R., Investigating the Synthesis and Characteristics of UV-Cured Bio-Based Epoxy Vegetable Oil-Lignin Composites Mediated by Structure-Directing Agents, (2023), *Polymers* 15(2):439, FI=5
18. Bolat F., Ghitman J., **Necolau M.I.**, Vasile E., Iovu H., A Comparative Study of the Impact of the Bleaching Method on the Production and Characterization of Cotton-Origin Nanocrystalline Cellulose by Acid and Enzymatic Hydrolysis (2023), *Polymers* 15(16):3446, FI= 5
19. Toader, G.; Diacon, A.; Rusen, E.; Mangalagiu, I.I.; Alexandru, M.; Zorilă, F.L.; Mocanu, A.; Boldeiu, A.; Gavrilă, A.M.; Trică, B., Pulpea D., **Necolau M.I.**, Istrate M.; Peelable Alginate Films Reinforced by Carbon Nanofibers Decorated with Antimicrobial Nanoparticles for Immediate Biological Decontamination of Surfaces, (2023), *Nanomaterials* 13, 2775. IF= 5.3
20. Damian C.M., **Necolau M.I.**, Neblea I., Vasile E., Iovu H.; Synergistic effect of graphene oxide functionalized with SiO<sub>2</sub> nanostructures in the epoxy nanocomposites (2020), *Applied Surface Science* 507 (30) 145046, FI=7.392
21. F. Bolat, **M.I. Necolau**, E.I. Bîru, A. Zaharia, H. Iovu, Comparative Analysis of Solvent Casting and Pickering Emulsion Techniques for Improving the Mechanical Properties of Surface-Modified Cellulose Nanomaterial-Reinforced Polylactic Acid Composites, (2024), *Polymers*, FI=5.0
22. I.C. Radu, D. Cozorici, **M.I. Necolau**, R.C. Popescu, E. Tanasa, L. Alexandrescu, C. Zaharia, R. Luque, Engineered 3D-printed poly (vinyl alcohol) vascular grafts: Impact of thermal treatment and functionalization, (2024), *International Journal of Bioprinting*, IF=6.8
23. A.I. Slabu, R. Stan, L. Miu, **M.I. Necolau**, B. Balanuca, F. Teodorescu, Sustainable strategy for the synthesis of novel vegetable oil derived polymeric materials, (2024), *Polymer for advanced technology*, IF=3.1
24. F. Bolat, **M.I. Necolau**, E.I. Biru, A. Zaharia, H. Iovu, Nanocrystalline cellulose modification with acrylic acid and furfuryl amine through Diels-Alder and Michael addition reactions, (2024), *UPB Scientific Bulletin, Series B: Chemistry and Materials Science* 85(1):3-16, FI=0.3
25. K. Duman, **M.I. Necolau**, A. Zaharia, H. Iovu, Enhancing mechanical properties of polyurea through cellulose nano crystals (cnf) reinforcement, (2025), *UPB Scientific Bulletin, Series B: Chemistry and Materials Science* 85(1):3-16, FI=0.3

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26. K. Duman, **M.I. Necolau**, E. I. Bîru, A. Zaharia, H. Iovu, Reactive nanofiller reinforced hybrid polyurea: The role of CNC in material preparation and characterization, (2025), Polymers, vol. 17, no. 11, 1527, IF=4.9
27. E. Rusen, A. Mocanu, O. Brîncoveanu, G. Toader, A. Diacon, M. Aldrigo, S. Iordănescu, G. Ciuprina, C. Romanițan, **M.I. Necolau**, Synthesis and characterization of a new material based on PET aminolysis product and MXenes, (2025), ACS Sustainable Resource Management
28. I.C. Radu, M. Teodorescu, C.M. Damian, M.I. Necolau, E. Tanasa, C. Stavarache, R.C. Popescu, C. Mustaciosu, A. Hudita, A. Tsatsakis, C. Zaharia, B. Galateanu, Tunable sericin nanocarriers for controlled drug release and glioblastoma targeting, (2025), Results in Engineering, 26, 108569, IF=7.9

**B. Cărți și manuale**

1. **M.I. Necolau**, A.M. Pandele, S.I. Voicu, Plant polysaccharides for nasal drug delivery. (2023), Plant Polysaccharides as Pharmaceutical Excipients, 275-295

**C. Participări la conferințe/workshop-uri**

1. „21th Romanian International Conference on Chemistry and Chemical Engineering” 2019, Constanta, Romania. “Synthesis of hybrid nanostructures based on graphene oxide and the evaluation of their influence in epoxy nanocomposites” -prezentare orală
2. „21th Romanian International Conference on Chemistry and Chemical Engineering” 2019, Constanta, Romania. “ Advanced Studies on Biobased Epoxy Network Curing Reactions and Thermal Properties” - poster
3. „11th International Conference on Materials Science and Engineering” 2019, Poiana Brasov, Romania, „Synergistic effect of graphene oxide and SiO<sub>2</sub> nanostructures in the epoxy nanocomposite coatings” - prezentare orală
4. 7th Young Polymer Scientists Conference and Short Course - 7YPSCSC 2021- online. "Sustainable approach to fabricate epoxy/nanocellulose composites and their properties" – prezentare orală
5. 5th virtual edition of polymers, plastics and composites - PPC 2021 -online. "Novel composite materials based on epoxidized vegetable oil and nanocellulose" - prezentare orală
6. 2nd Bucharest Polymer Conference - 2nd BPC 2021, Bucuresti, Romania."Bio-based epoxy networks. Comparative study of different curing systems" - Flash presentation
7. 4th International Symposium on Polybenzoxazines - ISPBZ 2021 - online " Synthesis and characterization of novel polyethyleneimine bio-based benzoxazine resins" - poster
8. 29th Annual GP2A Medicinal Chemistry Conference 2021 "Drug-loaded polymeric systems as a promising tool for cancer management" - poster
9. Polymers 2022-New Trends in Polymer Science: Health of the Planet, Health of the People. 2022, Torino, Italia "Epoxy sustainable nanocomposites reinforced with functionalized nanocellulose for electronic coatings" – prezentare orală
10. „22nd Romanian International Conference on Chemistry and Chemical Engineering”-2022 Sinaia Romania „Advanced Bio-sourced Polybenzoxazines with Tunable Properties”-Oral presentation

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11. „22nd Romanian International Conference on Chemistry and Chemical Engineering”-2022 Sinaia Romania „Sustainable Epoxy Nanocomposites Reinforced with Functional Nanocellulose Structures” - poster
12. 33rd International Conference on Diamond and Carbon Materials-2023. “Graphene oxide-montmorillonite nanohybrids as active fillers for bio-based epoxy thermosets” – Poster presentation
13. 33rd International Conference on Diamond and Carbon Materials-2023. „Composite materials derived from epoxidized corn oil and clay-carbon nanotubes hybrid structure”- Poster presentation
14. 3rd International Conference on Bioengineering and Polymer Science – 2023, Bucuresti, Romania. „Designing novel high-performance asymmetrical benzoxazine monomer through green chemistry” – oral presentation
15. 3rd International Conference on Bioengineering and Polymer Science – 2023, Bucuresti, Romania. „Hyaluronic Acid-Based Hydrogels as Potential Scaffolds for Tissue Engineering Applications” – poster presentation
16. „23rd Romanian International Conference on Chemistry and Chemical Engineering”-2024 Constanta-Mamaia, Romania „Advancing sustainability: bio-based thermoset nanocomposites for a greener future”- Oral presentation
17. „23rd Romanian International Conference on Chemistry and Chemical Engineering”-2024 Constanta-Mamaia, Romania „Expressing the potential of epoxidized corn oil into an efficient anticorrosion nanocomposite material” – Poster presentation
18. „23rd Romanian International Conference on Chemistry and Chemical Engineering”-2024 Constanta-Mamaia, Romania „ Bicomponent macromolecular architectures based on methacrylated linseed oil and alginate” -Poster presentation
19. 8th International Conference on Multifunctional, Hybrid and Nanomaterials , Montpellier Franta – 2025, „Bio-derived polybenzoxazines for advanced applications. Insightful thermal and mechanical characterization” - Oral presentation
20. 8th International Conference on Multifunctional, Hybrid and Nanomaterials , Montpellier Franta – 2025, „Ternary multiscale nanocomposite systems based on functionalized graphene oxide, carbon fibers and bio-based polybenzoxazine” - Poster presentation

**D. Brevete**

1. Bionanocompozite epoxidice din ulei de porumb ranforsate cu montmorilonit funcționalizat cu betaină, compoziție și metodă de obținere. Damian Celina Maria, **Necolau Mădălina Ioana**, Bălănuță Brîndușa, Radu Iulia Nicoleta, Nr. A/00210, 2024

**E. Proiecte de cercetare științifică**

1. Polimeri inovatori pe bază de nanotehnologie pentru sinteza de noi materiale avansate” (NAPOLI19), PN-III-P1-1.2-PCCDI-2017-0428, PCCDI 40/2018) , 2018-2020
2. Vectori nevrali bazați pe nanoparticule polimerice pentru terapia genică a cancerului” (NANOVEC), PN-III-P4-ID-PCE-2020-1448, 2021-2023
3. Rețele epoxidice durabile cu proprietăți reglabile utilizate ca materiale nanocompozite pentru acoperiri” (GREENanoNET), PN-III-P1-1.1-TE-2021-0627, 2022-2024

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4. Noi hidrogeluri inteligente bazate pe biopolimeri și oxid de grafena pentru terapia fototermală - GNaC ARUT /ARUT 2023, 2023-prezent
5. Nanocompozite pe bază de epoxi-celuloză cu proprietăți termo-mecanice echilibrate” (EPOCEL),PN-III-P2-2.1-PED-2019-5002, 2020-2022
6. Arhitecturi polimerice hidrofil-hidrofobe din surse naturale – o noua perspectivă în domeniul biomedical, GNaC ARUT /ARUT 2023 (contract number 100/11.10.2023, Renew), 2023-2025

**F. Membru în comitete de organizare sau comitete științifice ale conferințelor/colective de redacție ale unor reviste**

1. Membru in echipa de organizare a conferinței 23rd Romanian International Conference on Chemistry and Chemical Engineering -2024

Student-doctorand

**Mădălina-Ioana NECOLAU (PISCANU)**

