



## Curriculum vitae

### Personal information

First name / Surname **Maria Bercea**  
 Address 4, Ciornei Str., 700350, Iași, Romania  
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 Nationality Romanian  
 Date of birth 06.07.1961  
 Gender female

### Employment field Senior Researcher / Research Activities

#### Work experience

Occupation or position held Since 2003: Senior Researcher (CS I); 1988 – 2003: Scientific Researcher  
 Main activities and responsibilities Research activities in the field of rheology and thermodynamics of polymer based systems  
 Name and address of employer Petru Poni Institute of Macromolecular Chemistry, 41-A, Gr. Ghica Voda Alley, Iași, Romania  
 Main area of research Smart polymeric materials; Self-healing hydrogels and soft materials; Rheology of complex fluids including solutions, suspensions and gels; Thermodynamics of polymer solutions; Polymer blends  
 Dates, occupation or position held 1985 – 1988, Chemical Engineer  
 Main activities and responsibilities Training activities and solving production line problems; Quality control of the finite products  
 Sector, name and address of employer Industry, Pulp and Paper Factory, Suceava

### Education and training

Dates, fellowships **2000-2016** – 14 postdoctoral research fellowships (36 months in total) in Germany working in the fields of thermodynamics and rheology of polymer solutions at Institut für Physikalische Chemie, Johannes Gutenberg Universität, Mainz, in the team of Prof. Bernhard A. Wolf; financed by 5 DFG projects (coordinator of the Romanian side) and 1 POSTDRU project  
 Name and type of organisation providing education and training **1999-2013** – 6 postdoctoral research fellowships (6 months in total) working in the field of rheology at Ecoles des Mines de Paris, CEMEF Sophia-Antipolis (France), in the teams of Prof. Patrick Navard and Dr. Tatiana Budtova, financed by EU projects and European Society of Rheology  
**2000** – invited researcher at INSA Lyon (1 month) in the team of Prof. Daniel Nélías  
**1995** – postdoctoral research fellowship (12 months) in the field of rheology and rheo-optics of nanocomposites at CERMAV Grenoble (Prof. Jean-Yves Cavaille) and CEMEF Sophia-Antipolis (Prof. Patrick Navard), financed by Elf-Atochem (France)  
**1992** – a doctoral research fellowship (4 months) in the field of rheology at CEMEF Sophia-Antipolis (France) in the group of Prof. Patrick Navard, financed by Ecole des Mines de Paris  
 Dates, Title of qualification awarded **2017, Habilitation Thesis**  
 Principal subject *Complex fluids: from thermodynamic and rheological approaches to the design of new polymeric materials*  
 Name and type of organisation providing education and training School of Advanced Studies of the Romanian Academy  
 Dates, Title of qualification awarded **October 1990 – April 1994, PhD Thesis**, “Gh. Asachi” Technical University, Iași  
 Principal subject *Thermodynamic aspects of ultrahigh molecular weight polymers in solution*, PhD Supervisor: Prof. Bogdan C. Simionescu  
 Name and type of organisation providing education and training **1980-1985** – Chemical Engineer, specialty: Technology of Macromolecular Compounds “Gh. Asachi” Technical University, Department of Macromolecules, Iași, Romania

Researcher ID: C-8378-2011; <https://publons.com/researcher/C-8378-2011>  
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 Web page: <https://scholar.google.ro/citations?user=MsaasbwAAAAJ&hl=en>

#### Research topics

**Thermodynamics of polymer solutions**, theory and experiment:

- conformational characteristics of polymers in solution
- investigation of polymer/solvent and polymer/polymer interaction parameters
- a better understanding of cosolvency, co-nonsolvency and self-assembling phenomena

#### **Modeling the behavior of macromolecules in solution**

- an adequate thermodynamic description of polymer containing mixtures

**Complex fluids**, theoretical and experimental investigations of their dynamics during flow:

- shear flow of Newtonian and non-Newtonian polymer-based fluids
- viscoelastic fluids (polymer solutions/suspensions, melts, polymer containing mixtures)

**Polymer networks** (physical, chemical, double interpenetrated networks)

- polymer hydrogels, hybrid hydrogels, self-assembling systems and structured fluids
- stimuli-responsive materials and biomaterials, understanding and controlling their rheology
- self-healing, injectable hydrogels and 3D printing materials, biofilms

#### Scientific achievements

**210 papers** indexed by Web of Science (physico-chemistry of polymers, material science)

More than 200 participations at Romanian and international conferences

46 research projects obtained through national competitions (12 as project leader)

14 grants/contracts financed from abroad, at 7 projects as responsible from the Romanian side

**Hirsh Index = 36**, more than 4500 citations (Web of Science, all data, excluding self-citations), most of them in prestigious journals

#### Awards

1995 – „Nicolae Teclu” Prize accorded by Romanian Academy of Science

2009 – „Emilian Bratu” Medal accorded by Romanian Chemical Society

Mother tongue(s)

European level (\*)

English

French

#### Romanian

| Understanding |                 |         |                 | Speaking           |                 |                   |                  | Writing |                 |
|---------------|-----------------|---------|-----------------|--------------------|-----------------|-------------------|------------------|---------|-----------------|
| Listening     |                 | Reading |                 | Spoken interaction |                 | Spoken production |                  |         |                 |
| C1            | Proficient user | C1      | Proficient user | C1                 | Proficient user | B1                | Independent user | C1      | Proficient user |
| C1            | Proficient user | C1      | Proficient user | C1                 | Proficient user | C1                | Proficient user  | C1      | Proficient user |

#### Technical skills and competences

Advanced knowledge and very good skills in using the following experimental techniques:

1. Rheometry/Viscometry
2. Light scattering – static (SLS) and dynamic (DLS) methods
3. Osmometry
4. Headspace gas-chromatography (HGC)

Driving licence

B category

#### Additional information

Profesional Affiliation

- Founding member of the Romanian Society of Rheology, President 2019-2025

- Member of the Romanian Chemical Society, since 1992

August 20<sup>th</sup>, 2026

Dr. Maria Bercea

## Relevant publications

1. Lupu A., Gradinaru L.M.\*, Bercea M.\*, Avadanei M., Gradinaru V.R., Rosca I., Rusu D. [Smart supramolecular hydrogels as a potential platform for wound dressings: Harnessing thiamine to boost neomycin efficacy](#). *Reactive and Functional Polymers* **221**, 106648 (2026).
2. Petrovici A.-R.\*, Paraschiv V., Niculescu A., Zaltariov M., Bercea M., Simionescu N., Pinteala M., [New perspectives on the ozonated high-oleic sunflower oil physico-chemical behaviour](#). *Scientific Reports* **16**, 6931 (2026).
3. Ailincăi D.\*, Bercea M., Rosca I., Sandu I.A., Marin L. [Antimicrobial chitosan-based hydrogels: A novel approach to obtain sanitizers](#). *Carbohydrate Polymers* **354**, 123288 (2025).
4. Nita L.E.\*, Nacu I., Rusu A., Ghilan A., Bercea M., Rosca I., Mititelu Tartau L., Verestiuc L., Chiriac A., [3D printed patches based on modified hyaluronic acid with antibacterial and anti-inflammatory properties](#). *International Journal of Biological Macromolecules* **332** (Part 2) 148600 (2025).
5. Ailisei G.L., Popescu I.\*, Avadanei M., Bercea M., Suflet D.M., Ferariu A., Fundueanu G., [Water-soluble hydroxypropyl curdlan derivatives with thermosensitive properties](#). *Carbohydrate Polymers* **368** (Part 2) 124209 (2025).
6. Ailincăi D.\*, Bercea M., Rosca I., Sandu I.A., Marin L. [Chitosan based hydrogels as temporary implants for breast cancer postsurgical treatment and site-infections prophylaxis](#). *International Journal of Biological Macromolecules* **331**, 148453 (2025).
7. Plugariu I.A.\*, Gradinaru L.M., Bercea M. [New approaches concerning the gels used for topical delivery of meloxicam](#). *Gels* **11**, 500 (2025).
8. Bercea M.\*, Masuelli M., Wolf B.A.\* [Rheology of aqueous solutions of brea gum: Bimodal flow curves and \(apparent\) negative activation energies](#). *Food Hydrocolloids* **146**(Part A), 109217 (2024).
9. Lupu A., Bercea M.\*, Avadanei M., Gradinaru L.M., Nita L.E., Gradinaru V.R. [Temperature sensitive Pluronic F127-based gels incorporating natural therapeutic agents](#). *Macromolecular Materials and Engineering* 2400341 (2024).
10. Biliuta G.\*, Zhang S.F., Gradinaru L.M. Bercea M., Baron R.I., Bejan D., Coseri S.\* [Advanced pullulan nanofibers reinforced by cellulose fibrils as drug carriers for salicylic acid](#). *International Journal of Biological Macromolecules* **283**, Part 1, 137624 (2024).
11. Nita L.E.\*, Nacu I., Ghilan A., Rusu A.G., Serban A.M., Bercea M., Verestiuc L., Chiriac A.P. [Evaluation of hyaluronic acid-polymacrolactone hydrogels with 3D printing capacity](#). *International Journal of Biological Macromolecules* **256**, Part 2, 128279 (2024).
12. Ghilan A.\*, Bercea M., Rusu A.G., Simionescu N., Serban A.M., Bargan, A., Nita L.E., Chiriac A.P.\*, [Self-healing injectable hydrogels incorporating hyaluronic acid and phytic acid: Rheological insights and implications for regenerative medicine](#). *Journal of Biological Macromolecules* **279**, Part 1, 135056 (2024).
13. Chiriac A.P.\*, Ghilan A., Croitoriu, A., Serban A.M., Bercea M., Stoleru E., Nita L.E., Doroftei F., Stoica I., Bargan A., Rusu A.G., Chiriac V.M. [Study on cellulose nanofibrils/copolymacrolactone based nano-composites with hydrophobic behaviour, self-healing ability and antioxidant activity](#). *International Journal of Biological Macromolecules* **262**, Part 1, 130034 (2024).
14. Plugariu I.A., Gradinaru L.M. \*, Avadanei M., Rosca I., Nita L.E., Maxim C., Bercea M.\* [Thermosensitive polyurethane-based hydrogels as potential vehicles for meloxicam delivery](#). *Pharmaceuticals* **16**(11), 1510 (2023).
15. Nacu, I., Bercea, M., Nita, L.E., Peptu, C.A., Butnaru M., Verestiuc L.\* [3D Bioprinted scaffolds based on functionalized gelatin and PEGDA for soft tissue engineering](#). *Reactive and Functional Polymers*, 2023, **190**, 105636.
16. Bercea M.\*, [Rheology as a tool for fine-tuning the properties of printable bioinspired gels](#). *Molecules* 2023, **28**(6), 2766.
17. Bercea M.\*, Plugariu I.A., Gradinaru L.M., Avadanei M., Doroftei F., Gradinaru V.R. [Hybrid hydrogels for neomycin delivery: Synergistic effects of natural/synthetic polymers and proteins](#). *Polymers*, 2023, **15**, 630.
18. Biliuta G.\*, Dascalu A., Stoica I., Baron R.I., Bejan D., Bercea M., Coseri S.\* [Structural and rheological insights of oxidized cellulose nanofibers in aqueous suspensions](#). *Wood Science and Technology* **57**, 1443–1465 (2023).
19. Ailincăi D.\*, Bercea M., Mititelu Tartau L., Marin L., [Biocompatible drug delivery systems able to co-deliver antifungal and antiviral agents](#). *Carbohydrate Polymers*, **298**, 120071 (2022).

20. Gradinaru L.M.\*, [Bercea M.](#), Vlad S., Barbalata Mandru M., Drobota M., Aflori M., Ciobanu R.C. Preparation and characterization of electrospun magnetic poly(ether urethane) nanocomposite mats: relationships between the viscosity of the polymer solutions and the electrospinning ability. *Polymer* **256**, 125186 (2022).
21. [Bercea M.](#)\*, Constantin M., Plugariu I.A., Daraba M.O., Ichim D.L. Thermosensitive gels of pullulan and Poloxamer 407 as potential injectable biomaterials. *Journal of Molecular Liquids* **362**, 119717 (2022).
22. [Bercea M.](#)\* Bioinspired Hydrogels with Tunable Properties for Targeted Applications: Challenges and Opportunities. *Polymers* **14**(12), 2365 (2022).
23. [Bercea M.](#)\*, Wolf B.A.\* Solutions of polymer blends in highly saline water: Salt-induced inversions of viscosity effects for poly(ethylene oxide) + poly(sodium 4-styrenesulfonate). *Polymer* **241**, 124510 (2022).
24. [Bercea M.](#)\* Self-Healing Behavior of Polymer/Protein Hybrid Hydrogels. *Polymers* **14**, 130 (2022).
25. [Bercea M.](#)\*, Gradinaru L.-M., Morariu S., Plugariu I.-A., Gradinaru R.V. Tailoring the properties of PVA/HPC/BSA hydrogels for wound dressing applications. *Reactive and Functional Polymers* **170**, 105094 (2022).
26. [Bercea M.](#)\*, Wolf B.A.\* Detection of polymer compatibility by means of self-organization: poly(ethylene oxide) and poly(sodium 4-styrenesulfonate). *Soft Matter* **17**(20), 5214–5220 (2021).
27. [Bercea M.](#)\*, Gradinaru L.M., Mandru M., Vlad S., Nita L.E., Plugariu I.A., Albulescu R. Shear flow of associative polymers in aqueous solutions. *Journal of Molecular Structure* **1238**, 130441 (2021).
28. Brunchi C.-E.\*, Morariu S., [Bercea M.](#) Impact of ethanol addition on the behavior of xanthan gum in aqueous media. *Food Hydrocolloids* **120**, 106928 (2021).
29. [Bercea M.](#)\*, Plugariu I.-A., Associative interactions between pullulan and negatively charged bovine serum albumin in physiological saline solutions. *Carbohydrate Polymers* **246**, 116630 (2020).
30. [Bercea M.](#)\*, Morariu S. Real-time monitoring the order-disorder conformational transition of xanthan gum, *Journal of Molecular Liquids* **309**, 113168 (2020).
31. [Bercea M.](#)\*, Gradinaru L.M., Plugariu I.A., Mandru M., Tigau D.L. Viscoelastic behaviour of self-assembling polyurethane and poly(vinyl alcohol). *Polymer International* **69** (2), 149–155 (2020).
32. [Bercea M.](#)\*, Wolf B.A., Associative behavior of  $\kappa$ -carrageenan in aqueous solutions and its modification by different monovalent salts as reflected by viscometric parameters. *International Journal of Biological Macromolecules* **140**, 661–667 (2019).
33. Rusu A., Nita L.E., [Bercea M.](#), Tudorachi N., Diaconu A., Pamfil D., Rusu D., Ivan F.E., Chiriac A.\*, Interpenetrated polymer network with modified chitosan in composition and self-healing properties. *International Journal of Biological Macromolecules* **132**, 374–384 (2019).
34. [Bercea M.](#)\*, Biliuta G., Avadanei M., Baron R.I., Butnaru M., Coseri S. Self-healing hydrogels of oxidized pullulan and poly(vinyl alcohol). *Carbohydrate Polymers* **206**, 210–219 (2019).
35. Teodorescu M.\*, [Bercea M.](#), Morariu S. Biomaterials of PVA and PVP in medical and pharmaceutical applications: Perspectives and challenges. *Biotechnology Advances* **37**, 109–131 (2019).
36. [Bercea M.](#)\*, Gradinaru L.M., Mandru M., Ciobanu C., Tigau D.L. Intermolecular interactions and self-assembling of polyurethane with poly(vinyl alcohol) in aqueous solutions. *Journal of Molecular Liquids* **274**, 562–567 (2019).
37. [Bercea M.](#)\*, Wolf B.A.\* Intrinsic viscosities of polymer blends: sensitive probes of specific interactions between the counterions of polyelectrolytes and uncharged macromolecules. *Macromolecules* **51**, 7483–7490 (2018).
38. Teodorescu M.\*, [Bercea M.](#), Morariu S. Biomaterials of poly(vinyl alcohol) and natural polymers. *Polymer Reviews* **58** (2), 247–287 (2018).
39. Nita L.E.\*, Chiriac A.P., Rusu A.G., [Bercea M.](#), Diaconu A., Tudorachi N. Interpenetrating polymer network systems based on poly(dimethylaminoethyl methacrylate) and a copolymer containing pendant spiroacetal moieties. *Materials Science & Engineering C* **87**, 22–31 (2018).
40. [Bercea M.](#)\*, Wolf B.A.\* Viscometry of polyelectrolyte solutions: Star-like versus linear poly[[2-(methacryloyloxy) ethyl] trimethylammonium iodide] and specific salt effects. *European Polymer Journal* **93**, 148–157 (2017).
41. [Bercea M.](#)\*, Morariu S., Wolf B.A.\* Consequences of linking charged and uncharged monomers to binary copolymers studied in dilute solution. Part I: Viscometric behavior of the homopolymers, the effects of charging, and uncommon salt effects. *European Polymer Journal*, **88**, 412–421 (2017).
42. [Bercea M.](#)\*, Wolf B.A.\* Consequences of linking charged and uncharged monomers to binary copolymers studied in dilute solution. Part II: Non-additivity effects in the viscometric behavior. *European Polymer Journal* **88**, 422–432 (2017).

43. Nita L.E.\*, Chiriac A.P., Bercea M., Asanduleasa M., Wolf B.A. [Self-assembling of poly\(aspartic acid\)/BSA mixtures in aqueous solutions](#). *Int. J. Biol. Macromol.* **95**, 412–420 (2017).
44. Bercea M.\*, Morariu S., Teodorescu M. [Rheological investigation of poly\(vinyl alcohol\)/poly\(N-vinyl pyrrolidone\) mixtures in aqueous solution and hydrogel state](#). *Journal Polymer Research* **23**, 142 (2016).
45. Bercea M., Navard P.\* [Comparison of elasticity contributions during the flow of a cellulose derivative solution](#). *Cellulose Chemistry and Technology* **50**(5–6), 601–607 (2016).
46. Bercea M.\*, Wolf B.A.\* [Dependence of solvent quality on the composition of copolymers: Experiment and theory for solutions of P\(MMA-\*ran\*-t-BMA\)](#). *Soft Matter* **11**, 615–621 (2015).
47. Bercea M.\*, Bibire L.E., Morariu S., Teodorescu M., Carja G. [pH influence on rheological and structural properties of chitosan/poly\(vinyl alcohol\)/layered double hydroxide composites](#). *European Polymer Journal* **70**, 147–156 (2015).
48. Bercea M.\*, Morariu S., Bibire L.E., Carja G. [Chitosan/poly\(vinyl alcohol\)/LDH biocomposites with pH-sensitive properties](#). *Int. J. Polyme. Mat. Polym. Biomat.* **64**(12), 628–636 (2015).
49. Bercea M.\*, Wolf B.A. [Thermodynamics of copolymer solutions: How the pair of interactions contribute to the overall effect](#). *Journal of Physical Chemistry B* **118**(31), 9414–9419 (2014).
50. Spatareanu A., Bercea M., Budtova T., Harabagiu V., Sacarescu L., Coseri S.\* [Synthesis, characterization and solution behaviour of oxidized pullulan](#). *Carbohydrate Polymers* **111**, 63–71 (2014).
51. Brunchi C.E.\*, Morariu S., Bercea M. [Intrinsic viscosity and conformational parameters of xanthan in aqueous solutions](#). *Colloids and Surfaces B: Biointerfaces* **122**, 512–519 (2014).
52. Bercea M.\*, Morariu S., Rusu D. [In-situ gelation of aqueous solutions of entangled poly\(vinyl alcohol\)](#), *Soft Matter* **9**(4), 1244–1253 (2013).
53. Bercea M., Nita L.E., Eckelt J., Wolf B.A.\* [Polyelectrolyte complexes: phase diagram and intrinsic viscosities of the system water/poly\(2-vinylpyridinium-Br\)/poly\(styrene sulfonate-Na\)](#). *Macromolecular Chemistry and Physics* **213**(23), 2504–2513 (2012).
54. Bercea M., Nichifor M., Eckelt J., Wolf B.A.\* [Dextran-based polycations: thermodynamic interaction with water as compared with unsubstituted dextran, 2. Flory-Huggins interaction parameter](#). *Macromolecular Chemistry and Physics*, **212**(17), 1932–1940 (2011).
55. Bercea M.\*, Darie R.N., Nita L.E., Morariu S. [Temperature responsive gels based on Pluronic F127 and poly\(vinyl alcohol\)](#). *Industrial & Engineering Chemistry Research* **50**, 4199–4206 (2011).
56. Bercea M., Eckelt J., Morariu S., Wolf B.A.\* [Islands of immiscibility for solutions of compatible polymers in a common solvent: experiment and theory](#). *Macromolecules* **42**(10), 3620–3626 (2009).
57. Bercea M., Eckelt J., Wolf B.A.\* [Vapor pressures of polymer solutions and the modeling of their composition dependence](#). *Industrial & Engineering Chemistry Research* **48**(9), 4603–4606 (2009).
58. Bercea M.\*, Morariu S., Brunchi C.E. [Rheological Investigation of thermal induced gelation of poly\(acrylonitrile\) solutions](#). *International Journal of Thermophysics* **30**, 1411–1422 (2009).
59. Bercea M.\*, Bercea M. [Friction reduction in rolling bearing by using polymer additives](#). *Lubrication Science* **21**, 321–330 (2009).
60. Bercea M., Eckelt J., Wolf B.A.\* [Random copolymers: their solution thermodynamics as compared with that of the corresponding homopolymers](#). *Ind. Eng. Chem. Res.*, **47**(7), 2434–2441 (2008).
61. Bercea M., Wolf, B.A.\* [Vitrification of polymer solutions as a function of solvent quality, analyzed via vapor pressures](#). *The Journal of Chemical Physics* **124**(17), 174902 (7 pages) (2006).
62. Bercea M., Wolf, B.A.\* [Enthalpy and entropy contributions to solvent quality and inversions of heat effects with polymer concentration](#). *Macromolecular Chemistry and Physics* **207**, 1661–1673 (2006).
63. Bercea M.\*, Airinei A., Hamciuc V., Ioanid A. [Conformation of polysulfone-\*b\*-polydimethylsiloxane chains in solution and solid state](#). *Polymer International* **53**(11), 1860–1865 (2004).
64. Bercea M., Paleu V., Bercea I. [Lubricant oils additived with polymers in EHD contacts: Part 1 – Rheological behaviour](#). *Lubrication Science* **16**(2), 3–24 (2004).
65. Bercea M., Cazacu M., Wolf B.A.\* [Conformational variability of polymers and mixing thermodynamics I: Dilute solutions](#). *Macromolecular Chemistry and Physics* **204**, 1371–1380 (2003).
66. Bercea M., Bercea I. [A Rheological model based on primary laboratory data of the lubricants additived with polymers](#). *Macromolecular Symposia* **181**, 353–362 (2002).
67. Bercea M., Bercea I., Nelias D., Flamand L. [Polyethylene as additive for mineral oils. Part II. EHD traction behavior](#). *Tribology Transactions* **45**(2), 145–152 (2002).
68. Bercea M., Navard P.\* [Shear dynamics of aqueous suspensions of cellulose whiskers](#). *Macromolecules* **33**, 6011–6016 (2000).
64. Bercea M., Ioan C., Ioan S., Simionescu B.C.\*, Simionescu C.I. [Ultrahigh molecular weight polymers in dilute solutions](#). *Progress in Polymer Science* **24**, 379–424 (1999).