


## CURRICULUM VITAE

### Personal information

Name, Surname:	<b>Mariana Ioniță</b>	
Nationality:	Romanian	
Researcher unique identifier(s) (ORCID, Researcher ID etc.):	<a href="https://orcid.org/0000-0002-9563-7148">https://orcid.org/0000-0002-9563-7148</a> Scopus Author ID: 7003938586 Web of Science Researcher ID: C-5664-2012	

### Education

Year	Faculty/department - University/institution - Country
2019	<i>Habilitation Thesis</i> <i>University POLITEHNICA of Bucharest, Romania</i> Thesis title: “Graphene based biomaterials: opportunities, perspectives, and challenges”
2008	<i>Doctor of Philosophy in Bioengineering</i> <i>Department of Bioengineering, Faculty of Systems Engineering, Politecnico di Milano, Italy</i> Thesis title: “Coupling experimental and computational methods for the evaluation of permeability of bioartificial polymeric membrane materials”
2007	<i>Doctor of Philosophy in Chemistry</i> <i>Faculty of Applied Chemistry and Materials Science, University Politehnica of Bucharest, Romania</i> Thesis title: “Innovative methods to advance in synthesis of tailored materials for applications in electrochemistry processes”
2001	<i>M.Sc. degree in Industrial Chemistry</i> <i>Faculty of Industrial Chemistry, University Politehnica of Bucharest, Romania</i> Thesis title: “Simulation of methyl methacrylate polymerization and study of initiator influence”

### Positions - current and previous

(Academic sector/research institutes/industrial sector/public sector/other)

Year	Job title – Employer - Country
2011-present	Professor/Associate Professor - <i>University Politehnica of Bucharest, Department of Bioengineering and Biotechnology, Faculty of Medical Engineering, Romania</i>
2009-present	Project co-ordinator - <i>University Politehnica of Bucharest, Romania</i>
2016-present	Project manager/Group leader - <i>Advanced Polymer Materials Group, University Politehnica of Bucharest, Romania</i>
2005-2008	Research Fellow-Marie-Curie Fellowship, FP6-NMP3-CT-2005-013644, FP6-MEST-CT-2004-504465 - <i>Politecnico di Milano, Italy,</i>

2003-2004	Research Fellow-Marie-Curie Fellowship - <i>Universita degli Studi di Milano, Italy</i>
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### Project management experience

(Academic sector/research institutes/industrial sector/public sector/other. Please list the most relevant.)

Year	Project title - Role – Funder – Budget – link to project webpage
2009-2011	Coupling multiscale molecular modelling with experiments for the design and characterization of nanostructured composite materials, Project co-ordinator, PNII-RP 12/2012, 460.000 RON
2012-2016	Developing new graphene-polymer composites biomaterials for scaffold fabrication with applicability in bone repair by coupling multiscale molecular modelling and experiments, Project co-ordinator, PN II PCCA 140/2012, 2.000.000 RON
2013-2016	Multi-scale computational approach and experiments towards knowledge-based design of polymer-graphene membrane materials for selective gas separation, Project co-ordinator, PN II TE 17/2013, 705.000 RON
2015-2016	3D Modelling Techniques for Biomedical Engineering, Project co-ordinator, 3/2016 - SEE Financial Mechanism, University Politehnica of Bucharest and Reykjavik University, Project co-ordinator, 41.605 EURO
2016-2017	MOBILE II – Winter School SEE, Project co-ordinator, 7/2016 - SEE Financial Mechanism 2009-2014 University Politehnica of Bucharest and Reykjavik University, 49.820 EURO
2016-2021	A novel graphene biosensor testing osteogenic potency; capturing best stem cell performance for regenerative medicine-GRABTOP, Project manager, POC Axa POC-A1-A1.1.4-E2015, ID P_37_221-GRABTOP, 8.088.385,50 RON, <a href="http://grabtop.upb.ro/">http://grabtop.upb.ro/</a>
2018-2020	Super carbonaceous materials for selective separation; multi-scale computer-aided molecular design and engineering-SUCCESS, Project co-ordinator, PN III TE 122/2018, 449950 RON
2022-2023	Mixed Reality e-learning platform dedicated to Medical Engineering (REALME), SEE Financial Mechanism, University Politehnica of Bucharest and Reykjavik University, Project coordinator, 21-COP-0017, 148.054,00 EURO, <a href="https://realme.chimie.upb.ro/">https://realme.chimie.upb.ro/</a>
2022-2024	Toolbox for personalized bone regeneration; tailoring solutions for tomorrow (REOSTEOKIT), Project co-ordinator, PCE 103 from 07/06/2022, 1.200.000,00 RON, <a href="https://reosteokit.chimie.upb.ro/">https://reosteokit.chimie.upb.ro/</a>
2023-2026	Advanced & personalized solutions for bone regeneration and complications associated with multiple myeloma (REOSTEOMI), Project co-ordinator, PNRR-III-C9-2022 – I8 - 760093 /23.05.2023, 6.970.685.00 RON, <a href="https://reosteomi.chimie.upb.ro/">https://reosteomi.chimie.upb.ro/</a>

### Other relevant professional experiences

Year	Description - Role
Present	Member of the National Council of Scientific Research Materials Science Commissions
Present	Expert-Reviewer / Rapporteur UEFISCDI
2023	Transnational Multiplier Event, Bucharest, Romania
2018-2021	Member of editorial board of Composite Part B: Engineering Journal
2019	“Daniel Bunea” prize awarded yearly by the Romanian Society of Biomaterials to recognize contribution to develop biomaterials field
2020-present	Editor of Advances in Polymer/Graphene Composite for Bio-Applications – Coatings (MDPI), Carbon-Related Materials for Bioengineering - Materials (MDPI), Application of Graphene-Based Sensors in Biomolecular Detection - Biosensors, (MDPI)
Present	Regular reviewer for Composite Part B: Engineering, Coatings, Carbohydrate Polymers,

	Biosensors
2006-present	Lecturing frequently at national and international meetings, in the last 10 years more than 100 presentations at national and international scientific conferences as a keynote speaker, with plenary lectures, or symposia presentations
2015	Organizer of 1 <sup>st</sup> International Conference 3D Modelling Techniques for BioMedical Engineering, Bucharest, Romania
2016	Co-organizer of Biomedical Winter School in University of Reykjavik, Iceland
2016, 2023	Visiting Professor - University of Reykjavik, Iceland
2007	PhD student - Technical University of Denmark, Denmark
2005, 2006	PhD student - University of Pisa, Italy
2021-present	Collaboration within Post-doctoral fellowship grant, Icelandic Centre for Research (RANNIS), Grant number 228340-051
2023	Organizer of Transnational Multiplier Conference October 18-19, 2023

## C.2 Track record of the last 10 years

*A list of the ten most important scientific outputs (publications, patents, technologies etc.):*

1. Cernencu, A.I., **Ioniță, M.**, “The current state of the art in gellan-based printing inks in tissue engineering”, CARBOHYDRATE POLYMERS, I.F. 11.2, Q1, JUN 1 2023, 309, 12067, 10.1016/j.carbpol.2023.120676, Article, WOS:000944256100001.
2. Cernencu, A.I., Vlasceanu, G.M., Serafim, A., Pircalabioru, G., **Ioniță, M.**, “3D double-reinforced graphene oxide - nanocellulose biomaterial inks for tissue engineered constructs”, RSC ADVANCES, I.F. 3.9, Q1, AUG 4 2023, 13, 34, 24053, 24063, 10.1039/d3ra02786d, Article, WOS:001045110000001.
3. Boretti, G., Giordano, E., **Ioniță, M.**, Vlasceanu, G.M., Sigurjónsson, O.E., Gargiulo, P., Lovecchio, J., “Human Bone-Marrow-Derived Stem-Cell-Seeded 3D Chitosan-Gelatin-Genipin Scaffolds Show Enhanced Extracellular Matrix Mineralization When Cultured under a Perfusion Flow in Osteogenic Medium”, MATERIALS, I.F. 3.4, Q2, SEP 2023, 16, 17, 5898, 10.3390/ma16175898, Article, WOS:001062797800001.
4. Ofiteru, A.M., Becheru, D.F., Gharbia, S., Balta, C., Herman, H., Mladin, B., **Ioniță, M.**, Hermenean, A., Burns, J.S., Qualifying Osteogenic Potency Assay Metrics for Human Multipotent Stromal Cells: TGF- $\beta$ 2 a Telling Eligible Biomarker, Cells, I.F. 6.0, Q1, 2020, 10.3390/cells9122559, WOS:000601840900001.
5. Muraru S., **Ioniță M.**, „Super Carbonaceous Graphene-based structure as a gas separation membrane: A Non-Equilibrium Molecular Dynamics Investigation”, Composites Part B: Engineering, I.F. 13.1, Q1, 2020, Volum 196, p. 108140, ISSN: 1359-8368, DOI: 10.1016/j.compositesb.2020.108140, 2020, Article, WOS:000540219500026.
6. Vlăsceanu G.M., Iovu H., **Ioniță M.**, “Graphene inks for the 3D printing of cell culture scaffolds and related molecular arrays”, Composites Part B: Engineering, I.F. 13.1, Q1, Volum 162, pagini 712-723, 2019, Article, WOS:000460193400068.
7. **Ioniță, M.**, Crică, L.E., Voicu, S.I., Dinescu, S., Miculescu, F., Costache, M., Iovu, H., „Synergistic effect of carbon nanotubes and graphene for high performance cellulose acetate membranes in biomedical applications”, Carbohydrates Polymers, I.F. 11.2, Q1, Volum 183, 2018, Pagini 50-61, 2018, Article, WOS:000423715000006.
8. Hermenean A, Codreanu A, Herman H., Balta C., Rosu M., Mihali C.V., Ivan A., Dinescu S., **Ioniță M.**, Costache, M., „Chitosan-Graphene Oxide 3D scaffolds as Promising Tools for Bone Regeneration in Critical-Size Mouse Calvarial Defects”, Scientific Reports, I.F. 4.6, Q1, 2017, Volum 7, Article no 16641, 2017, WOS:000416891400043.
9. Vlăsceanu, G.M., Amărandi, R.M. **Ioniță, M.**, Tite, T., Iovu, H., Pilan, L., Burns, J.S., „Versatile

- graphene biosensors for enhancing human cell therapy”, *Biosensors and Bioelectronics*, I.F. 12.6, Q1, Volum 117, 2018, Pagine 283-302, 2018, Article, WOS:000442191900036.
10. Toader G.A., Grigorean V.T., **Ioniță M.**, “Solid Phase Oligo-DNA Extraction from Complex Medium Using an Aminated Graphene/Nitrocellulose Membrane Hybrid”, *Biomolecules*, I.F. 5.5, Q1, 2024; 14(3):366. <https://doi.org/10.3390/biom14030366>, Article, WOS:001191515400001.

### C.3 Narrative CV

*A narrative summarizing which work has had the greatest importance and impact.*

Prof. Mariana Ioniță had first approached the field of developing solutions for the biomedical field during her **PhD studies** in bioengineering at **Politecnico di Milano** (2008) performed with Prof. Franco Maria Montecvecchi (inventor of motor protein), concluded with the thesis titled “*Coupling experimental and computational methods for the evaluation of permeability of bioartificial polymeric materials*”, a topic she has been developing since and wrapped-up in the habilitation thesis titled “*Graphene based biomaterials: opportunities, perspectives and challenges*” (2019), which addresses her contribution to the recent advance of graphene based biomaterials and their biomedical applications. Since 2010, she has conducted ground-breaking extensive research geared towards developing graphene based biomaterials capable of mimicking the bone microenvironment, improved membranes for biomedical field such as hemodialysis and drug delivery systems, and optical and electrochemical biosensors for capturing best stem cell performance for regenerative medicine. When prof. Ioniță started this research, there was much anticipation in regard to graphene and graphene based biomaterials contribution to regenerative medicine and their potential as ultimate biosensors, being ground-breaking worldwide (see published paper list). Her team’s exceptionally discovered graphene based biomaterials exhibited undeniable benefits compared to the dated technologies and have generated great excitement in regard to the imminent utilization in medicine application. Some of the most important achievements related to this field involves complex science merging engineering, materials science, physics, *in silico*, *in vitro* and *in vivo* techniques, used to develop several novel biocomposite materials for bone regeneration, e.g., graphene oxide/chitosan–polyvinyl alcohol, **sodium alginate/graphene oxide**, within the framework of the project PN-II-PCCA/140/2012 or PN II-TE 17/2013. The novelty of the topic generated remarkable results, e.g., 100% **novel sodium alginate/graphene oxide** biocomposite material (**Ioniță, M.** et al., *Carbohydrate Polymers*, 2013, over 350 citations), that has significantly influenced the landscape of tissue engineering, being the **most cited article** of *Carbohydrate Polymers* journal for several years.

Another outstanding scientific achievement was the discovery (first time reported in the literature) that graphene oxide promotes cells growth and proliferation. The results were developed within the framework of PN II PCCA 140/2012 project and later confirmed by other of her studies (see publications list 3, 4, 7). Unfortunately, at that time, prof. Ioniță did not realize the magnitude of such result. The first *in vivo* performance of biopolymer-graphene biomaterials in mice model was also reported by her team, indicating that the material is a feasible alternative for current treatment options in the restoration of non-healing bone (see publications list 8). Conversely, in her previous work developed in the framework of EU POC-A1-A1.1.4-E-2015 P\_37\_221 was demonstrated that innovative electrochemical biosensors has potential to accelerate measurements and reduce cost and effort, while designing for the first time an optical graphene based biosensor able to measure the biomarkers in the complex milieu of real life application (see publications list 4, 9); it was proposed the first reliable mechanism of oligonucleotide adsorption on graphene by molecular dynamics and the quality and applicability of the results generated both high-regarded publications and a patent. The idea of **printable formulation and graphene inks** in biomedicine was also advanced for the **3D printing** of cell culture scaffolds and related molecular arrays (see publications list 1, 2, 6). The known challenge of **functional heterogeneity among human multipotent stromal cells** (hMSC) is another topic approached by the project leader. Demonstrating for the first time that decorin, TGF-β2, and

mRNA provide discriminatory power for resolving donor-specific heterogeneity while histomorphometric decorin and TGF- $\beta$ 2 protein expression patterns discriminated the non-bone-forming hMSC. This data facilitates the progress towards prompt osteogenic potency assays, needed by current clinical trials to accelerate improved intervention with enhanced stem cell therapy for serious bone fractures (see publications list 4). In the framework of the PNII-RP 12/2012 project, prof. Ioniță started a pioneering work (in Romania), which continued within the framework of PN-II-PCCA/140/2012 and PN III TE 122/2018. This work stands as one of the few worldwide endeavours in the field of hierarchical **multiscale computer-aided molecular modelling and design** complemented with **computer-assisted evaluation** for the understanding and knowledge-based design of improved materials for different applications, one of them being efficient solutions for selective separation in bioengineering field based on super carbonaceous materials (see publications list 5).

Her career took off being the co-ordinator/responsible of complex on-going PCE-103/07.06.2022 (REOSTEOKIT) and PNRR-III-C9-2022–I8–760093/23.05.2023 (REOSTEOMI) projects, which aim to develop advanced and personalized solutions for bone regeneration. The projects introduce unique approaches for bone regenerative medicine to improve implementation of existing cell/acellular bone solutions for serious complications of non-union bone fractures, but also applies knowledge acquired with this approach to devise **new regenerative medicine** products to treat the devastating complication of bone disease in **multiple myeloma (MM)**, or reliable portable devices monitoring in real time the osteogenic potential of human mesenchymal stem cells, i.e., quantitative measure of bone formation. For all of these applications **4D/5D bioprinting** technology is used (see publications list 1, 2, 10). Moreover, human resources and strong infrastructure preservation, consolidation and development has been her main priority in the last years. She established 4 new laboratories encompassing excellent cutting edge equipments and a young and highly motivated international research team (2 MSc Students, 5 PhD students, 1 Post-Doc student, ER (experience researcher) performing highly innovative multidisciplinary science contributing to development of novel products for healthcare industry.

To summarise, prof. Mariana Ioniță was educated at top level universities and gained her PhD in chemistry in 2007 and in bioengineering in 2008. Currently she is carrying out very active research, leading a scientific group of 8 people, and is involved in teaching activities at Faculty of Medical Engineering, focusing on tissue engineering and soft implants engineering. She published 88 peer reviewed papers (ISI), coordinated 10 scientific grants/projects and participated as PI in more than 15 national and international grants (101087007 - eBio-hub — HORIZON-WIDERA-2022-TALENTS-01FP6-NMP3-CT-2005-013644, FP6-MEST-CT-2004-504465). She was awarded numerous scientific awards, organized several international scientific events and has been invited as chair to many international conferences (e.g., ICCE-2015), appointed board member of conferences (e.g., IUMRS-ICAM2017-Carbon Related Materials Special Symposium), referee for many ISI journals, member of European Society for Composite Materials and of Romanian society of Biomaterials, and board member of Composite Part B: Engineering journal.

Her research activity is contributing to advancement of knowledge in the biomaterials field and biomedical applications, both computational and experimental, being responsible for day-to-day co-ordination, consolidating the project planning, progress reports, budgetary overviews, etc., developing important international collaboration and organizing international scientific events. Thus, she actively contributes to the development of therapies for tomorrow advancing the **frontiers of knowledge**, building a scientific team and consolidating its scientific expertise whilst expanding activities and **enhancing competitiveness** in a field of considerable interest, i.e., healthcare industry.