



Raluca Borlan

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Date of birth: 31/08/1993 **Nationality**: Romanian

WORK EXPERIENCE

Institute for Interdisciplinary Experimental Research in Bio-nano-sciences, Babes-Bolyai University

[05/2022 – Current] **Postdoctoral Researcher**

Institute for Interdisciplinary Experimental Research in Bio-nano-sciences, Babes-Bolyai University

[12/2018 – 05/2022] **Research Assistant**

EDUCATION AND TRAINING

**Doctoral Researcher Entrepreneur Scholarship, Project POCU/380/6/13/123886;
Project title: Entrepreneurship for innovation through doctoral and postdoctoral
research**

[07/2020 – 06/2021]

[2018 – 2021] **PhD in Physics**

Babes Bolyai University

[2016 – 2018] **Master of Science in Biomaterials, Faculty of Physics**

Babes Bolyai University

[2013 – 2016] **Bachelor of Science in Medical Physics, Faculty of Physics**

Babes Bolyai University

SPECIALIZATIONS AND QUALIFICATIONS AS YOUNG SCIENTIST

**Training JRC Nanobiotechnology Laboratory: Open Access to JRC Research Infrastructures for
Training and Capacity Building (2024)**

Training Zeiss: Basics of Confocal Microscopy (2024)

Workshop: Carl Zeiss Microscopy Democenter Oberkochen (2022)

Workshop: Advanced nano- and micro-structured materials for medical applications (2022)

Webinar: BioPhotonics Conference (2022)

Workshop Zeiss: Accelerating Discovery. Remote Workshop Series (2021)

Thematic school: All-optical interrogation of neuronal networks in vivo (2021)

**Trainee at NLMC, Interdisciplinary Research Institute in Bio-Nano-Sciences, Babes Bolyai
University, Cluj-Napoca, Romania – Master's Degree (2017 - 2018)**

HONOURS AND AWARDS

Excellence Diploma

Experienced Researchers – Research Teams awarded by the Ministry of Research, Innovation and Digitalization at the 1st Romanian Research Gala (2023)

TEACHING ACTIVITIES

Teaching Laboratories: Spectroscopy Complements. Master Students, Faculty of Physics, Babes-Bolyai University (2023-2024)

Teaching Laboratories: Introduction to Dynamic Light Scattering and Zeta Potential Analysis. Bachelor Students, Faculty of Physics, Babes-Bolyai University (2023-2024)

Teaching Laboratories: Protein-based Nanoparticles: Changes in the Hydrodynamic Diameter and Zeta Potential as a Function of pH. Master Students, Faculty of Physics, Babes-Bolyai University (2022)

Teaching Laboratories: Applications of Ultraviolet-Visible Spectroscopy. Bachelor Students, Faculty of Physics, Babes-Bolyai University (2022)

Supervision of 7 Undergraduate Theses

JOB-RELATED SKILLS

Design and development of magnetic and organic nanoparticles for biomedical applications

Synthesis, functionalization, and physicochemical characterization of nanomaterials (UV-Vis, fluorescence, DLS, zeta potential)

Nanoparticles biofunctionalization for targeted delivery, therapy, selective biosensing and fluorescence-guided imaging

Preparation and analysis of agarose-based and biological phantoms for theranostic studies

Evaluation of nanoparticle biocompatibility and cellular uptake (in vitro and ex vivo)

Phototherapy techniques (PDT and PTT) using laser or LED irradiation — applied in solution, in vitro, and in vivo experiments

Optical Microscopy: Confocal Microscopy, Fluorescence Microscopy

EXPERIENCE IN RESEARCH PROJECTS AND GRANTS

International

1. Key Member in an **International Research Open Access Project** (Nanobiotechnology laboratory 2022-1-RD-NanoBiotech) awarded by competition by the *European Commission Joint Research Centre*
2. Key Member in the **Bilateral Cooperation Project Brâncuși** Romania-France, PN-IV-P8-8.3-PM-RO-FR-2024-0144

National

1. Key Member in [PNRR-III-C9-2022-I8-CF-199](#)
2. Key Member in [PN-III-P4-PCE-2021-1572](#)
3. Key Member in [PN-III-P2-2.1-PED-2021-3342](#)
4. Key Member in [PN-III-P4-ID-PCE-2020-0542](#)
5. Key Member in [PN-III-P2-2.1-PED-2019-4558](#)
6. Key Member in [PN-III-P4-ID-PCCF-2016-0142](#)
7. Key Member in [PN-III-P1-1.2-PCCDI2017-0010](#)

Institutional

1. Director of SRG-UBB 32995/23.06.2023 (**Starting Research Grant** from UBB)

[**LED-Activated NIR-II Gold Nanorods for Photothermal Therapy of 3D Melanoma Spheroids**](#)

A Holca, **R Borlan**, A Campu, S Dragan, M Muntean, A M Craciun, A Sesarman, M Banciu, S Astilean, M L de la Chapelle, M Focsan; **2025**, *ACS Applied Nano Materials* (IF 2024: 5.5)

[**From Fundamentals to Applications: Magnetic Nanoparticles for MRI Imaging and NIR-Induced Thermal Activation in Tissue-Mimicking Environments**](#)

R Lapusan, A Balmus, R Fechete, B V Neamtu, J Ponti, **R Borlan**, M Focsan; **2025**, *Journal of Materials Chemistry B* (IF 2024: 5.7)

[**Antioxidant Activity and Cytotoxicity Evaluation of New Catechol Hydrazinyl-Thiazole Derivatives as Potential Protectors in Retinal Degenerative Processes**](#)

R G Antemie, G Marc, R Pele, I Fizesan, I V Crestin, **R Borlan**, P Theodosis-Nobelos, E A Rekka, O Oniga, O Crişan, A Pirnau, L Vlase, S V Clichici; **2025**, *Antioxidants* (IF 2024: 6.6)

[**Dual-Modal Near-Infrared Organic Nanoparticles: Integrating Mild Hyperthermia Phototherapy with Fluorescence Imaging**](#)

R Borlan, M Tudor, O Soritau, A Florea, E Pall, B Pop, D Maniu, S Astilean, M Focsan; **2024**, *International Journal of Nanomedicine* (IF: 6.5)

[**Plasmon-enhanced photocatalysis: New horizons in carbon dioxide reduction technologies**](#)

M Tudor, **R Borlan**, D Maniu, S Astilean, M Lamy de la Chapelle, M Focsan; **2024**, *Science of The Total Environment* (IF: 8.0)

[**meso-Substituted AB 3-type phenothiazinyl porphyrins and their indium and zinc complexes photosensitising properties, cytotoxicity and phototoxicity on ovarian cancer cells**](#)

B Balázs, B Stoean, É Molnár, E Fischer-Fodor, O Balacescu, **R Borlan**, M Focsan, A Grozav, P Achimas-Cadariu, G Emese, L Gaina; **2024**, *RSC Medicinal Chemistry* (IF: 3.6)

[**Advancing MRI with Magnetic Nanoparticles: A Comprehensive Review of Translational Research and Clinical Trials**](#)

R Lapusan, **R Borlan**, M Focsan; **2024**, *Nanoscale Advances* (IF: 4.6)

[**Discovery of New Hydrazone-Thiazole Polyphenolic Antioxidants through Computer-Aided Design and In Vitro Experimental Validation**](#)

G Marc, A Stana, M Tertis, C Cristea, A Ciorita, SM Dragan, VA Toma, R Borlan, M Focsan, A Pîrnău, L Vlase, S Oniga, O Oniga; **2023**, *International Journal of Molecular Sciences* (IF: 4.9)

[**No country for old antibiotics! Antimicrobial peptides \(AMPs\) as next-generation treatment for skin and soft tissue infection**](#)

M Raileanu, **R Borlan**, A Campu, L Janosi, I Turcu, M Focsan, M Bacalum; **2023**, *International Journal of Pharmaceutics* (IF: 5.3)

[**Albumin nanoparticles with tunable ultraviolet-to-red autofluorescence for label-free cell imaging and selective biosensing of copper ion**](#)

R Borlan, O Soritau, D Maniu, AM Hada, A Florea, S Astilean, M Focsan; **2023**, *International Journal of Biological Macromolecules* (IF: 7.7)

[**NIR photothermal-activable drug-conjugated microcapsules for in vitro targeted delivery and release: An alternative treatment of diabetic retinopathy**](#)

D Stoia, M Nistor, M Suci, **R Borlan**, A Campu, D Rugina, D Maniu, S Astilean, M Focsan; **2023**, *International Journal of Pharmaceutics* (IF: 5.3)

[Antioxidant Activity Evaluation and Assessment of the Binding Affinity to HSA of a New Catechol Hydrazinyl-Thiazole Derivative](#)

M Mic, A Pîrnău, CG Floare, **R Borlan**, M Focsan, O Oniga, M Bogdan, L Vlase, I Oniga, G Marc; **2022**, *Antioxidants* (IF: 7.0)

[NIR Fluorescence Captures Clear Images of Cancerous Tumors During Surgery](#)

R Borlan, M Focsan, S Astilean, P Achimas-Cadariu, **2021**, *Biophotonics Magazine*

[Fluorescent Phthalocyanine-Encapsulated Bovine Serum Albumin Nanoparticles: Their Deployment as Therapeutic Agents in the NIR Region](#)

R Borlan, D Stoia, L Gaina, A Campu, G Marc, M Perde-Schrepler, M Sillion, D Maniu, M Focsan, S Astilean; **2021**, *Molecules* (IF: 4.9)

[Antibody-functionalized theranostic protein nanoparticles for the synergistic deep red fluorescence imaging and multimodal therapy of ovarian cancer](#)

R Borlan, M Focsan, M Perde-Schrepler, O Soritau, A Campu, L Gaina, E Pall, B Pop, O Baldasici, C Gherman, D Stoia, D Maniu, S Astilean; **2021**, *Biomaterials Science* (IF: 7.6)

[Interventional NIR Fluorescence Imaging of Cancer: Review on Next Generation of Dye-Loaded Protein-Based Nanoparticles for Real-Time Feedback During Cancer Surgery](#)

R Borlan, M Focsan, D Maniu, S Astilean; **2021**, *International Journal of Nanomedicine* (IF: 7.0)

[Folic acid functionalized gold nanoclusters for enabling targeted fluorescence imaging of human ovarian cancer cells](#)

AM Hada, AM Craciun, M Focsan, **R Borlan**, O Soritau, M Todea, S Astilean; **2021**, *Talanta* (IF: 6.6)

[ICG-loaded gold nano-bipyramids with NIR activatable dual PTT-PDT therapeutic potential in melanoma cells](#)

A Campu, M Focsan, F Lerouge, **R Borlan**, L Tie, D Rugina, S Astilean; **2020**, *Colloids and Surfaces B: Biointerfaces* (IF: 5.3)

[Design of fluorophore-loaded human serum albumin nanoparticles for specific targeting of NIH:OVCA3 ovarian cancer cells](#)

R Borlan, AS Tatar, O Soritau, D Maniu, G Marc, A Florea, M Focsan, S Astilean; **2020**, *Nanotechnology* (IF: 3.9)

CONFERENCES AND SEMINARS

International Conferences - Oral Presentation

'From Imaging to Therapy: Curcumin-Functionalized Magnetic Nanoparticles for Dual MRI/Fluorescence Imaging and Photodynamic Therapy'

R Lapusan, A Balmus, S M Dragan, R Fechete, **R Borlan**, M Focsan; 15th International Conference Processes in Isotopes and Molecules, **2025**, Cluj, Romania

'Novel Hybrid Microcapsules for Targeted Delivery and Release of Therapeutic Molecules under NIR-Light Stimulation at Retina Level'

D Stoia, M Nistor, M Suci, **R Borlan**, A Campu, D Rugina, D Maniu, S Astilean and M Focsan; *Advanced Research Workshop (ARW) Biotechnology and Human Enhancement: Present Research and Future Perspectives*, **2023**, Latina, Italy

'Albumin Nanoparticles: A Versatile Approach for Sensing, Imaging, Treatment, and Targeted Delivery in Medicine'

R Borlan, O Soritau, E Pall, S Astilean and M Focsan; *4th International Conference on Nanomaterials for Health, Energy and the Environment*, **2023**, Caloundra, Australia

International Conferences - Poster Presentation

'Poly (Lactic-co-Glycolic Acid) Nanoparticles Encapsulating IR-783 fluorophore for NIR Imaging and Photothermal Therapy'

M Tudor, **R Borlan**, D Maniu, M Focsan; 15th International Conference Processes in Isotopes and Molecules, **2025**, Cluj, Romania

'Innovative Fabrication of Biocompatible Superparamagnetic Iron Oxide Nanoparticles for Enhanced Cancer Therapy'

R Borlan, R Lapusan, A Balmus, M Muntean and M Focsan; Regional Biophysics Conference & 15thGreta Pifat-Mrzljak International School of Biophysics, **2024**, Split, Croatia

'Exploring Biomedical Applications of BSA-Coated SPIONs Grafted with Curcumin: A Multimodal Approach for Targeted Cancer Therapy'

R Lapusan, **R Borlan**, O Soritau and M Focsan; Regional Biophysics Conference & 15thGreta Pifat-Mrzljak International School of Biophysics, **2024**, Split, Croatia

'Unveiling the Potential of Photothermal Therapy: NIR-797-Loaded PLGA Nanoparticles for Enhanced Cancer Treatment'

R Borlan, M Tudor, O Soritau, A Florea, S Astilean and M Focsan; 21st International Conference on Nanosciences & Nanotechnologies (NN24); 18th International Summer Schools on N&N OE & Nanomedicine (ISSON24), **2024**, Thessaloniki, Grece

'Tailored Therapeutics: BSA-Coated SPIONs Grafted with Curcumin for Advanced Cancer Therapy'

R Lapusan, **R Borlan**, A Balmus, M Muntean and M Focsan; 21st International Conference on Nanosciences & Nanotechnologies (NN24); 18th International Summer Schools on N&N OE & Nanomedicine (ISSON24), **2024**, Thessaloniki, Grece

'Magnetic Nanoparticles Coated with Albumin and Grafted with Curcumin as Innovative Theranostic Agents'

A Balmus, R Lapusan, **R Borlan**, M Muntean, O Soritau and M Focsan; *Analytical and Nanoanalytical Methods for Biomedical and Environmental Sciences*, **2024**, Brasov, Romania

'Novel smart wound patch: the next generation of wound dressing'

D Stoia, **R Borlan**, A Campu, F Zorila, M Alexandru, M Raileanu, M Bacalum and M Focsan; *14th International Conference Processes in Isotopes and Molecules*, **2023**, Cluj-Napoca, Romania

'Novel Hybrid Microcapsules for Targeted Delivery and NIR-light Stimulated Release of Therapeutic Molecules at Retina Level'

D Stoia, M Nistor, M Suci, **R Borlan**, A Campu, D Maniu, S Astilean and M Focsan; *6th Grandmaster Early-Career Workshop in Physics GEWP2023*, **2023**, Cluj-Napoca, Romania

'Fluorescent nanoparticles decorated with ovarian cancer-specific ligands as theranostic nanoagents for the deep red interventional imaging and multimodal therapy of cancer'

R Borlan, M Focsan, M Perde-Schrepler, L Gaina, D Maniu and S Astilean; *International school of nanomedicine, Workshop: advanced nano- and micro-structured materials for medical applications*, **2022**, Erice, Italy

'ICG-grafted albumin-coated magnetite nanoparticles for therapeutic and imagistic biomedical use'

R Lapusan, K Saszet, **R Borlan**, Z Pap, S Astilean, M Focsan; *International school of nanomedicine, Workshop: advanced nano- and micro-structured materials for medical applications*, **2022**, Erice, Italy

'Theranostic microcapsules for local resveratrol delivery and its potential laser release in retina cells'

R Pop, M Nistor, D Stoia, **R Borlan**, A Campu, A Pintea, M Focsan, D Rugina; *20th International Conference "Life Science for Sustainable Development*, **2021**, Cluj-Napoca, Romania

'Resveratrol-therapeutic agent delivered and localized via fluorescent polyelectrolyte microsystems inside living cells'

D Stoia, R Popan, M Nistor, **R Borlan**, D Rugina and M Focsan; *18th International Conference on Nanoscience & Nanotechnologies*, **2021**, Thessaloniki, Greece

'Indocyanine green-loaded protein nanoparticles for near infrared imaging and targeting of ovarian cancer cells'

R Borlan, AS Tatar, D Maniu, O Soritau, E Fischer, M Focsan, P Achimas-Cadariu and S Astilean; *18th European Conference on Spectroscopy of Biological Molecules*, **2019**, Dublin, Ireland

National Conferences - Oral presentation

'Development of microfluidic devices for thermoplasmonic applications'

M M Craciunescu, **R Borlan**, A Simion, M L de la Chapelle, M Focsan; *Sesiunea de Comunicări Științifice ale Studenților Facultății de Fizică*, **2025**, Cluj, Romania

'Design of protein-based nanoparticles loaded with FDA approved fluorophores for specific targeting of ovarian cancer cells'

R Borlan, A S Tatar, O Soritau, D Maniu, M Focsan, and S Astilean; *Conferinței Naționale a Doctoranzilor de la Facultățile de Fizica din cadrul Universităților din Consorțiul Universitaria*, **2020**, Iasi, Romania

'Sinteza și caracterizarea spectroscopică a unor nanoparticule proteice încărcate cu verde de indocianina pentru aplicații biomedicale'

R Borlan, A S Tatar, O Soritau, D Maniu, M Focsan, and S Astilean; *Conferinței Naționale a Doctoranzilor de la Facultățile de Fizica din cadrul Universităților din Consorțiul Universitaria*, **2019**, Bucharest, Romania

National Conferences - Poster presentation

'IR-783 Loaded Poly (Lactic-co-Glycolic Acid) Nanoparticles as Phototherapeutic and Fluorescent Contrast Agents'

D Damoc, M Tudor, **R Borlan**, D Maniu, S Astilean and M Focsan; *Sesiunea de Comunicări Științifice ale Studenților Facultății de Fizică*, **2025**, Cluj, Romania

'Magnetic Nanoparticles as MRI contrast and NIR-Induced Thermal Agents'

'Tunable Biosynthesized Gold Nanotriangles: Thermoplasmonic Performance via On-Demand Visible-NIR LED Activation'

O A Raducu, A Holca, A M Craciun, **R Borlan**, S Tripon, O Soritau, G Chereches, D Maniu, S Astilean, M L de la Chapelle, M Focsan; *Sesiunea de Comunicări Științifice ale Studenților Facultății de Fizică*, **2025**, Cluj, Romania

A Balmus, R Lapusan, **R Borlan**, M Focsan; *Sesiunea de Comunicări Științifice ale Studenților Facultății de Fizică*, **2025**, Cluj, Romania

'NIR-797 Loaded Poly (Lactic-co-Glycolic Acid) Nanoparticles as Phototherapeutic and Fluorescent Contrast Agents'

M Tudor, **R Borlan**, O Soritau, A Florea, S Astilean and M Focsan; *3rd International Conference on Bioengineering and Polymer Science*, **2023**, Bucharest, Romania

'NIR-797 loaded poly (lactic-co-glycolic acid) nanoparticles for in vitro fluorescence imaging'

M Tudor, **R Borlan**, M Nistor, D Rugina, S Astilean and M Focsan; *17th National Conference of Biophysics*, **2022**, Targu Mures, Romania