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Magdolna Casian

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Home: (Romania)

WORK EXPERIENCE

„Iuliu Haţieganu" University of Medicine and Pharmacy Cluj-Napoca – Cluj-Napoca, Romania

PhD Student Researcher

[01/2025 – Current]

- Project name: "*Aptamer-Based Technology for Therapy and Diagnosis of Liver Cancer*" (PN-IV-P1-PCE-2023-1104, contract no. 63PCE/03.01.2025), financed by National Plan for Research, Development, and Innovation 2022–2027, PNCDI IV, 5.1 – IDEAS Program: Exploratory Research Projects 2023
- Selection of aptamers by SELEX technology for hepatocellular carcinoma serum biomarker Golgi protein 73;
- Development of innovative electrochemical aptasensor platforms for Golgi protein 73 detection using in-lab selected and commercially available DNA aptamers;
- Development of aptamer-functionalized targeted delivery systems for hepatocellular carcinoma therapy.

Municipal Clinical Hospital Cluj-Napoca – Cluj-Napoca, Romania

Resident Pharmacist

[03/01/2022 – 31/12/2025]

- Completed theoretical and practical training modules as part of the General Pharmacy curriculum;
- Undertook practical training in both community and hospital pharmacy settings;
- Acquired hands-on experience in medication dispensing, patient counseling and pharmaceutical care;
- Applied pharmaceutical and biomedical knowledge to ensure safe, effective and optimal medication management and patient care.

Faculty of Pharmacy, „Iuliu Haţieganu" University of Medicine and Pharmacy Cluj-Napoca – Cluj-Napoca, Romania

Member of Analytical Chemistry and Instrumental Analysis Research Group

[03/2018 – Current]

- Theoretical and practical skills regarding electrochemical characterization methods (cyclic voltammetry, differential pulse voltammetry, electrochemical impedance spectroscopy);
- Development of an electrochemical aptasensor for the detection of tetracycline in real samples (residual water);
- Development of an aptamer-based electrochemical sensor for the detection of Ara h1 in real samples (milk, chocolate milk and biscuits);
- Theoretical and practical skills regarding aptamer selection through SELEX technology, DNA amplification by polymerase chain reaction (PCR), DNA fluorometric and UV-VIS spectroscopy quantification techniques, aptamer affinity characterization techniques (surface plasmon resonance and isothermal calorimetry);
- Aptamer selection for vancomycin using magnetic beads-based SELEX technology;
- Development of electrochemical aptasensors for therapeutic monitoring of antibiotic treatment in clinical settings.

Faculty of Pharmacy, „Iuliu Haţieganu" University of Medicine and Pharmacy Cluj-Napoca – Cluj-Napoca, Romania

Teaching Assistant

[01/10/2023 – 30/06/2025]

- Assisted in teaching and supervising Qualitative and Quantitative Analytical Chemistry laboratory classes for 1st and 2nd year Pharmacy students and Chemistry Fundamentals laboratory classes for 1st year Medical students;
- Guided students through practical experiments, reinforced theoretical concepts and ensured compliance with laboratory safety protocols;
- Provided feedback, evaluation and academic support to enhance students' understanding of core analytical chemistry principles.

Departamento de Química Física y Analítica, Facultad de Química, Universidad de Oviedo – Oviedo, Spain

Erasmus+ Mobility

[03/10/2022 – 01/10/2023]

- TA cloning technique: cloning of single-stranded DNA sequences selected for vancomycin using SELEX technology into plasmid vectors and insertion into *E. coli* cells;
- Sanger sequencing of selected oligonucleotides for vancomycin by SELEX technology for primary structure determination;
- Bioinformatic analysis: the use of bioinformatics programs for the analysis, alignment, and detection of recurrent motifs within the oligonucleotide sequences resulting from sequencing;
- Kinetic and affinity studies by Surface Plasmon Resonance (SPR) for aptamer affinity evaluation;
- Selection and characterization of an aptamer for a hepatocellular carcinoma tumor biomarker (glypican 3) through SELEX technology based on magnetic particles;
- Detection and amplification of DNA sequences by real-time quantitative PCR and endpoint PCR;
- DNA purification based on agarose gel separation.

University of Oslo – Oslo, Norway

Aurora Mobility

[26/03/2023 – 30/03/2023]

- Participation in the project entitled "Cooperation strategy for knowledge transfer, internationalization and curriculum innovation in the field of research education at the 3rd level of study - AURORA", funding contract no. 20–COP–0085 no. 4033/23.05.2019, with the aim of standardizing research methods and improving the knowledge of molecular biology.

University of Iceland – Reyjjavik, Iceland

Aurora Mobility

[28/11/2022 – 02/12/2022]

- Participation in the project entitled "Cooperation strategy for knowledge transfer, internationalization and curriculum innovation in the field of research education at the 3rd level of study - AURORA", funding contract no. 20–COP–0085 no. 4033/23.05.2019, with the aim of standardizing research methods and improving the knowledge of molecular biology.

Faculty of Pharmacy, „Iuliu Haţieganu" University of Medicine and Pharmacy Cluj-Napoca – Cluj-Napoca, Romania

Teaching Assistant

[10/2021 – 06/2022]

- Conducted practical laboratory activities with 1st year students from Faculty of Medicine (Chemistry Fundamentals), 1st year students from Faculty of Pharmacy (Qualitative Analytical Chemistry) and 2nd year students from Faculty of Pharmacy (Organic Chemistry);
- Provided clear demonstrations of laboratory techniques, including qualitative analysis, reagent handling, titration methods and fundamental organic synthesis procedures;
- Guided students in developing essential laboratory competencies and understanding theoretical concepts regarding analytical and organic chemistry;
- Developed strong laboratory management skills, including time management, workflow coordination and maintaining safe working environment;
- Strengthened ability to adapt teaching strategies to different learning styles and to explain complex chemical concepts in a clear and structured manner;
- Developed strong communication, mentoring and problem-solving skills through continuous interaction with academic staff and students;
- Evaluated student performance by checking lab reports, assessing experimental accuracy and providing constructive feedback to enhance learning outcomes.

"Ugo Schiff" Chemistry Department, University of Florence – Florence, Italy

Erasmus+ Mobility

[29/03/2021 – 28/05/2021]

- Development of an electrochemical sensor for the simultaneous detection of heavy metals (nickel and cobalt) from real samples;
- Assimilation of theoretical and practical aspects regarding square wave voltammetry (SWV);
- Screen-printed graphite electrode surface modification techniques *(in situ* vs *ex situ).*

EDUCATION AND TRAINING

Ph.D. in Chemistry - Field of Analytical Chemistry (Joint Thesis)

University of Oviedo [01/02/2022 – Current]

City: Oviedo | **Country:** Spain

Residency on General Pharmacy, Municipal Clinical Hospital Cluj-Napoca

[01/01/2022 – 31/12/2025]

City: Cluj-Napoca | **Country:** Romania

Ph.D. in Pharmacy - Field of Analytical Chemistry and Instrumental Analysis

"Iuliu Haţieganu" University of Medicine and Pharmacy Cluj-Napoca [01/10/2021 – Current]

City: Cluj-Napoca | **Country:** Romania

Bachelor's degree in Pharmacy

„Iuliu Haţieganu" University of Medicine and Pharmacy Cluj-Napoca [10/2016 – 09/2021]

City: Cluj-Napoca | **Country:** Romania

Baccalaureate degree

„Petru Maior" Theoretical High School [2012 – 2016]

City: Gherla | **Country:** Romania

LANGUAGE SKILLS

Mother tongue(s): Romanian | Hungarian

Other language(s):

English

LISTENING C1 **READING** C1 **WRITING** C1

SPOKEN PRODUCTION C1 **SPOKEN INTERACTION** C1

Levels: A1 and A2: Basic user; B1 and B2: Independent user; C1 and C2: Proficient user

SKILLS

Familiar with Microsoft Office package (Word, PowerPoint, Excel) / Adobe Lightroom Photo Editing / DNA Sequence Alignment and Analysis / Multiple Sequence Alignment / Primer-BLAST

DRIVING LICENCE

Driving Licence: B

COMPETENCES

Work related competences

- Ability to efficiently use the Nova (Metrohm Autolab) and PSTrace (Palmsense) software for electrochemical measurements;
- Theoretical and practical knowledge regarding the following laboratory techniques and equipments: PCR (Sensoquest Labcycler), UV-VIS spectrophotometer, Qubit fluorometer, SPR (Biosensing Instrument Bi-2500), Autolab potentiostat, E-Gel™ Power Snap Electrophoresis System (Applied Biosystem), Hitachi 3130xl Genetic Analyzer (Applied Biosystem);
- Data analysis using Origin data analysis and graphic software program and GraphPad Prism 9 software;
- Ability to use different DNA sequence analysis software (Bioedit biological sequence alignment editor, Clustal Omega, Galaxy, MEME Suite), respectively for DNA secondary structure prediction (UnaFold Web Server, VARNA, NUPACK: analysis and design of nucleic acid structures, devices and systems web server);
- Ability to process the material obtained through documentation in a well-structured, well-written and original work.

PUBLICATIONS

Publications

- M. Casian, O. Hosu-Stancioiu, I. Manea, D. Suárez, N. Díaz, M. J. Lobo Castañón, N. de los Santos Álvarez, C. Cristea. Disposable electrochemical aptasensor for rapid and selective vancomycin detection in clinical samples: Bridging affinity selection, computational modeling and clinical validation. Anal Chim Acta 1374 (**2025**) 344519. https://doi.org/10.1016/j.aca.2025.344519
- M. Casian, I. Manea, O. Hosu-Stancioiu, M. J. Lobo Castañón, N. de los Santos Álvarez, C. Cristea. Targeting hepatocellular carcinoma with aptamers: from biomarker detection to therapeutic applications, TRAC, Trends Anal. Chem 191 (**2025**)118346. https://doi.org/10.1016/j.trac.2025.118346
- M. Bibani[#], M. Casian[#], B. Feier, D. Bogdan, O. Hosu-Stancioiu, N. Ktari, R. Kalfat, C. Cristea. Electrochemical aptasensor for the selective detection of vancomycin based on nanostructured "in-lab" printed electrodes. Microchim Acta 192 (**2025**)107. https://doi.org/10.1007/s00604-025-06952-1 (# - authors with equal contribution)
- I. Manea, M. Casian, O. Hosu-Stancioiu, N. de los Santos Álvarez, M. J. Lobo Castañón, C. Cristea. A review on magnetic beads-based SELEX technologies: Applications from small to large target molecules. Anal Chim Acta. 1297 (**2024**) 342325. https://doi.org/10.1016/j.aca.2024.342325
- M. Casian, O. Hosu-Stancioiu, D. Ciobanu, D. Olaru, C. Cristea. Electrochemically assisted DNA and thioaromatic assembly as sensing and antifouling interface for food allergens. Microchim Acta 191 (**2024**) 97. https://doi.org/10.1007/s00604-023-06146-7
- O. Hosu, G. Melinte, G. Ștefan, M. Casian, C. Cristea. Towards selective tetracycline recognition in wastewater based on gold nanovoids@aptamer sensing, Electrochim. Acta 460 (**2023**) 142556. https://doi.org/10.1016/j.electacta.2023.142556
- A. Pusta, M. Casian, O. Hosu, M. Tertiș, C. Cristea. 16 - Microdevice-based aptamer sensors. In Aptamers Engineered Nanocarriers for Cancer Therapy, edited by Prashant Kesharwani, 367–402. Woodhead Publishing, **2023**. https://doi.org/10.1016/B978-0-323-85881-6.00006-3

DISSEMINATION

Oral presentations

- M. Casian, O. Hosu-Stancioiu, I. Manea, D. Suárez, N. Díaz, M. J. Lobo Castañón, N. de los Santos-Álvarez, C. Cristea. High-affinity aptamers for vancomycin monitoring in clinical samples by magnetic beads-based SELEX. 23rd International Symposium and Summer School on Bioanalysis,7th – 15th of July 2025, Zagreb, Croatia.
- M. Casian, O. Hosu-Stancioiu, M. J. Lobo Castañón, N. de los Santos-Álvarez, C. Cristea, Aptamer selection for assisted treatment of hepatocellular carcinoma, 22nd International Summer School on Bioanalysis, 7th – 13th of July 2024, Prague, Czech Republic.
- M. Casian, O. Hosu, M. J. Lobo Castañón, N. de los Santos Álvarez, C. Cristea. Aptamer selection targeting glypican 3 biomarker for aided screening and treatment of hepatocellular carcinoma. 19th edition of National Pharmacy Congress, 27th – 29th of September 2023, Cluj-Napoca, Romania.

[2022 – Current]

Poster presentations

- M. Casian, O. Hosu-Stancioiu, I. Manea, D. Suárez, N. Díaz, M.J. Lobo Castañón, N. de los Santos Álvarez, C. Cristea. Aptamer-based point-of-care monitoring of antibiotic treatment: from in-lab selection to electrochemical aptasensor development. Biosensors 2025,19th – 22nd of May 2025, Lisbon, Portugal.
- M. Casian, O. Hosu-Stancioiu, M.J. Lobo Castañón, N. de los Santos Álvarez, C. Cristea. *In vitro* selection of glypican-3 specific aptamers for active targeted drug delivery applications in hepatocellular carcinoma. Aptamers 2025, 14th – 15th of April 2025 (online).
- M. Casian, O. Hosu-Stancioiu, I. Manea, D. Suárez, N. Díaz, M. J. Lobo Castañón, N. de los Santos-Álvarez, C. Cristea. Personalized medicine for antibiotic treatment: aptamer selection for point-of-care electrochemical assessment, UMF University Days, 2nd–6th of December 2024, Cluj-Napoca, Romania.
- M. Casian, O. Hosu-Stancioiu, I. Manea, D. Suárez, N. Díaz, M. J. Lobo Castañón, N. de los Santos Álvarez, C. Cristea, DNA aptamer selection for personalized antibiotic treatment through point-of-care electrochemical sensor, ESEAC 2024, 23rd – 26th of July 2024, Ulm, Germany.
- M. Casian, O. Hosu-Stancioiu, D. Ciobanu, D. Olaru, C. Cristea, Fast and specific disposable electrochemical aptasensor for Ara h1 peanut allergen monitoring, ESEAC 2024, 23rd – 26th of July 2024, Ulm, Germany.
- M. Casian, O. Hosu-Stancioiu, I. Manea, D. Suárez, N. Díaz, M. J. Lobo Castañón, N. de los Santos Álvarez, C. Cristea, Magnetic beads SELEX technology: advancing aptamer selection towards personalized antibiotic treatment, Aptamers 2024, 17th – 20th of March 2024, Oxford, UK.
- M. Casian, O. Hosu, M. J. Lobo Castañón, N. de los Santos Álvarez, C. Cristea. Innovative strategies for glypican-3 biomarker targeting: aptamer selection for assisted treatment of hepatocellular carcinoma, UMF University Days, 4th – 8th of December 2023, Cluj-Napoca, Romania.
- M. Casian, O. Hosu, I. Manea, M. J. Lobo Castañón, N. de-los-Santos-Álvarez, C. Cristea, *In vitro* selection of aptamers against glycopeptide antibiotics and their evaluation for therapeutic monitoring applications, UMF University Days, 4th – 8th of December 2023, Cluj-Napoca, Romania.
- M. Casian, O. Hosu, D. Ciobanu, D. Olaru, C. Cristea. Mixed aptamer and thioaromatic coating as antifouling and specific interface for electrochemical-assisted monitoring of food allergy. 11th International Workshop on Surface Modification of Chemical and Biochemical Sensing, 3rd – 7th of November 2023, Łochów, Poland, **Audience Award for best poster presentation**.
- M. Casian, O. Hosu, C. Cristea, M. Jesús Lobo Castañón, N. de los Santos Álvarez. Selection of tumor surface biomarker-specific aptamer for targeted delivery nanosystem as innovative hepatocellular carcinoma treatment. I Ph.D. Multidisciplinary Chemical Congress, 19th – 20th of January 2023, Gijón, Spain, **Honorable mention award**.
- M. Casian, O. Hosu, D. Ciobanu, D. Olaru, C. Cristea. Label-free aptamer-based biosensor for the detection of peanut allergy-inducing protein Ara h1, UMF University Days, 5th – 9th of December 2022, **Best poster award - 2nd place**.

- M. Casian, O. Hosu, I. Manea, M. J. Lobo Castañón, N. de los Santos Álvarez. Magnetic beads SELEX technology: aptamer selection for hepatocellular carcinoma serum biomarker. UMF University Days, 5th – 9th of December 2022, Cluj-Napoca, Romania, **Best poster design award.**
- M. Casian, O. Hosu, I. Manea, M. J. Lobo Castañón, N. de los Santos Álvarez, C. Cristea. Selection, characterisation and use of protein Golgi 73-specific aptamer as a tool for early-stage diagnosis of hepatocellular cancer. Biosystems in Toxicology and Pharmacology – Current challenges, 8th – 9th of September 2022, online.
- M. Casian, O. Hosu, G. Ștefan, I. Manea, M. J. Lobo Castañón, N. de los Santos Álvarez, Cecilia Cristea. ssDNA aptamer selection for glycopeptide antibiotics. 20th International Symposium and Summer School on BioAnalysis, 24th – 30th of June 2022, Pécs, Hungary.

COMMUNICATION AND INTERPERSONAL SKILLS

Competences and social abilities

- Excellent written and verbal communication skills, with experience presenting scientific results to multidisciplinary teams;
- Strong ability to explain complex technical concepts clearly to both specialist and non-specialist audiences;
- Effective collaborator in research teams, promoting a positive and productive working environment;
- Skilled in active listening and providing constructive feedback during team discussions or project planning;
- Proven interpersonal skills through coordination with colleagues, supervisors, and external partners;
- Adaptable communication style, able to work efficiently with people from diverse backgrounds.

Organisation skills and competences

- Excellent time-management abilities, ensuring efficient planning and prioritization of tasks in fast-paced research environments;
- Skilled in coordinating project activities, documentation, and deadlines to support smooth workflow and team collaboration;
- Detail-oriented in managing laboratory materials, experimental schedules and data records with high accuracy and consistency.

PROFESSIONAL DEVELOPMENT

[01/2022 – Current]

Training curriculum in the speciality of General Pharmacy

- Training modules (Courses and practical laboratories): Pharmaceutical technology; Phytotherapy; Medical devices and nutritional supplements; Drug control; Pharmacy management; Applied informatics; Pharmacotherapy and drug interactions; Clinical pharmacy; Biopharmacy; Veterinary pharmacy; Homeopathy; Pharmaceutical marketing and marketing analysis; Medical emergencies; Publich health and medicines policy; Community pharmacy internship; Pharmaceutical regulatory affairs; Quality management, stardardization and logistics; Pharmacovigilance; Patient communication and counseling; Pharmacoeconomics; Enteral and parenteral nutrition; Radiopharmacy; Oncology pharmacy; Hospital pharmacy internship.

[10/2021 – 09/2022]

"Iuliu Haţieganu" University of Medicine and Pharmacy Cluj-Napoca Doctoral School Courses

- Courses: Scientific research methodology; Scientific research ethical notions; European legislation in research; Biotechnology; Scientific documentation; Scientometrics; Oral presentation and PowerPoint; Genetics and functional genomics in cancer; Sample preparation for proteomics - Practical course; Applications of nanomaterials and nanotechnologies in life sciences; Multivariate analysis of experimental data/ chemometrics; Experimental plans; Systematization and rationalization of experimental determinations in drug design, development and analysis; Modeling of pharmacokinetic processes; Applied electrochemistry; Bio- and immunosensors in pharmaceutical and biomedical analysis; Organic structural analysis by mass spectrometry.

[07/2023 – 11/2023]

PrecisMED Project Courses

- The PrecisMED project (*CNFIS-FDI-2023-0193*) aimed to develop "Iuliu Haţieganu" University of Medicine and Pharmacy Cluj-Napoca's capacity to support research, development and innovation activities in precision medicine by integrating data processing and analysis capabilities in a laboratory named Bioinformatics and Artificial Intelligence Applied in Medicine, as well as by initiating a student scientific group focused on this research direction.
- Courses performed: Bioinformatics; Learn Docking & Mol Dynamics Simulation, instructed by Muhammad Dujana, Udemy; Learn Bioinformatics from Scratch (Theory & Practical), instructed by Muhammad Dujana, Udemy; Python for Data Science and Machine Learning Bootcamp, instructed by Jose Portilla, Udemy; Sequencing analysis - Learn the use of BLAST, instructed by Sadaf Ambreen, Udemy.

Webinars

- Cell-based SPR Microscopy applications in drug discovery with Pfizer (26th of April 2022; Biosensing Instrument).
- The Journey from Neanderthal DNA to a Nobel Prize: How Dynabeads Magnetic Beads Contribute to Understanding Human Evolution. (31st of March 2023; Thermo Fischer Scientific Team and Labroots).

CONFERENCES AND MOBILITIES

Conferences

- 23rd International Symposium and Summer School on Bioanalysis, 7th – 15th of July 2025, Zagreb, Croatia;
- 35th Anniversary World Congress on Biosensors (Biosensors 2025), 19th – 22nd of May 2025, Lisbon, Portugal;
- Aptamers 2025 International Conference,14th – 15th of April 2025, Oxford, UK;
- 19th International Conference on Electroanalysis ESEAC 2024, 23rd – 26th of July 2024, Ulm, Germany;
- 22nd International Summer School on Bioanalysis 7th– 13th of July 2024, Prague, Czech Republic;
- Aptamers 2024 International Conference, 17th– 20th of March 2024, Oxford, England;
- 11th International Workshop on Surface Modification of Chemical and Biochemical Sensing, 3 rd-7th of November 2023, Łochów, Poland;
- I Ph.D. Multidisciplinary Chemical Congress, 19th – 20th of January 2023, Gijón, Spain;
- National Pharmacy Congress, 19th edition, 27th – 29th of September 2023, Cluj-Napoca, Romania;
- Biosystems in Toxicology and Pharmacology - Current challenges, 8th – 9th of September 2022, online event;
- Summer School "Food Safety and Healthy Living" FSHL 2022 (5th – 8th of September, 2022, Brașov, Romania);
- 20th International Symposium and Summer School on Bioanalysis (24th – 30th of June, 2022, Pécs, Hungary);
- Aptamers 2022 Conference, Oxford (4th – 5th of April, 2022, Oxford, UK).

Mobilities

- Short-term mobility (*no. M-RO-0010-2425-196965*) at Faculty of Science, University of Zagreb, Croatia, between 6th - 15th of July 2025, financed by Central European Exchange Programme for University Studies (CEEPUS);
- Short-term mobility (*no. M-RO-0010-2324-180269*) at Faculty of Science, Charles University, Prague, Czech Republic, between 7th - 13th of July 2024, financed by Central European Exchange Programme for University Studies (CEEPUS);
- Short-term mobility (*no. 20-COP-0085*) within the "Cooperation strategy for knowledge transfer, internationalization and curricula innovation in the field of research education at the 3rd level of study - AURORA" project at University of Iceland, Reykjavik, Iceland, between 28th of November - 2nd of December 2022 and at University of Oslo, Oslo, Norway between 26th - 30th of March 2023;
- Erasmus+ traineeship mobility (*contract no. 442/20.09.2022*) at Departamento de Química Física y Analítica, Facultad de Química, Universidad de Oviedo, Oviedo, Spain, between 3rd of October 2022 and 22th of September 2023;
- Short-term mobility (*no. M-RO-0010-16-2122-M-158686*) at Faculty of Sciences and Institute of Bioanalysis, Faculty of Medicine, University of Pécs, between 24th - 30th of June 2025, financed by Central European Exchange Programme for University Studies (CEEPUS);
- Erasmus+ traineeship mobility (*contract no. 17/05.03.2021*) at Dipartimento di Chimica 'Ugo Schiff, Università Degli Studi di Firenze, Florence, Italy, between 29th of March and 28th of May 2021.

05.01.2026