

# Alexandru Sonica

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**Gender:** Male

**Date of birth:** 15-12-2000

**Nationality:** Romanian

## EDUCATION

- 10/2025 – present **Doctoral studies (PhD)**  
Doctoral School of Chemistry
- 10/2023 – 7/2025 **Master of Science (MSc)**  
**Specialization:** Biochemical and Organic Process Engineering
- 10/2023 – 7/2025 **Master of Education (MEd)**  
**Specialization:** Chemical Education
- 10/2019 – 7/2023 **Bachelor of Science (BSc)**  
**Specialization:** Biochemical Engineering  
**Babes-Bolyai University, Faculty of Chemistry and Chemical Engineering** [chem.ubbcluj.ro](http://chem.ubbcluj.ro)  
Address: 11 Arany János st., RO-400028, Cluj-Napoca, Romania

## TRAINING

- 7/2025-10/2025 **Open data fellowship**  
**Babes-Bolyai University, Office for Open Science** [openscience.ubbcluj.ro](http://openscience.ubbcluj.ro)  
Address: 1 Mihail Kogalniceanu st., RO-400084 Cluj-Napoca, Romania
- Contributed to institutional open science initiatives by producing presentation materials and supporting university-wide promotion aimed at increasing visibility and uptake of UBB's Open Data platform.
- 4/2025 **Erasmus BIP: Zero Waste, Infinite Possibilities**  
**University of Almería** [ual.es](http://ual.es)  
Address: Sacramento rd., ES-04120, Almeria, Spain
- Co-developed and tested sustainable bioproducts by valorising shrimp shell waste through biotechnological methods such as enzymatic hydrolysis, microbial fermentation, and plant bioassays.
- 11/2024 **Innovation Challenges for Students: Discovery Week - CY Chapter**  
**CY Cergy Paris University** [eutopia-university.eu](http://eutopia-university.eu)  
Address: 33 bd. Port, FR-95000, Cergy, France
- Collaborated within interdisciplinary teams to tackle real-world challenges, pitched an entrepreneurial project
- 11/2022 **Education and Training Programme on Peaceful Uses of Chemistry for Youth**  
**Organisation for Prohibition of Chemical Weapons (OPCW)** [opcw.org](http://opcw.org)  
Address: B.P. 241, MA-14000, Kenitra, Morocco
- Introduction to chemical weapons, the Chemical Weapons Convention and the OPCW
  - Chemical safety and security, chemical risk assessment, incident management, ethics in chemistry, applications of dual-use chemicals

## RESEARCH EXPERIENCE

- 9/2023 – present **Graduate research**  
**Babes-Bolyai University, Faculty of Chemistry and Chemical Engineering** [chem.ubbcluj.ro](http://chem.ubbcluj.ro)  
Address: 11 Arany János st., RO-400028, Cluj-Napoca, Romania  
**Bioinorganic Chemistry**
- Expression and purification of various proteins and metalloproteins
  - Spectroscopic and computational studies of protein-ligand interactions
- 4/2024 – 5/2024 **University of Essex, School of Life Sciences** [essex.ac.uk](http://essex.ac.uk)  
Address: Wivenhoe Park, CO4 3SQ, Colchester, United Kingdom  
**Protein Structure and Mechanisms of Disease**
- Expression and purification of human hemoglobin from *E. coli*.
  - Protein crystallization; crystallization screening, optimization of crystallization conditions, use of multiple crystallization techniques (batch, hanging/sitting-drop, microseeding)

7/2020 – 7/2023 **Research internship**  
**National Institute for Research and Development of Isotopic and Molecular Technologies** [itim-cj.ro](http://itim-cj.ro)  
Address: 67-103 Donath st., RO-400293, Cluj-Napoca, Romania

**Porous Materials and Carbon Nanostructures**

- Synthesis of porous materials, metal/support catalysts; evaluation of catalytic activity in heterogeneous processes (CO<sub>2</sub> methanation, reduction of nitrobenzene)
- Data interpretation for by-powder X-ray diffraction, BET surface area analysis, thermogravimetric analysis, gas chromatography and electron microscopy (STEM)

3/2021 – 7/2023 **Undergraduate research**  
**Institute for Interdisciplinary Research in Bio-Nano-Sciences** [icibns.institute.ubbcluj.ro](http://icibns.institute.ubbcluj.ro)  
Address: 42 Treboniu Laurian st., RO-400271, Cluj-Napoca, Romania

**Nanostructured Materials and Bio-nano-interfaces**

- Preparation of biomaterials with applications in bone and skin tissue regeneration
- Record and interpret data for infrared spectroscopy (FT-IR) and X-ray diffraction (XRD) analysis

10/2019 – 10/2020 **Babes-Bolyai University, Faculty of Chemistry and Chemical Engineering** [chem.ubbcluj.ro](http://chem.ubbcluj.ro)  
Address: 11 Arany János st., RO-400028, Cluj-Napoca, Romania

**Supramolecular, Organic and Organometallic Chemistry**

- Synthesis of compounds bearing organic groups with possibilities of N→Se intramolecular coordination
- Structural analysis by using Nuclear Magnetic Resonance (<sup>1</sup>H, <sup>13</sup>C, <sup>77</sup>Se)

## VOLUNTEERING

10/2022 – 6/2023 **President**

9/2021 – 10/2022 **Secretary General**

**Chemistry Students' Organization** [osccluj.ro](http://osccluj.ro)

- Representing the NGO in all formal, official and legal contexts
- Organizing and supervising the activity of the administrative council and the project coordination teams
- Supervising and conducting administrative and financial activities

11/2025-10/2027 **Representative of Doctoral students in Faculty Council**

11/2023 – 10/2025 **Representative of Master's students in Faculty Council**

5/2021 – 10/2023 **Representative of Bachelor's students in Faculty Council**

**Students' Council of Babes-Bolyai University** [csubb.stud.ubbcluj.ro](http://csubb.stud.ubbcluj.ro)

- Advocating for student interest in Faculty Council; active in the research and competitiveness working group
- Being a member in student scholarship and housing committees, and evaluator of student research projects

## LANGUAGE SKILLS

**Native language:** Romanian

**Other languages:**

*English*

**LISTENING C1 READING C1 WRITING C1**

**SPOKEN PRODUCTION C1**

**SPOKEN INTERACTION C1**

*Spanish*

**LISTENING B1 READING B1 WRITING B1**

**SPOKEN PRODUCTION B1**

**SPOKEN INTERACTION B1**

## DIGITAL SKILLS

- Proficiency in Microsoft Office tools and data analysis software (Origin, MestreNova)
- Good command on the use of chemistry and bioinformatics software and tools (ChemOffice, pyMOL, Maestro, Turbomole, Autodock, ExPASy)
- Good command on the use of chemical engineering software (ChemCad, MATLAB, Solid Edge)
- Experience in working with scientific databases (WOS, Scopus, Reaxys, PDB, UniProt) and reference manager software (Mendeley, Zotero)

## MEMBERSHIPS

5/2024 – present Society of Biological Inorganic Chemistry

4/2024 – present American Association of Chemistry Teachers

4/2024 – present American Chemical Society

2/2020 – present Romanian Chemical Society

## AWARDS AND SCHOLARSHIPS

12/2023 – 12/2024

### World Federation of Scientists Scholarship

Scholarship awarded for the research project: 'Advancing the molecular interaction studies of hemoglobin with different classes of therapeutic agents'

5/2023

### Excellentia Award

Distinction by Babeş-Bolyai University for outstanding academic and extracurricular results

## PUBLICATIONS

### Articles

1. Valentová, J.; Humboldt, A.; Kocová, J.; Svitková, B.; Silaghi-Dumitrescu, R.; **Sonica, A.**; Schupp, T.; Gembický, M.; Nakashita, M.; Lester, K. R.; Baran, P., *Copper(II) Complexes with Schiff Bases Derived from 2-Pyridinecarbaldehyde N-oxide and Amino Acids: Studies on DNA, BSA Binding, Nuclease Activity, and Cytotoxicity*, *Chem. Eur. J.*, **2025**, e01578. <https://doi.org/10.1002/chem.202501578> (Cover Feature)
2. Lehene, M.; Simon, J.; Zagrean-Tuza, C.; Aghion, A.; Vasile, B.; **Sonica, A.**; Iancu, S.; Silaghi-Dumitrescu, R., *Oxygen-carrying proteins employed in blood substitute candidates: differences in interactions with a model antioxidant molecule*, *Biochim. Biophys. Acta, Proteins Proteomics* **2025**, 1873 (5), 141086. <https://doi.org/10.1016/j.bbapap.2025.141086>

### Conferences

1. **Sonica, A.**, Silaghi-Dumitrescu, R., *Interaction of small molecules with blood proteins* - poster, 17<sup>th</sup> New Trend in Chemistry Research (NewChemRes), 24-26<sup>th</sup> September 2025, Timisoara, Romania. *Poster prize on behalf of Romanian Chemical Society.*
2. **Sonica, A.**, Silaghi-Dumitrescu, R., *Interaction of small molecules with blood proteins* - poster, 14<sup>th</sup> International Conference on Protein Stabilization (ProStab), 21-24<sup>th</sup> September **2025**, Timisoara, Romania.
3. **Sonica, A.**, *Binding of biomedically relevant agents to hemoglobin* - oral presentation, 2<sup>nd</sup> European 360rg-Chem Challenge, 2<sup>nd</sup> December **2024**, Katowice, Poland.
4. **Sonica, A.**, Lehene, M., Silaghi-Dumitrescu, R., *Binding of biomedically relevant agents to hemoglobin* - oral presentation, 37<sup>th</sup> National Chemistry Conference, 24-27<sup>th</sup> September **2024**, Targoviste, Romania. *Presentation award on behalf of Romanian Chemical Society.*
5. **Sonica, A.**, Lehene, M., Silaghi-Dumitrescu, R., *Binding of biomedically relevant agents to hemoglobin* - poster, 17<sup>th</sup> European Biological Inorganic Chemistry Conference (EuroBIC-17), 25-29<sup>th</sup> August **2024**, Munster, Germany. *Poster prize on behalf of Springer Nature Publishing.*
6. Pop, M. M.\*, Boancă, F. P., **Sonica, A.**, Toma, V. A., Motoc, M. R., Di Lorenzo, T., Silaghi-Dumitrescu, R., *Insights into crustacean adaptations in the sulfidic mesothermal aquifer from Mangalia (Southern Dobrogea, Romania)*, 9<sup>th</sup> BIOTA Conference, 17-18 May **2024**, Cluj-Napoca, Romania.
7. **Sonica, A.**, Pop, L. C., Baia, L., Magyari, K., *Synthesis of chitosan composites with bioactive glass used in skin regeneration products* - oral presentation, 18<sup>th</sup> International Conference Students for Students, 6-9 April **2022**, Cluj-Napoca, Romania.
8. **Sonica, A.**, Miheţ, M., Grad, O., Turza, A., Porav, S., *MOF-Al<sub>2</sub>O<sub>3</sub> composites for catalytic applications* - oral presentation, 9<sup>th</sup> European Young Engineers Conference, 19-21 April **2021**, Warsaw, Poland.