

Curriculum Vitae

Name, first name: **Szabó László**

Date and place of birth: 15.04.1981, Cristuru Secuiesc, România

Marital status: married, three children

Languages spoken: Romanian, Hungarian and English

Website: http://atom.ubbcluj.ro/lzabo/pages/research_en.htm

Education:

Institution	Period	Degrees obtained
Faculty of Physics, Babeş-Bolyai University (BBU), Cluj-Napoca, Romania	2000-2009	BsC in Medical Physics, Master, PhD in Physics

Professional Experience:

Institution	Period	Pozition	Description
County Emergency Hospital Cluj-Napoca - IMOGEN Research Center	2022-present	Medical Physicist/Medical Imaging Laboratory	Experience in CT and MRI medical imaging, responsibilities with radiation protection
BBU, Faculty of Physics, Hungarian Line	2021-present	Associate Teaching Staff	Teaching activities, seminar activities, practical and laboratory work, supervision of the elaboration of bachelor's thesis, supervision of the elaboration of master's dissertations, other teaching, practical and scientific research activities included in the curricula, evaluation activities, tutoring, consultations, supervision of student scientific circles, students in the framework of the transferable credits system, participation in councils and committees in the interest of education.
County Emergency Hospital Cluj-Napoca - IMOGEN Research Center	2016-2020	Postdoc Researcher/Project Management	Experience in developing a medical imaging based tool to determine the origin of persistent atrial fibrillation and development of a contrast agent based on nanoparticles for magnetic resonance imaging. Experience in Project Management.
BBU, Faculty of Physics	2013-2016	Project Manager (grant TE_0227)	Experience in the development of novel conjugated nanoparticle for nanobiodetection of atherosclerosis and thrombosis by Surface Enhanced Spatial Offset Spatial Raman Spectroscopy (SESORS). Experience in Project Management.
"Niculae Stăncioiu" Heart Institute, Cluj-Napoca	2010-2022	Medical Physicist/Nuclear Medicine Laboratory	Experience in: nuclear physics, nuclear medicine, myocardial scintigraphy, radiation protection responsibilities
BBU, Faculty of Physics	2009-2012	Project Manager (grant PD_445)	Experience in development of new chemical sensors and biosensors based on optical methods. Experience in Project Management.
BBU, Faculty of Physics	2005-2009	PhD student	Spectroscopic and theoretical studies on molecular systems of pharmacological interest and cation recognition.

Experience in developing a nanoparticle-based contrast agent for magnetic resonance imaging [Iancu D, et al. *International Journal of Nanomedicine*, 15, 4811–4824, 2020], Structural studies on molecules of pharmacological interest, by IR, Raman, SERS, X-ray diffraction and NMR spectroscopic methods, correlated with theoretical calculations of DFT (Density Functional Theory), Experience in developing a medical imaging-based tool to determine the origin of persistent atrial fibrillation. [Manole S, et al. *Life* 1112 12 1362 (2021)].

Scientific research: Development of new contrast nanoparticles, structural studies on molecules of pharmacological interest, by IR, Raman, SERS, X-ray diffraction and NMR spectroscopic methods, correlated with theoretical calculations of DFT (Density Functional Theory); optical spectroscopy (IR, Raman, SERS, UV-VIS), DFT calculations, study of chemical sensors and biosensors, determination of chemical residues in complex matrices and development of new ultra-sensitive Raman sensors, SERS), for the detection and quantification of heavy metal ions at ng/l [¹Leopold N, et al. *J. Mol. Struct.* 919, 2009, 94; ²Szabo L, et al., *Spectrochim-ACTA-A*, 79, 2011, 226; ³Szabo L, et al., *CEJC*, 9, 2011, 410; ⁴Szabo L, et al., *Spectrochim-ACTA-A*, 93, 2012, 266; ⁵Szabo L, et al. *J. Mol. Struct.* 1073, 2014, 10]; development of new conjugated nanoparticle nanoparticles for nano-biodetection of atherosclerosis and thrombosis by Surface Enhanced Spatial Offset Spatial Offset Raman Spectroscopy (SESORS) [⁶Herman K, et al. *J. Applied Spectr.* 80, 2013, 311; ⁷Mircescu N, et al. *Anal. Bioanal. Chem.*, 406, 2014, 3051].

Patents:

1. Patent title: ***Process for obtaining nanoparticles with magnetite core and gold coating stabilized with glucose.***

Authors of the patent: Iancu D. Stefania, Moisoiu Vlad, Stefanu Andrei, Leopold Nicolae, Szabó László, Bálint Zoltán, Registration No. State Office for Inventions and Trademarks (OSIM): RO134304A0/ A 2019 00571 of 16.09.2019.

2. Patent title: ***Device for automatic detection and localization of fibrosis on cardiac MRI images***

Authors of the patent: Marginean Radu, Andreica Anca, Diosan Laura, Manole Simona, Popa Loredana, Szabó László, Bálint Zoltán, Registration No. State Office for Inventions and Trademarks (OSIM): RO135197A0/ A 2020 00551 of 02.09.2020

Relevant publications:

1. Tódor, István Sz; Marișca, Oana T; Rugină, Dumitrița; Diaconeasa, Zorița; Leopold, Loredana F; Coman, Cristina; Antonescu, Elisabeta; **Szabó, László**; Iancu, Stefania D; Bálint, Zoltán; Photothermal property assessment of gold nanoparticle assemblies obtained by hydroxylamine reduction, *COLLOID AND POLYMER SCIENCE*, 298 (10), 1369-1377 (2020). **IF: 1.931**

2. Ș. D. Iancu, C. Albu, L. Chiriac, R. Moldovan, A. Ștefanu, V. Moisoiu, V. Coman, **L. Szabo**, N. Leopold, Z. Bálint. Assessment of Gold-Coated Iron Oxide Nanoparticles as Negative T2 Contrast Agent in Small Animal MRI Studies, *INTERNATIONAL JOURNAL OF NANOMEDICINE* 15, 4811–4824, (2020). **IF: 5.115**

3. Tódor IS, **Szabó L**, Marișca OT, Chiș V, Leopold N, Gold nanoparticle assemblies of controllable size obtained by hydroxylamine reduction at room temperature, *J. OF NANO. RESEARCH* 16:(12) pp. 34-42. (2014). **IF: 2.278**

4. László Szabó, et al, SERS and DFT investigation of 1-(2-pyridylazo)-2-naphthol and its metal complexes with Al(III), Mn(II), Fe(III), Cu(II), Zn(II) and Pb(II), *SPECTROCHIMICA ACTA PART A-MOLECULAR AND BIOMOLECULAR SPECTROSCOPY* 93: pp. 266-273. (2012). **IF: 2.098**

5. K. Herman, **L. Szabó** et al, In-situ laser-induced photochemical silver substrate synthesis and sequential SERS detection in a flow cell, *ANALYTICAL AND BIOANALYTICAL CHEM.* 400:(3) pp. 815-820. (2011). **IF: 3.778**

6. K. Herman, **L. Szabó** et al, In situ silver spot preparation and on-plate surface-enhanced Raman scattering detection in thin layer chromatography separation, *JOURNAL OF APPLIED SPECTROSCOPY* 80 (2), 311-314 (2013). **IF: 2.087**

7. N. Leopold, S. Cintă-Pinzaru, **L. Szabó**, V. Chis, W. Kiefer, Raman and SERS study of metoclopramide at different pH values, *JOURNAL OF RAMAN SPECTROSCOPY* 41:(3) pp. 248-255. (2010). **IF: 3.137**

8. Manole Simona; Budurea Claudia; Pop Sorin; Iliescu Alin M; Ciortea Cristiana A; Iancu Stefania D; Popa Loredana; Coman Mihaela; **Szabó László**; Coman Vasile; Correlation between Volumes Determined by Echocardiography and Cardiac MRI in Controls and Atrial Fibrillation Patients; *Life* 1112 12 1362 (2021)

Experience in research projects:

Program/Project	Committee/Function	Period	Administered budget
CNCSIS-UEFISCDI PN-III-P4-ID-PCE-2020-1292/2022, <i>Nanobiotechnology based profiling and pulldown of cancer DNA and 2- hydroxyglutarate on cometabolite quantification in IDH-mutant malignancies</i> https://phys.ubbcluj.ro/~nicolae.leopold/pages/metdna.htm	Domain Applied Life Sciences and Biotechnologies/ Postdoctoral researcher	01.04.2022-31.12.2023	250.000 EUR
Imaging-Based, Non-Invasive Diagnosis of Persistent Atrial Fibrillation, Contract identification number: Grant Contract No: 23/01.09.2016, ID: P_37_245, MySMIS Code: 104004. www.imatfib.ro	Health Committee/ Postdoc Researcher/ Project Management	09.2016-09.2020	1.900.000 EUR
Experimental demonstrator based on Raman spectroscopy for quantification of glycated proteins in diabetes mellitus screening, project code PN-III-P2-2.1-PED-2019-3268/2020	Health Committee/ Postdoc Researcher	09.2020-09.2022	123.203 EUR
Development of a portable microfluidic device for rapid SERS detection of pathogens, project code PN-III-P2-2.1-PED-2016-0983/2017	Biotechnology Committee/ Postdoctoral Researcher	09.2017-02.2019	103.500 EUR
Nano-biosensors for atherosclerosis and thrombosis by Surface Enhanced Spatial Offset Raman Spectroscopy (SESORS), project code PNII-RU-TE-2012-3-0227/2013	Chemistry Committee / Project Director	04.2013-09.2016	162.000 EUR
Development of New Ultra-Sensitive Raman Sensors for the Detection and Quantification of Heavy Metal Ions, project code UEFISCDI PN II RU PD_445/2010	Physics Committee / Project Director	08.2010-07.2012	80.000 EUR
New approaches in the detection of chemical residues in complex matrices using TLC-SERS coupling: detection of melamine, antibiotics and pesticides in milk and milk powder, project code CNCSIS- UEFISCSU PN II RU RU TE_323/2010	Physics Committee / Postdoctoral Researcher	11.2010-10.2013	176.000 EUR
New on-line detection approaches for capillary electrophoresis and liquid chromatography using ultrasensitive Raman spectroscopy – SERS, cod proiect CNCSIS-UEFISCSU PN II RU RP 6/2008	Physics Committee / Doctoral Researcher	06.2008-12.2010	200.000 EUR
Spectroscopic and theoretical studies on molecular systems of biomedical interest, funded by CNCSIS (PN II IDEI ID_501)	Physics Committee / Doctoral Researcher	10.2007-09.2010	302.000 EUR
Molecular systems with applications in molecular electronics. Theoretical and experimental study, funded by CNCSIS (1485/2007)	Doctoral Researcher	2007-2009	60.400 EUR
Obtaining and characterization of new targeted nanomedicals with active substance of naphthoquinone (NANOQMED), funded by CNCSIS (PN II Partnerships 61-002/14.09.2007)	Physics Committee / Doctoral Researcher	2007-2010	30.200 EUR
High Performance Physical and Computational Methods in Nuclear Astrophysics and Applications to Radioactive Nuclei and Beams (ASTRO), funded by CNCSIS (PN II Parteneriate 71-112/14.09.2007)	Physics Committee / Doctoral Researcher	2007-2010	30.200 EUR

Natural computing of excellence, funded by CNCSIS (PN II IDEAS ID_543)	Doctoral Researcher	10.2007-09.2010	302.000 EUR
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Metrics: 33 publications in ISI journals [cumulative ISI factor 48.677], 8 articles in BDI indexed journals, participation in 45 international/national conferences with 71 papers (posters), H-index 14, 537 independent citations.

Google Scholar Profile: <https://scholar.google.com/citations?user=PySchJ4AAAAJ&hl=en>,

Researcher ID: B-9273-2012, <http://www.researcherid.com/rid/B-9273-2012>

Member in conference organizing committees:

- I) Biomedical and Imaging Approaches in the Management of Atrial Fibrillation, November 7-9 2019, Cluj-Napoca, România.
- II) 5th Advanced Spectroscopies on Biomedical and Nanostructured Systems, Cluj-Napoca, Romania, September 7-10, 2014.
- III) 4th COST Action CM0702: CUSPFEL, at the BBU, Cluj- Napoca, Romania, 21-23 March, 2012;
- IV) 31st EUCMOS 2012, at the BBU, Cluj-Napoca, Romania, August 26-31, 2012.
- V) 4th Advanced Spectroscopies on Biomedical and Nanostructured Systems (Kolozsvár), Romania, September 4-7, 2011.
- VI) 4th CEPAS, at the BBU, Cluj-Napoca, Romania, June 18-20, 2008.

Scientific and technical consultant at S.C. Embryo Projects S.R.L. period 01.03.2021-31.01.2022.

Reviewer for the following Journals: Spectrochim-ACTA-A (Elsevier), J. Mol. Struct. (Elsevier), Central European Journal of Chemistry (Versita, co-published with Springer Verlag), Studia Universitatis Babes-Bolyai Physica.

Member in professional associations:

Societatea Română de Fizică Medicală (SRFM) din 2024

Colegiul Fizicienilor Medicali din România (CFMR) din 2017.

Hungarian Academy of Sciences [HAS] (external public body member ID: 22299) since 2011.

Cluj-Napoca
24.03.2025



List of published papers

1. Manole Simona; Budurea Claudia; Pop Sorin; Iliescu Alin M; Ciortea Cristiana A; Iancu Stefania D; Popa Loredana; Coman Mihaela; **Szabó László**; Coman Vasile; *Correlation between Volumes Determined by Echocardiography and Cardiac MRI in Controls and Atrial Fibrillation Patients*; Life 1112 12 1362 (2021)
2. Iancu Stefania D; Albu Camelia; Chiriac Liviu; Moldovan Remus; Stefanu Andrei; Moisoiu Vlad; Coman Vasile; **Szabo Laszlo**; Leopold Nicolae; Bálint Zoltán; Assessment of gold-coated iron oxide nanoparticles as negative T2 contrast agent in small animal MRI studies; *International Journal of Nanomedicine* 15 4811 (2020)
3. Tódor István Sz; Marişca Oana T; Rugină Dumitrița; Diaconeasa Zorița; Leopold Loredana F; Coman Cristina; Antonescu Elisabeta; **Szabó László**; Iancu Stefania D; Bálint Zoltán; Photothermal property assessment of gold nanoparticle assemblies obtained by hydroxylamine reduction; *Colloid and Polymer Science* 29810 10 1369-1377 (2020)
4. **Szabo L**; Chis V; Pirnau A; Botond S; Cozar O; Orosz S; Theoretical and experimental study of Aripiprazole molecule; *Journal of optoelectronics and advanced materials* 93 3 599 (2007)
5. Cozar IB; Pîrnău A; **Szabo L**; Vedeanu N; Nastasă C; Spectroscopic and computational investigation of a thiazolidine-2 4-dione compound; *Romanian Reports in Physics* 682 2 630-641 (2016)
6. Cozar IB; Pîrnău A; **Szabo L**; Vedeanu N; NASTASĂ C; Cozar O; SPECTROSCOPIC AND DFT INVESTIGATION OF BENZALDEHYDE ISONICOTINO–HYDRAZIDE COMPOUND; *Rom. Journ. Phys* 61 (7-8) 1265-1275 (2016)
7. Leopold Loredana F; Coman Cristina; Todor Istvan Sz; **Szabo Laszlo**; Sorițău Olga; Virag Piroška; Miha Carmen M; Moisoiu Vlad; Leopold Nicolae; Raman imaging of dental follicle mesenchymal stem cells.; *Studia Universitatis Babes-Bolyai Physica* 602 2 (2015)
8. Tódor István Sz; **Szabó László**; Marişca Oana T; Chiş Vasile; Leopold Nicolae; Gold nanoparticle assemblies of controllable size obtained by hydroxylamine reduction at room temperature; *Journal of nanoparticle research* 1612 12 (1-8) (2014)
9. **Szabó László**; Herman Krisztian; Mircescu Nicoleta Elena; Tódor István Szabolcs; Simon Botond Lorand; Boitor Radu Alex; Leopold Nicolae; Chiş Vasile; Surface-enhanced Raman scattering and DFT investigation of 1 5-diphenylcarbazide and its metal complexes with Ca (II) Mn (II) Fe (III) and Cu (II); *Journal of Molecular Structure* 1073 (10-17) (2014)
10. Herman K; Mircescu NE; **Szabo L**; Leopold LF; Chiş V; Leopold N; In situ silver spot preparation and on-plate surface-enhanced Raman scattering detection in thin layer chromatography separation; *Journal of Applied Spectroscopy* 802 2 311-314 (2013)
11. **Szabó László**; Herman Krisztian; Mircescu Nicoleta E; Fălămaş Alexandra; Leopold Loredana F; Leopold Nicolae; Buzumurgă Claudia; Chiş Vasile; SERS and DFT investigation of 1-(2-pyridylazo)-2-naphthol and its metal complexes with Al (III) Mn (II) Fe (III) Cu (II) Zn (II) and Pb (II); *Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy* 93 266-273 (2012)
12. Cozar O; Bratu I; **Szabo L**; Cozar IB; Chiş V; David L; IR and ESR study of copper (II) complexes with ¹⁵N-labelled lysine and ornithine; *Journal of Molecular Structure* 993(1-3) (1-3) 397-403 (2011)

13. **Szabó L**; Herman K; Mircescu NE; Falamas A; Leopold LF; Leopold N; Chis V; VIBRATIONAL AND DFT STUDY OF CALCON AND ITS METAL COMPLEXES.; *Studia Universitatis Babes-Bolyai Physica* 562 2 (2011)
14. Bebu Andreea; **Szabó László**; Leopold Nicolae; Berindean Cătălin; David Leontin; IR Raman SERS and DFT study of amoxicillin; *Journal of Molecular Structure* 993(1-3) (1-3) 52-56 (2011)
15. Herman Krisztian; **Szabó László**; Leopold Loredana F; Chiş Vasile; Leopold Nicolae; In situ laser-induced photochemical silver substrate synthesis and sequential SERS detection in a flow cell; *Analytical and bioanalytical chemistry* 4003 3 815-820 (2011)
16. **Szabó László**; Herman Krisztian; Leopold Nicolae; Buzumurgă Claudia; Chiş Vasile; Surface-enhanced Raman scattering and DFT investigation of Eriochrome Black T metal chelating compound; *Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy* 791 1 226-231 (2011)
17. **Szabó László**; Leopold Loredana F; Cozar Bogdan I; Leopold Nicolae; Herman Krisztian; Chiş Vasile; SERS approach for Zn (II) detection in contaminated soil; *Central European Journal of Chemistry* 93 3 410-414 (2011)
19. Cozar IB; **Szabo L**; Leopold N; Chiş V; Cozar O; David L; IR Raman SERS and DFT study of pindolol and verapamil; *Journal of Molecular Structure* 993(1-3) (1-3) 308-315 (2011)
20. Cozar O; **Szabó L**; Cozar IB; Leopold N; David L; Căinap C; Chiş V; Spectroscopic and DFT study of atenolol and metoprolol and their copper complexes; *Journal of Molecular Structure* 993(1-3) (1-3) 357-366 (2011)
21. Cozar IB; **Szabó L**; Mare D; Leopold N; David L; Chiş V; IR Raman SERS and DFT study of paroxetine; *Journal of Molecular Structure* 993(1-3) (1-3) 243-248 (2011)
22. Leopold Nicolae; Cîntă-Pînzaru Simona; **Szabo Laszlo**; Ileşan Daniela; Chiş Vasile; Cozar Onuc; Kiefer Wolfgang; Raman and SERS study of metoclopramide at different pH values; *Journal of Raman Spectroscopy: An International Journal for Original Work in all Aspects of Raman Spectroscopy Including Higher Order Processes and also Brillouin and Rayleigh Scattering* 413 3 248-255 (2010)
23. Cozar IB; **Szabó L**; Leopold N; Chis V; David L; Raman SERS and DFT study of atenolol and metoprolol cardiovascular drugs; *Rom. J. Phys* 55(7-8) (7-8) 772-781 (2010)
24. Cozar IB; **Szabo L**; Mogonea L; Cozar O; David L; EPR investigation of two Cu (II) complexes with low symmetry; *Journal of Optoelectronics and Advanced Materials* 12(8-10) (8-10) 1799-1804 (2010)
25. Niculescu Violeta; Tamaian Radu; Păun Nadia; Pîrnău Adrian; **Szabo Laszlo**; Synthesis and spectral characterisation of a new metal complex with a bidentate ligand; *Journal of Physics: Conference Series* 1821 1 12030 (2009)
26. Leopold Nicolae; **Szabó László**; Pîrnău Adrian; Aluăş Mihaela; Leopold Loredana F; Chiş Vasile; Cozar Onuc; Raman spectroscopic and DFT theoretical study of 4-(2-pyridylazo) resorcinol and its complexes with zinc (II) and copper (II); *Journal of Molecular Structure* 919(1-3) (1-3) 94-99 (2009)
27. Pîrnău Adrian; Chiş Vasile; **Szabo Laszlo**; Cozar Onuc; Vasilescu Mihai; Oniga Ovidiu; Varga Richard A; Experimental and theoretical investigation of 5-para-nitro-benzylidene-thiazolidine-2-thione-4-one molecule; *Journal of Molecular Structure* 924 361-370 (2009)

28. **Szabo L**; Chiş V; Pîrnău A; Leopold N; Cozar O; Orosz Sz; Spectroscopic and theoretical study of amlodipine besylate; Journal of Molecular Structure 924 385-392 (2009)
29. Pîrnău Adrian; Chiş Vasile; Oniga Ovidiu; Leopold Nicolae; **Szabo Laszlo**; Baias Maria; Cozar Onuc; Vibrational and DFT study of 5-(3-pyridyl-methylidene)-thiazolidine-2-thione-4-one; Vibrational spectroscopy 482 2 289-296 (2008)
30. **Szabo L**; Chiş V; Pîrnău A; Leopold N; Cozar O; Orosz Sz; Spectroscopic and theoretical studies of dofetilide; Vibrational Spectroscopy 482 2 297-301 (2008)
31. Leopold N; Chiş V; Cozar IB; **Szabo L**; Pîrnău A; Cozar O; Raman SERS and DFT investigations of two metal-chelating compounds; OPTOELECTRONICS AND ADVANCED MATERIALS-RAPID COMMUNICATIONS 25 5 278-283 (2008)
32. Goga NO; Pîrnău A; **Szabo L**; Smeets R; Riediger D; Cozar O; Blumich B; Mobile NMR: applications to materials and biomedicine; Journal of Optoelectronics and Advanced Materials 84 4 1430 (2006)

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29.01.2025

Szabo Laszlo

