

PERSONAL INFORMATION

Alexander Bunge

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Sex m | Date of birth 06/08/1981 | Nationality German

POSITION

CS III

WORK EXPERIENCE

10/2012-present

Scientific researcher

I.N.C.D.T.I.M, Cluj-Napoca

- synthesis of organic and bioorganic compounds, analogues of natural compounds and polymers
- catalysis
- asymmetric catalysis
- synthesis and functionalization of magnetic (core-shell)-nanoparticles
- synthesis of polymers and hydrogels based on renewable materials
- analysis of compounds and nanoparticles using IR, (chiral) HPLC, UV-VIS, TEM/SEM/EDX, ICP-OES, (DLS, NMR, EA)

[Chemistry \(Research\)](#)

10/2012-12/2013

Scientific researcher (CS)

I.N.C.D.T.I.M Cluj-Napoca

10/2007-07/2011

Scientific researcher

Humboldt-Universität zu Berlin

- synthesis of organic and bioorganic compounds and analogues of natural compounds
- catalysis
- asymmetric catalysis
- chemistry of organic hydroperoxides and peroxides
- analysis of compounds and nanoparticles using NMR, IR, (HR)MS, (chiral) HPLC, CD
- supervision of students during their organic labwork
- supervision of students for their 4 week research practical
- administrator for the computers of the work group, as well as for the group website

[Chemistry \(Research\)](#)

EDUCATION AND TRAINING

10/2007-7/2011

Dr. rer. nat. (graduated magna cum laude)

Humboldt-Universität zu Berlin

- for a list of responsibilities see previous paragraph

10/2001-7/2007

Diplom (grade 1.3)

Humboldt-Universität zu Berlin , Chemistry (diploma in organic chemistry)

- investigation of a novel fragmentation reaction involving gem-dihydroperoxides
- separation and analysis of all products of this reaction
- on the base of this, development of a possible reaction mechanism

9/1994-6/2001 **Abitur** (grade 1.4)
 Heinrich-Hertz-Gymnasium Berlin, Germany
 ▪ Profile mathematics and chemistry

Mother tongue(s) German

Other language(s)	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken interaction	Spoken production	
English	C2	C2	C2	C2	C2
French	A2	A2	A2	A2	A2
Romanian	B2	B1	B1	B1	B1

Levels: A1/2: Basic user - B1/2: Independent user - C1/2 Proficient user
 Common European Framework of Reference for Languages

Communication skills
 ▪ good communication skills gained through experience working in teams on several projects
 ▪ very good teaching skills due to being responsible for teaching several students

Organisational / managerial skills
 ▪ leadership (responsible for supervising several students during their 4 week research practical, as well as several exchange students during their 1 year practical in our group)
 ▪ organisational skills, due to being part of the organization of a meeting of the FCHO (Förderverein Chemieolympiade)

Computer skills
 ▪ good command of Microsoft Office programs
 ▪ good command of programs specific for chemistry such as MestreC, EndNote, MDL Crossfire Commander/Reaxys, CAS SciFinder, ChemDraw, Diamond
 ▪ knowledge of maintaining a website
 ▪ knowledge of setting up and maintaining MS Windows systems
 ▪ knowledge of Pascal, limited knowledge of other programming languages (C, BASIC, Fortran, Assembly)

ADDITIONAL INFORMATION

- Publications
- "Reaction of Epoxyketones with Hydrogen Peroxide – Ethane -1,1-dihydroperoxide as a Surprisingly Stable Product",
 H.-J. Hamann, **A. Bunge**, J. Liebscher, *Chem. Eur. J.*, **2008**, *14*, 6849-6851
 - "A simple, efficient and versatile synthesis of primary *gem*-dihydroperoxides from aldehydes and hydrogen peroxide",
A. Bunge, H.-J. Hamann, J. Liebscher, *Tetrahedron Lett.*, **2009**, *50*, 524-526
 - "Enantioselective epoxidation of 2-substituted 1,4-naphthoquinones using *gem*-dihydroperoxides",
A. Bunge, H.-J. Hamann, E. McCalmont, J. Liebscher, *Tetrahedron Lett.*, **2009**, *50*, 4629-4632
 - "A New Dual Catalytic System for Asymmetric Morita-Baylis-Hillman Reaction",
 J. Shah, Z. Jacob, **A. Bunge**, J. Liebscher, *Synlett*, **2010**, 2079-2082
 - "Synthesis and antimalarial activity of new 1,2,4,5-tetroxanes and novel alkoxy-substituted 1,2,4,5-tetroxanes derived from primary *gem*-dihydroperoxides",
 H.-J. Hamann, M. Hecht, **A. Bunge**, M. Gogol, J. Liebscher, *Tetrahedron Lett.*, **2011**, *52*, 107-111
 - "Enantioselective epoxidation of tertiary allylic alcohols by chiral dihydroperoxides"
A. Bunge, H.-J. Hamann, D. Dietz, J. Liebscher, *Tetrahedron*, **2013**, *69*, 2446-2450

8. "Diazonium salt-mediated synthesis of new amino, hydroxy, propargyl, and maleinimido-containing superparamagnetic Fe@C nanoparticles as platforms for linking bio-entities or organocatalytic moieties", **A. Bunge**, L. Magerusan, I. Morjan, R. Turcu, G. Borodi, J. Liebscher, *J. Nanopart. Res.*, **2015**, 17(9), 379.
9. "Hybride Magnetic Nanostructure Based on Amino Acids Functionalized Polypyrrole", A. Nan, **A. Bunge**, R. Turcu, *Aip Conf. Proc.*, **2015**, 1700.
10. "Poly(benzofuran-co-arylacetic acid) - a new type of highly functionalized polymers", A. Nan, **A. Bunge**, M. Cîrcu, A. Petran, N. D. Hadade, X. Filip, *Polym. Chem.*, **2017**, 8(22), 3504-3514.
11. "Non-catalytic, solvent-free synthesis of poly(tartronic-co-glycolic acid) as a versatile coating for different surfaces", M. Cîrcu, **A. Bunge**, C. Vasilescu, S. Porav, A. Nan, *Polym. Int.*, **2018**, 67(2), 212-219.
12. "Correlation between synthesis parameters and properties of magnetite clusters prepared by solvothermal polyol method", **A. Bunge**, A. S. Porav, G. Borodi, T. Radu, A. Pîmău, C. Berghian-Grosan, R. Turcu, *J. Mater. Sci.*, **2019**, 54(4), 2853-2875.
13. "From high colloidal stability ferrofluids to magnetorheological fluids: tuning the flow behavior by magnetite nanoclusters", D. Susan-Resiga, V. Socoliuc, **A. Bunge**, R. Turcu, L. Vekas, *Smart Mater. Struct.* **2019**, 28(11), 115014.
14. "Raman spectra tell us so much more: Raman features and saturation magnetization for efficient analysis of manganese zinc ferrite nanoparticles", F. Nekvapil, **A. Bunge**, T. Radu, S. C. Pinzaru, R. Turcu, *J. Raman Spectrosc.*, **2020**, 51(6), 959-968.
15. "Single-cell Raman micro-spectroscopy for tracking of carotenoids in cyanobacteria exposed to Mn and Zn doped ferrite nanoparticles", F. Nekvapil, A. Bunge, L. B. Tudoran, S. C. Pinzaru, *Spectrochim Acta A*, **2021**, 254.
16. "Magnetic Nanoclusters Increase the Sensitivity of Lateral Flow Immunoassays for Protein Detection: Application to Pneumolysin as a Biomarker for Streptococcus pneumoniae", M. Salvador Fernández, J. L. Marqués Fernández, **A. Bunge**, J. C. Martínez-García, R. Turcu, D. Peddis, M. Del Mar García Suárez, M. D. Cima Cabal, M. Rivas, *Nanomaterials* **2022**, 12(12), 254.
17. "Substituted Poly(Vinylphosphonate) Coatings of Magnetite Nanoparticles and Clusters", **A. Bunge**, C. Leoștean, T. Radu, S.C. Tripon, G. Borodi, R. Turcu, *Magnetochemistry* **2022**, 8(8), 79.
18. "Characterization of the Lattice Transitions and Impurities in Manganese and Zinc Doped Ferrite Nanoparticles by Raman Spectroscopy and X-ray Diffraction (XRD)", F. Nekvapil, R. A. Bortnic, C. Leoștean, L. Barbu-Tudoran, **A. Bunge**, *Anal. Lett.* **2022**, 56(1), 42-52.
19. "Anticoagulant Properties of Coated Fe-Pd Ferromagnetic Shape Memory Ribbons" **A. Bunge**, A. Chiriac, M. Sofronie, I. Crăciunescu, A. S. Porav, R. Turcu, *Int. J. Mol. Sci.* **2023**, 24(3), 2452.
20. "Iridium-Based Nanohybrids: Synthesis, Characterization, Optical Limiting, and Nonlinear Optical Properties", N. Chazapis, M. Stavrou, G. Papaparaskeva, A. Bunge, R. Turcu, T. Krasia-Christoforou, S. Couris, *Nanomaterials* **2023**, 13(14), 2131.

Projects

member of the research team:

Geminale Dihydroperoxide als Sauerstoff-übertragende Reagenzien - DFG-Projekt

Metode avansate de sinteza a materialelor hibride – METAVASINT - AXA II, Operatiunea 2.1.2; 550/2010

Noi nanoparticule magnetice si aplicatiile acestora in organocataliza - PN II Resurse Umane TE; 100/2011

Hârtie securizată cu nanoparticule magnetice (NanoMagSecurityPaper) - PARTENERIATE IN DOMENIILE PRIORITARE; 280/2014

Sistem de etanșare cu nanofluid magnetic pentru viteze periferice mari (HiSpeedNanoMagSeal) - PARTENERIATE IN DOMENIILE PRIORITARE; 97/2014

Multifunctional Nanoparticles for Magnetic Hyperthermia and Indirect Radiation Therapy" (RADIOMAG) - COST

Poliesteri cu proprietati speciale pentru acoperirea suprafetelor solide cu aplicatii in medicina si nanotehnologie PN II Resurse Umane; TE 319/2015

Biocatalizator magnetic cu multistrat pentru sinteza in cicluri repetate a esterilor naturali PN-III-P2-2.1-PED-2016-0168

Noi metodologii de diagnosticare și tratament: provocări actuale și soluții tehnologice bazate pe nanomateriale și biomateriale, PN-III-P1-1.2-PCCDI-2017-0062, contract no. 58/2018

Dezvoltarea de radiofarmaceutice si tehnici nucleare în oncologie pentru imagistica și tratament personalizat la nivel molecular, PN-III-P1-1.2-PCCDI-2017-0769

Clusteri magnetici cu proprietăți controlate pentru dezvoltarea unor noi aplicații pentru separare magnetică și dispozitive magnetoreologice, Proiect "Cresterea capacitatii de transfer tehnologic si de cunostinte a INCDTIM Cluj - TTC-ITIM", contract nr. 18/01.09.2016, Contract subsidiar nr. 270/25.06.2018

Produse inovative prin exploatarea prafului de piatră rezultat ca deșeu în procesul de preparare a agregatelor, Proiect "Cresterea capacitatii de transfer tehnologic si de cunostinte a INCDTIM Cluj - TTC-ITIM", contract nr. 18/01.09.2016, Contract subsidiar nr. 298/08.10.2020

Polimeri inovativi cu conductivitate termică ajustabilă PN-III-P4-ID-PCE-2020-1595

Deșeuri industriale ca alternativă la fillerul din materialele bituminoase pentru colmatarea rosturilor din îmbrăcămințile rutiere: către o economie circulară PN-III-P2-2.1-PED-2021-1821

Analogi ai polidopaminei ca acoperiri fluorescente pentru nanoparticulele magnetice - PN-III-P1-1.1-TE-2021-0048

Validarea preclinică a prevenirii restenozei intrastent prin efectul cumulativ al particulelor nanocomposite magnetice funcționalizate și a stentului magnetic PN-III-P2-2.1-PED-2021-2049

- Conferences**
- Synthesefest 2009 München, Germany (Enantioselective epoxidation using *gem*-dihydroperoxides, **Alexander Bunge**, Hans-Jürgen Hamann, Eve McCalmont and Jürgen Liebscher; Reaction of epoxy ketones with hydrogen peroxide – Ethane-1,1-dihydroperoxide as a surprisingly stable product, Hans-Jürgen Hamann, **Alexander Bunge**, and Jürgen Liebscher)
 - ORCHEM 2010, Weimar, Germany (Synthesis of new 1,2,4,5-tetroxanes from primary *gem*-dihydroperoxides, Hans-Jürgen Hamann, **Alexander Bunge**, Mandy Hecht, Malgorzata Gogol and Jürgen Liebscher)
 - PIM 2015, Cluj-Napoca, Romania (Diazonium salt mediated synthesis of new functionalized Fe@C nanoparticles as platforms for linking bioentities or organocatalytic moieties, **Alexander Bunge**, Lidia Magerusan, Ion Morjan, Rodica Turcu, Jürgen Liebscher)
 - Nanotech Poland 2016, Poznan, (New magnetite core-shell nanoparticles for biomedical applications, **Alexander Bunge**, Teodora Radu, Alexandrina Nan, Rodica Turcu)
 - SIWAN7 2016, Szeged, Hungary, (Novel Polyester coatings for preparation of magnetic Core shell nanoparticles, **Alexander Bunge**, Monica Cîrcu, Teodora Radu, Xenia Filip, Alexandrina Nan)
 - PIM 2017, Cluj-Napoca, Romania (Correlation between relevant reaction parameters and properties of magnetite clusters produced by a solvothermal polyol process, **Alexander Bunge**, Sebastian Porav, Teodora Radu, George Borodhi and Rodica Turcu)
 - PIM 2019, Cluj-Napoca, Romania (Influence of reaction parameters on the properties of $Zn_xMn_{(1-x)}Fe_2O_4$ -nanoparticles synthesized by co-precipitation reaction, **Alexander Bunge**, Teodora Radu, George Borodi, Vlad Socoliuc, Alin Sebastian Porav, Rodica Turcu)
 - PIM 2021, Cluj-Napoca, Romania (Anticoagulant properties of coated Fe-Pd ferromagnetic shape memory ribbons, **Alexander Bunge**, Alexandru Chiriac, Mihaela Sofronie, Izabell Crăciunescu, Alin Sebastian Porav, Rodica Turcu)
 - PIM 2023, Cluj-Napoca, Romania (Synthesis of a magnetic sorbent only from waste materials, **Alexander Bunge**, Cristian Leostean, Rodica Turcu)
- Honours and awards**
- received two silver medals in the International Chemistry Olympics (Kopenhagen 2000 and Mumbai 2001)
- Memberships**
- member of the Studienstiftung des deutschen Volkes (Alumni)
 - Förderverein Chemieolympiade