Europass Curriculum Vitae

Personal information

First name(s) / Surname(s)	**Maria / Tomoaia-Cotisel**
Address(es)	Babes-Bolyai University of Cluj-Napoca, Kogalniceanu Str., no. 1, 400084 Cluj-Napoca (UBB)
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Nationality	Romanian
Date of birth	September 6, 1948
Gender	Female

Desired employment / Occupational field

University Professor, PhD supervisor, Scientific researcher (grade 1), Founder and Director of Physical Chemistry Center of Excellency/Teaching, Education, Research, Development and Innovation

Work experience

Dates: **2000- present**

Occupation or position held:

University Professor of Physical Chemistry, Biochemistry, Thermodynamics, Chemical structure, Biophysics, Nanoscience, Nanotechnology, Material science, Colloidal and Interface science, Nanostructured biomaterials with biological and medical applications.

University Professor at Doctoral School, Babes-Bolyai University of Cluj-Napoca (UBB), teaching the Course entitled *From Atoms, Molecules and Supramolecular Structures to Nanotechnology, Biology and Nanomedicine by Atomic Force Microscopy (AFM) and related modern techniques*

Ph. D. Supervisor, in the field of Chemistry, specialty: Physical Chemistry, Thermodynamics, Chemical Structure, Biophysics, Colloid and Surface Chemistry, Nanostructures, Biomaterials, Colloidal systems, Nanostructured Materials with biological, clinical and medical applications, at UBB, Physical Chemistry Center of Scientific Research Excellency.

2006 - present
Founder, Scientific Research Center in Physical Chemistry (2006)
Director, Scientific Research Center in Physical Chemistry (2006)
Center in Physical Chemistry was accredited in 2009

Excellency: Scientific Research Center of Excellency in Physical Chemistry (2010)
Research Center in Physical Chemistry was re-accredited in 2014; 2016

Main activities and responsibilities

Teaching activities in Physical Chemistry, Biochemistry, Biokinetics, Thermodynamics, Chemical structure, Biophysics, Nanoscience, Nanotechnology, Material science, Colloidal science, Modem technologies - the state of the art: level - AFM, STM, TEM, SEM imaging, LBT molecular and colloidal self - assemblies, DSC, advanced spectroscopy and related ones.

Projects management: project manager for research, development and innovation: 10 national projects, IDEI; PN2; CEEX, CNCSIS, Romanian Academy; one project at national and international level with World Bank; one project at European level through impact Program, ANCS and European Structural Funds; one international project; ERA- NET scheme, EuroNanomed**II,** EC's FP7, 2013;
-member of the research team for 2 national projects, and more than 20 national projects before 1999.
Leader for seven international academic and scientific collaborations between Babes-Bolyai University of Cluj-Napoca (UBB) and University of London, King's College, U.K., UBB and University of Marburg, Germany; UBB and University of Moldova, Chisinau, Republic of Moldova; UBB and Aristotle University of Thessaloniki, Greece; UBB and University of Paris South, Paris, France; UBB and SUNY at Buffalo, NY, USA; UBB and Molecular/Structural Biotechnology, NIH, Bethesda, MD, USA.

Scientific research in development and innovation for advanced nanostructured materials and applied drug delivery (e.g., transport vectors to the central nervous system through blood brain barrier)

International Patents: has four patents in the field of selective delivery systems for various biologically active components and drugs through the blood brain barrier to different regions of the central nervous system, namely: *Site-specific biomolecular complexes,* with specific biological and medical activity targetted to different zones of the human brain [**WO 96/04001 (A1)/ 1996** and **EP0952841 (A1)/1996];** *Method for delivering active agents to the human brain*, **US 5716614A/1998;** *Lipophilic-polycationic delivery systems,* **US 6005004 A/1999;** *Various carrier compositions for antitumor drugs and biologically active compounds,* **US 5925669 A/1999.** All patents were applied by pharmaceutical companies.

National patents: has one patent in the field of biologically active materials, namely: nano powders of hydroxyapatite and its substituted derivatives with medical applications and their fabrication procedure [**125817/2013**]. EURO-INVENT and PROINVENT: **Diploma Gold Medal**, 30 March 2012; PROINVENT: and Republica Moldova: **Diploma Medalia AGEPI,** 27-30 March 2012, Cluj-Napoca.

- preparation of intelligent (smart) *nano composites* similar to natural bone in structure and properties by innovative manufacturing processes and physical, chemical and biological characterization in cell culture of osteoblasts (bone forming cells); characterization by XRD, FTIR, NMR, DSC, TG, DTA, total surface area and porosity (BET method), zeta potential;
- preparation of *nano powders of calcium phosphates* and physical, chemical and biological characterization by XRD, FTIR, NMR, DSC, TG, DTA, total surface area and porosity (BET method), zeta potential;
- *metal nanoparticles of gold and silver* preparation, size characterization by TEM, SEM and AFM; zeta potential, UV-Viz spectroscopy and surface plasmon technique; their interactions with biomolecules, like amino acids, proteins and carbohydrates; their biological effects are characterized, regarding cell survival, migration, and growth
- gold nanoparticles are recently used for doxorubicin delivery to treat cervical cancer
- silver nanoparticles embedded into different carriers are used to kill various bacteria
- preparation of *nano structured biomaterials* made by self-assembly technique, layer by layer deposition, Langmuir-Blodgett assembly and physical and chemical characterization by FTIR; imaging techniques; NMR; calorimetry applied on biomaterials based on collagen and various nano powders;
- preparation and characterization of *collagen fibers* obtained by self-assemblies at the air-water interface or by deposition technique on solid surface from aqueous dispersion of collagen in the absence or in the presence of anti-cancer drugs, like 5-fluorouracyl and doxorubicin; pioneering work at national and international level; force distance curves and AFM images;
- preparation and characterization of various composite materials based on inorganic nano powders and different polymers, like chitosan or collagen
- preparation of *scaffolds made from nanostructured materials* and their biological characterization in cell culture media, in the presence of osteoblast cells; biophysical activity of osteoblasts is evaluated by cell collagen production and new bone development on the scaffold surface in cell culture
- *supramolecular associations* by molecular recognition between cyclodextrins and various biomolecules, such as quercetin or alpha lipoic acid;
- monolayers, vesicles and liposomes as membrane models;
-the interaction of red blood cells and procaine by AFM imaging techniques - pioneering work at national and international level;
- the physical, chemical and morphological characterization of *starch from potatoes and maize* used for packaging material preparation by green chemistry methods; thermal transformations within starch granules and their correlation with gelatinization characteristics in the advanced process of packaging material production.
- **10** Ph D thesis are finalized (40%: Excellent-Summa cum laude) and more are in progress

Name and address of employer	Babes-Bolyai University of Cluj-Napoca (UBB), Faculty of Chemistry and Chemical Engineering, Department of Chemical Engineering, Physical Chemistry Center
Type of business or sector	Education, Research, Development and Innovation, Governmental public sector
Dates	**1998 - 1999**
Occupation or position held	*Reader in Physical Chemistry*, at UBB, Physical Chemistry Department, Division of Thermodynamics, Biophysics, Colloid and Surface Chemistry, Chemistry applied in Biology, Thin films as membrane models and Biochemistry.
Main activities and responsibilities	*Teaching activities* in Physical Chemistry, Thermodynamics, Chemical structure, Biophysics, Nanoscience, Nanotechnology, Material science with applications in biology, Colloidal and Interfacial science; *Project management*: *project manager* for research, development and innovation in thin films as membrane models, national projects; drug biochemistry and biophysics; -preparation and characterization of lipid monolayers at the air-water interface; thin solid films of lipids and anesthetics; interfacial phenomena and their applications in anesthesia, Langmuir-Blodgett self-assembly of lipids; phase transition characterization; elastic properties
Name and address of employer	Babes-Bolyai University of Cluj-Napoca, Physical Chemistry Department (UBB)
Type of business or sector	Education, Research, Development and Innovation, Governmental public sector
Dates	**1989 - 1997**
Occupation or position held	*Associated Professor in Physical Chemistry* at UBB, Physical Chemistry Department
Main activities and responsibilities	Research and teaching activities in physical chemistry and biophysics through academic international cooperation between UBB and other prestigious Universities and Research Institutions; long term international collaboration.
Name and address of employer	Babes-Bolyai University of Cluj-Napoca, Physical Chemistry Department (UBB)
Type of business or sector	Education, Research, Development and Innovation, Governmental public sector
Dates	**1993- 1997**
Occupation or position held	Visiting scientist / visiting professor
Main activities and responsibilities	Research, development and innovation and teaching activities in physical chemistry and biophysics through academic international cooperation; director of the research and development (R & D) section, innovation and patent applications; drug delivery to the brain; drug development.
Name and address of employer	Molecular/structural Biotechnology, Bethesda, MD, USA
Type of business or sector	Research and teaching / Governmental public sector
Dates	**1991 - 1993**
Occupation or position held	Visiting scientist/ visiting professor
Main activities and responsibilities	Research, development and innovation and teaching activities in chemical physics and physical chemistry and biophysics, membrane research and development, through academic intemational cooperation; career perfection in biological systems; liposomal drug delivery systems; thermodynamics approach of interaction between drugs and liposomal membranes; unilamellar liposomes; multilamellar vesicles, DSC of main phase transition in lipidic (DPPC) dispersed systems; self-assembled monolayers at gas/liquid and liquid/liquid interfaces as membrane models, that offer selective methods of great practical significance for investigations in thermodynamics and biophysics of membranes and thin layers with industrial and medical applications, like medical devices and biosensors.
Name and address of employer	National Institutes of Health, NIH, Bethesda, MD, USA
Type of business or sector	Research and teaching / Governmental public sector
Dates	**1990 - 1991**
Occupation or position held	Visiting scientist/ visiting professor
Main activities and responsibilities	Research, development and innovation and teaching activities in physical chemistry, biochemistry and biophysics, membrane research and development, through academic international cooperation; a series of studies of nucleation and stability of thin films at fluid interfaces, that led to a kinetic model for quantitative investigations of relaxation phenomena and of collapse mechanism in oriented layers, Langmuir-Blodgett layers with sensor applications; innovative methods for calibration of lasers; nonlinear properties of carotenoid pigments.
Name and address of employer	State University of New York, SUNY, at Buffalo, Department of Chemistry and Photonics
Type of business or sector	Research and teaching / Governmental public sector
Dates	**1989 - 1990**

Occupation or position held	Humboldt visiting researcher
Main activities and responsibilities	Research, development and innovation and teaching activities in physical chemistry and biophysics, membrane and interfacial film research and development of thin layers of lipids and anesthetics, through academic international cooperation; developed new thermodynamic models of adsorption; biophysical characterization of surfactant self-assemblies in various media, containing electrolytes.
Name and address of employer	Philipps University of Marburg, Physical Chemistry Department, Marburg, Germany
Type of business or sector	Research and teaching / Governmental public sector
Dates	**June - September, 1989**
Occupation or position held	Visiting researcher/visiting professor
Main activities and responsibilities	Research, development and innovation in chemical physics, biochemistry, physical chemistry and biophysics, membrane research and development, through academic international long term cooperation and international contract between UBB and University of London on my Ph.D. thesis (since 1980).
Name and address of employer	King's College, Biochemistry and Biophysical Chemistry Departments, University of London, U.K.
Type of business or sector	Governmental and private sector, British Council fellowship.
Dates	**1984 - 1989**
Occupation or position held	Senior Lecturer in Physical Chemistry, Thermodynamics, Chemical Structure, Colloidal Chemistry and Interfacial Phenomena, Membrane science
Main activities and responsibilities	Research, development and innovation and teaching activities in physical chemistry, thermodynamics and chemical structure; membrane models at fluid interfaces; Marangoni instability; hydrodynamics of thin liquid films in microgravity conditions; research and development in thin films of biomolecules. *International contract* between UBB and NASA of USA **(1978-1985)** on "***The flow of liquid surfaces in the absence of gravity***", accepted by NASA to be implemented on spatial laboratories of Columbia. This contract was the first international contract of UBB.
Name and address of employer	Babes-Bolyai University of Cluj-Napoca, Faculty of Chemistry and Chemical Engineering, Physical Chemistry Department
Type of business or sector	Research and teaching / Governmental public sector
Dates	**June - September, 1986**
Occupation or position held	*Visiting researcher/visiting professor*
Main activities and responsibilities	Research and teaching activities in physical chemistry and biophysics through academic international cooperation; advanced studies on Langmuir monolayers of various lipids - extracted from natural membranes; surface pressure an surface potential measurements related with elasticity of self-assemblies of lipids at fluid interfaces. Collapse mechanisms in lipid films. Academic international *long-term cooperation and international contract* between UBB and University of London on my Ph.D. thesis (since 1980).
Name and address of employer	King's College, Biochemistry and Biophysical Chemistry Departments, University of London, London, U.K.
Type of business or sector	Education, Research, Governmental public and private sector; British Council fellowship.
Dates	**June - September, 1981**
Occupation or position held	*Postdoctoral appointment / Visiting researcher*
Main activities and responsibilities	Research activities in physical chemistry and biophysics of lipid membranes; *My Ph D thesis* was contracted by the University of London, through academic international cooperation between UBB and University of London (*first international contract* of UBB and long term collaboration with University of London, since 1980). Phase diagrams of thin lipid films at collapse. Relaxation phenomena in lipid thin films followed by interfacial tension measurements.
Name and address of employer	King's College, Biochemistry and Biophysical Chemistry Departments, University of London, London, U.K.
Type of business or sector	Education, Research, Governmental public and private sector
Dates	**1971 - 1984**
Occupation or position held	*Assistant Professor of Physical Chemistry*
Main activities and responsibilities	Research and teaching activities in physical chemistry, kinetics, chemical structure, quantum chemistry, thermodynamic, molecular structure and symmetry as well as colloid and surface chemistry. Developed new methods to measure surface tension with high precision at fluid interfaces. important results on the thin films of carotenoids at fluid interfaces, prepared by self-assembly Langmuir and Langmuir-Blodgett techniques are incorporated into my Ph. D. thesis.

Name and address of employer	Babes-Bolyai University of Cluj-Napoca, Faculty of Chemistry and Chemical Engineering, Physical Chemistry Department
Type of business or sector	Education, Research, Development and Innovation, Governmental public sector

Education and training

Dates	**1980**
Title of qualification awarded	**Ph.D. Diploma** in Chemistry, specialty in Physical Chemistry.
Principal subjects/occupational skills covered	Ph.D. Thesis on "The study of some films of natural pigments and lecithins", presented on December 12, 1979. Theoretical and experimental ability to build thin films of lecithins and carotenoids, as natural membranes models. Structural and thermodynamic characterization of spread Langmuir layers and adsorbed Gibbs layers at different interfaces. Developed new modern techniques, based on pendant drop method and Wilhelmy plate method, to measure surface tension with high precision at fluid interfaces in the presence of biomolecules. Thin films of carotenoids at fluid interfaces prepared by self-assembly Langmuir and Langmuir-Blodgett techniques. This work remains a *pioneering work* in the world community. *My Ph. D. thesis* is the basis of the first *international contract* between UBB and the University of London, and generated the academic international long term collaboration with University of London, since 1980.
Name and type of organisation providing education and training	Babes-Bolyai University of Cluj-Napoca, Faculty of Chemistry and Chemical Engineering, Arany J. Str., no. 11. 400028 Cluj-Napoca
Level in national or international classification	**ISCED 6**
Dates	**1966-1971**
Title of qualification awarded	Bachelor of Science, License Diploma (1971) in Chemistry; plus two years for specialty in Physical Chemistry
Principal subjects/occupational skills covered	Chemical science and physical chemistry / theoretical and experimental solid knowledge in thermodynamics and quantum chemistry as well as strong practical skills in kinetics approach of hydrolysis of organic molecules both in acid and basic medium.
Name and type of organisation providing education and training	Babes-Bolyai University of Cluj-Napoca, Faculty of Chemistry and Chemical Engineering, Arany J. Str., no. 11. 400028 Cluj-Napoca
Level in national or international classification	**ISCED 6**
Dates	**1962-1966**
Title of qualification awarded	High School, Baccalaureate, Diploma (1966); Theoretical Lyceum, mathematics and physics.
Principal subjects/occupational skills covered	Advanced knowledge of mathematics and physics as well as literature.

Personal skills and competences

2010: EU Expert evaluator for scientific research projects, European Structural Funds, in Prague, Czech Republic.
2011-2013: EU Expert evaluator and technical advisor for research projects**,** in Brussels, *Belgium*.

Mother tongue(s): Romanian

Other language(s)

Self-assessment	Understanding		Speaking		Writing
European level (*)	Listening	Reading	Spoken interaction	Spoken production	
English	C2	C2	C2	C2	C2
French	C1	C1	B2	B2	B1

(*) Common European Framework of Reference for Languages

Social skills and competences	Sociable; friendly personality; honest speaking; open mind; team work experience (planning, organizing, problems solver); communicative at work; large experience in working in national and international research teams. Excellent ability to adapt to multicultural environment; good leader; manager skills and ability; communication and public speech skills, gained from teaching activities and from participating in conferences and symposia or from different public events.
Organisational skills and competences	Problem-solving attitude; optimist and positive thinking person; extraordinary ability in science and teaching; ability to schedule and meet the deadlines for any type of activity, including project activities. Capable to manage various tasks in a given period of time; reliable person in a research team. Organizational skills gained from advisor for diploma projects.
Technical skills and competences	Valuable expertise in leading national projects and international collaborative scientific work; expert at national and international level in nanoscience, nanostructured materials, nano composites with high biologically effects, nanotechnology, material science; molecular and cellular biology, membrane models, drug design, drug transport carriers; efficient scientist both in theoretical field of physical chemistry and biophysics, and in experimental techniques, able to design medical devices based on sensing surfaces for amino acids and proteins, great skills to design new composites for bone substitutes; skills for experimental physical chemistry, biology and biochemistry.
Computer skills and competences	Editing: Microsoft word; Power point; Microsoft excel, Internet technology, Medline, Pub Med; Scopus.
Artistic skills and competences	Literature and music, both for leisure
Other skills and competences	- good manager leading well and efficiently the research team in stressful situations; responsible - **2001** '*Mini-Med School*", Certificate of Achievement awarded in recognition of successful completion, *NIH*, SUA.
Other skills and competences	- Important expertise in patent search and classification; ability to make inventions and writing patents - Scientific expert to evaluate project proposals at national and international levels - Scientific referee at national (Revue Roumaine Chimie, Studia, Babes-Bolyai University, Chemistry) and international peer review journals, *e.g.,* Journal of Colloid and Interface Science (USA), Colloids and Surfaces A: Physicochemical and Engineering Aspects (Elsevier), Colloids and Surfaces B. Biomembranes (Elsevier), Central European Journal of Chemistry, Annali di Chimica (Italy), Langmuir, Thin solid films (Elsevier), Materials Science and Engineering C, Biophysical Chemistry, Carbohydrate Polymer Journal, Journal of Applied Polymer Science, Physical Chemistry Journal (B and C), Particulate Science and Technology, Journal of Cluster Science, Journal of Medicinal Chemistry (ACS, USA), Journal of Applied Sciences (USA), J. Nanosci. Nanotechnol., ACS Nano, USA. - Member in many professional societies, several examples: Humboldt Association of Scientists in Transylvania, Romania, Humboldt Association of Scientists in North America, American Chemical Society, Romanian Physical Chemistry Association of Colloid and Surface Science, Romanian Physical Chemistry Association, American Biophysical Society, American Association for the Advancement of Science, Romanian Chemical Society, Romanian Society of Biomaterials, Romanian Society of Pure and Applied Biophysics. - Well recognized scientist and university professor in the scientific community.
Driving licence	No

Awards, honors, and other special scientific recognition
International (9) and national (1) prizes.

-1983: Prestigious Gheorghe Spacu Award of the Academy of Sciences in Romania for **"Physical chemistry of interfacial films"; scientific collaboration with NASA** of USA**;**

-1986: Prestigious Alexander von Humboldt *Fellowship*/Award (research program done in 1989/1990; specialty in biophysics, at the Philipps University of Marburg, Germany, for "Thermodynamics of adsorption and biophysical characterization of surfactant self-assemblies in various media, containing electrolytes".

-1988: *Meritorius Professorship Award of Japan Society for Promotion of Science and Technology* for "Molecular orientation and packing in the Surface lattice, supramolecular associations and thin films"

-1990: Visiting Professor/Scientist in State University of New York (SUNY) at Buffalo, USA, for ''A Series of studies of nucleation and stability of thin films at fluid interfaces, that led to a kinetic model for quantitative investigations of relaxation phenomena and of collapse mechanism in oriented layers"

-1991: *Prestigious Visiting Scientist Award of Fogarty, International Center at National Institutes of Health (NIH),* Bethesda, Maryland, USA, for 'Self-assembled monolayers at gas/liquid and liquid/liquid interfaces as membrane models, that offer selective methods of great practical significance for investigations in thermodynamics and biophysics of membranes and thin layers".

-1991: international Scientific Exchange Award from Natural Sciences and Engineering Research Council (NSERC) of Canada for "Surface characteristics of complex lipids extracted from ***Halobacterium cutirubrum".***

-1994: *International prize*, *Visiting Scientist of Extraordinary Ability*, obtained in USA.

-1981,1986,1989: **International Collaboration (joint studies and research**) (Post Doctoral and Visiting Professor Fellowship from British Council at University of London, King's College, U.K.; international contract since 1980).

-1987, 1989: *Curriculum Vitae* in "The International Register of Profiles", International Biographical Center, (CBI), Cambridge, UK, Vol. 9 (page 798) and // (page 697);

-1988: *Curriculum Vitae* in "Foremost Women of the Twentieth Century", International Biographical Center, (CBI), Cambridge, UK, First Edition, page 500;

-1988: *Curriculum Vitae* in "The World Who's Who of Women", International Biographical Center, (CBI), Cambridge, UK, First Edition, page 500.

-2009: *Curriculum Vitae* in "Who is Who", Enciclopedia Personalitatlilor din Romania,Ed.a4-a,Verlag fur Personenenzyklopadien, AG, CH-6304 Zug, Alpenstrasse 16 (2009).

- 1980- Agreement for scientific cooperation between “Babes-Bolyai” University of Cluj-Napoca and University of London, King’s College, U.K.

-2000 - Agreement for scientific cooperation between “Babes-Bolyai” University of Cluj-Napoca and “Aristotle” University of Thessaloniki, Greece.

-2000- Agreement for scientific cooperation between “Babes-Bolyai” University of Cluj-Napoca and University of Leipzig, Germany.

-**2005- Agreement** for scientific cooperation between “Babes-Bolyai” University of Cluj-Napoca and Philipps University of Marburg, Germany.

-**2005- Joint research project** with University of Paris South, Paris, France

-**2005- Joint research project** with “Aristotle” University of Thessaloniki, Greece.

Additional information

♦ **In the last 10 years: over 120 publications; 11 books; over 110 invited lectures, 15 Plenary lectures and 20 Keynote speeches, and seminars at prestigious Universities and research Institutions or Symposia, Congresses and Conferences**

♦ **http://www.chem.ubbcluj.ro/romana/ANEX/cf/pcas/index.htm**

♦ **Some examples of papers ISI, as first or corresponding author:**

1) A. Mocanu, O. Cadar, P.T. Frangopol, I. Petean, Gh.Tomoaia, G.A. Paltinean, Cs. P. Racz, O. Horovitz and M. Tomoaia-Cotisel, "Ion release from hydroxyapatite and substituted hydroxyapatites in different immersion liquids: *in vitro* experiments and theoretical modelling study", *Royal Society Open Science,* 8: 201785(2021).

2) C. Garbo, J. Locs, M. D'Este, G. Demazeau, A. Mocanu, C. Roman, O. Horovitz, M. Tomoaia-Cotisel, Advanced Mg, Zn, Sr, Si multi-substituted hydroxyapatites for bone regeneration, Int J Nanomed, **15**, 1037- 1058 (2020).

3) A. Avram, M. Gorea, S. Rapuntean, A. Mocanu, G.A. Paltinean, Cs. Varhelyi, Jr., I Petean, O. Horovitz, M. Tomoaia-Cotisel, In-vitro antibacterial activity of novel nanostructured composites based on forsterite and silver nanoparticles, Rev Chim (Bucharest), **71**(1), 13-21 (2020).

4) D. Oltean-Dan, G.B. Dogaru, M. Tomoaia-Cotisel, D. Apostu, A. Mester, H.R.C. Benea, M.G. Paiusan, E.M. Jianu, A. Mocanu, R. Balint, C.O. Popa, C. Berce, G.I. Bodizs, A.M. Toader, Gh. Tomoaia, Enhancement of bone consolidation using high frequency pulsed electromagnetic short-waves and titanium implants coated with biomimetic composite embedded into PLA matrix: in vivo evaluation, Int J Nanomed, **14**, 5799 (2019).

5) G. Furtos, M. A. Naghiu, H. Declercq, M. Gorea, C. Prejmerean, O. Pana, M. Tomoaia-Cotisel, "Nano forsterite biocomposites for medical applications: Mechanical properties and bioactivity", *J. Biomed. Mater. Res. Part B*, **104**(7), 1290-1301 (2016).

6) Gh. Tomoaia, O. Horovitz, A. Mocanu, A. Nita, A. Avram, C.P. Racz, O. Soritau, M. Cenariu, M. Tomoaia-Cotisel, "Effects of doxorubicin mediated by gold nanoparticles and resveratrol in two human cervical tumor cell lines", *Col-SUB*, **135**, 726-734 (2015).

7) A. Mocanu, G. Furtos, S. Rapuntean, O. Horovitz, C. Flore, C. Garbo, A. Danisteanu, Gh. Rapuntean, C. Prejmerean, M. Tomoaia-Cotisel,"Synthesis; characterization and antimicrobial effects of composites based on multi-substituted hydroxyapatite and silver nanoparticles", *Applied Surface Science* (App. Surf. Sci.), **298**, 225–235 (2014).

8) Gh. Tomoaia, A. Mocanu, I. Vida-Simiti, N. Jumate, L.-D. Bobos, O. Soritau, M. Tomoaia-Cotisel, "Silicon effect on the composition and structure of nanocalcium phosphates. In vitro biocompatibility to human osteoblasts", *Materials Science and Engineering* C, **37**, 37–47 (2014).

9) M.-A. Naghiu, M. Gorea, E. Mutch, F. Kristaly, M. Tomoaia-Cotisel, "Forsterite nanopowder: structural characterisation and biocompatibility evaluation", *Journal of Material Science and Technology (**JMST**)*, *J. Mater. Sci. Technol*., **29**(7), 628-632 (2013).

10) A. Mocanu, R.D. Pasca, Gh. Tomoaia, C. Garbo, P. T. Frangopol, O. Horovitz and M. Tomoaia-Cotisel, "New procedure to synthesize silver nanoparticles and their interaction with local anesthetics", *Int. J. Nanomedicine*, **8,** 3867-3874 (2013).

11) Cs-P. Racz, Sz. Santa, M. Tomoaia-Cotisel**,** Gh. Borodi, I. Kacso, A. Pirnau and I. Bratu, "Inclusion of α-lipoic acid in β-cyclodextrin. Physical-chemical and structural characterization", *J. of Incls. Phenomena and Macrocyclic Chem.,* **76**(1), 193-199 (2013)**.**

12) Gh. Tomoaia, O. Soritau, M. Tomoaia-Cotisel, L.-B. Pop, A. Pop, A. Mocanu, O. Horovitz and L.-D. Bobos, "Scaffolds made of nanostructured phosphates, collagen and chitosan for cell culture", *Powder Technology,* **238,** 99-107 (2013).

13) Cs. P. Rácz, G. Borodi, M.M. Pop, I. Kacso, S. Santa, M. Tomoaia-Cotisel, "Structure of the inclusion complex of β-cyclodextrin with lipoic acid from laboratory powder diffraction data", *Acta Cryst.,* B**68**, 164-170 (2012).

14) U.V. Zdrenghea, Gh. Tomoaia, D.-V. Pop-Toader, A. Mocanu, O. Horovitz and M. Tomoaia-Cotisel, "Procaine effect on human erythrocyte membrane explored by atomic force microscopy", *Combinatoial Chemistry & High Throughput Screening*, **14** (4), 237 -247 (2011).

15) Gh. Tomoaia, P. T. Frangopol, O. Horovitz, L.-D. Bobos, A. Mocanu and M. Tomoaia-Cotisel, "The effect of arginine on gold nanoparticles in colloidal solutions and in thin films", *Journal of Nanoscience and Nanotechnology*, **11**, 77 62-7 77 0 (2011).

16) A. Avranas, A, Konstantinou, A. Mocanu and M. Tomoaia-Cotisel, "Adsorption of procaine at the mercury/electrolyte solution interface", *Colloids and Surfaces A: Physicochem*. Eng. Aspects,**332**, 36-42 (2009).

17) A. Mocanu, I. Cernica, Gh. Tomoaia, L.-D. Bobos, O. Horovitz and M. Tomoaia-Cotisel, "Self-assembly characteristics of gold nanoparticles in the presence of cysteine", *Colloids and Surfaces A*: Physicochem, Eng, Aspecfs, **338**, 93-1 01 (2009).

Additional information

Over 50 scientific papers were published in collaboration with foreign scientists from UK (27 papers), USA (9 papers and 4 patents), Germany (2 papers), Japan (1 paper), Belgium (3 papers), Switzerland (1 paper), France (1 paper), Latvia (1 paper), Canada (2 papers) and Greece (6 papers).

♦ **Selected ISI Papers published in collaboration with foreign scientists:**

18) P. J. Quinn, M. Kates, J. F. Tocanne and M. Tomoaia-Cotisel, "Surface characteristics of phosphatidylglycerol phosphate from the exheme halophile Halobacteium cutirubrum compared with those of its deoxy analogue at the air/water interface", *Biochem.J.*, **261**,377-381 (1989).

19) M. Tomoaia.Cotisel, J. Zsako, E. Chifu and P. J. Quinn, "Intermolecular interactions in lipid and carotenoid monolayers", Biochem. J., **248**, 877-882 (1987).

20) M. Tomoaia-Cotisel, A. Sen and P. J. Quinn, "Surface active properties of 1,2-distearoylgalactosylglycerols", J. Colloid Inbrtace Scr., **94**, 390-398 (1983).

21) P. Joos, A. Tomoaia-Cotisel, A. J. Sellers and M. Tomoaia-Cotisel, "Adsorption kinetics of some carotenoids at the oil/water interface", *Colloids and Surfaces. B. Biointerfaces*, **37**, 83-91 (2004).

22) O. Horovitz, Gh. Tomoaia, A. Mocanu, T. Yupsanis and M. Tomoaia-Cotisel, "Protein binding to gold colloids", *Gold Bulletin*, **40** (3), 213-218 (2007).

23) O. Horovitz, Gh. Tomoaia, A. Mocanu, T. Yupsanis and M. Tomoaia-Cotisel, "Protein binding to gold auto-assembled films", *Gold Bulletin*, **40** (4), 295-304 (2007).

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M.Tomoaia-Cotisel and P.J.Quinn, "Chapter 10: Biophysical Properties of Carotenoids" in "Subcellular Biochemistry, VoL **30**: Fat-Soluble Vitamins" Editors: P.J. Quinn and V. Kagan, Plenum Press, New York, 1998, pp.219-242; this monograph is hold at many well known universities (e.g., King's College, Imperial College, Chelsea College, University of London, Philipps University of Marburg, Stanford University, Harvard University, George Town University, George Washington University, Johns Hopkins University, Pennsylvania University, Cambridge University and research institutes (e.g., NIH).

♦ **Hirsch index is 25, i10-index 70,** in Google Scholar,
♦ **Total Citations** are **2669** in Google Scholar

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Additional information

- **Books and contributions to books (19 books)**

1) M. Tomoaia-Cotisel**,** I. Albu şi E. Chifu, "Termodinamica Chimică", Presa Universitară Clujeană*,* Cluj-Napoca, **2009**, pp. 240, **ISBN: 978- 973-610-892-1.**

2) M. Tomoaia-Cotisel, I. Albu şi E. Chifu, "Termodinamica Chimică", *Editia a II-a, revăzută şi adăugită*, Presa Universitară Clujeană, Cluj-Napoca, **2009**; pp. 272, **ISBN: 978-973-610-941-6.**

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7) E. Chifu, M. Tomoaia-Cotisel**,** I. Albu, A. Mocanu, M.-I. Salajan, Cs. Racz si V.D. Pop, *"Metode Experimentale in Chimia si Biofizica Coloizilor si a Interfetelor"*, Presa Universitară Clujeană*,* Cluj-Napoca, **2004,** pp. 175**; ISBN: 973-610-242-4.**

8) J. Zsako si M. Tomoaia-Cotisel, *"Simetria si Structura Moleculara"*, Presa Universitară Clujeană*,* Cluj-Napoca, **1998;** pp. 255; **ISBN: 973-9354-60-2.**

9) E. Chifu, *"Chimia Coloizilor si a Interfetelor"*, Editori: M. Tomoaia-Cotisel, I. Albu, A. Mocanu, M. Salajan, E. Gavrila si Cs. Racz, Presa Universitară Clujeană*,* Cluj-Napoca, **2000,** pp. 393 **; ISBN: 973-8095-08-5.**

10) M. Tomoaia-Cotisel and P.J. Quinn, "*Chapter **10**: Biophysical Properties of Carotenoids" in "Subcellular Biochemistry, Vol. 30: Fat-Soluble Vitamins*" Editors: P.J. Quinn and V. Kagan, *Plenum Press*, New York, **1998**, pp. 219-242. **ISBN: 0-306-45846-2.**

11) E. Chifu and **M. Tomoaia-Cotişel**, "Carotenoid films at the air/water interface", in "*Surfactants in Solution",* (K. L. Mittal and B. Lindman, Eds.), **Vol. 2**, Plenum Press, New York, 1984, pp. 1349-1364.

12) M. Tomoaia-Cotişel, E. Chifu and J. Zsakó, "The structure of some lecithin monolayers at the air/water interface", in "*Water and Ions in Biological Systems",* (A. Pullman, V. Vasilescu and L. Packer, Eds.), Plenum Press, New York, 1985, pp. 243-250.

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17) M. Tomoaia-Cotisel, "The nanostructure formation of the globular seed storage protein on different solid surfaces studied by atomic force microscopy", in *Convergence of Micro-Nano-Biotechnologies*, Series in *Micro and Nanoengineering*, ***Volume* 9**, *Editors*: Maria Zaharescu, Emil Burzo, Lucia Dumitru, Irina Kleps and Dan Dascalu, Romanian Academy Press, Bucharest, **2006**, pp. 147 - 161. ISBN: (10) 973-27-1422-0.

18) A. Mocanu, Gh. Tomoaia, C.-R. Ispas, O.-C. Borostean, D. Dubert, V.-D. Pop, L. Bobos and M. Tomoaia-Cotisel, "Two-dimensional nanostructures of dimyristoyl phosphatidylcholine and cholesterol at different interfaces", in *Convergence of Micro-Nano-Biotechnologies*, Series in *Micro and Nanoengineering*, ***Volume* 9**, *Editors*: Maria Zaharescu, Emil Burzo, Lucia Dumitru, Irina Kleps and Dan Dascalu, Romanian Academy Press, Bucharest, **2006,** pp. 178 -191. ISBN: (10) 973-27-1422-0.

19) M. Tomoaia-Cotisel, "Multifunctional nanostructures formed of gold or silver nanoparticles and different biomolecules with medical applications", *e-Book*, Cluj University Press, Cluj-Napoca, 2016, pp. 322; ISBN 978 606 37 0017 0.

Additional information

♦ In recognition of my scientific activity, I am a member in 11 professional societies, international (4) and national ones (7), related to biochemistry, physical chemistry, biophysics, biomaterials, nanostructures, surface science, nanotechnology and nanoscience.

♦ **I am the founder and the director of the Research Center in Physical Chemistry at my university in Cluj-Napoca http://www.chem.ubbcluj.ro/romana/ANEX/cf/pcas/index.htm**

♦From **2005**, I am a National and an International Expert in Physical Chemistry, Biotechnology, Science of nanostructured biomaterials, Nanoscience and Nanobiotechnology.

♦ **2010** in the quality of Evaluator/Expert International in European Community, I evaluated several scientific project proposals within the Operational Programme Research and Development for Innovations, European Structural Funds, (priority axis 2) in Prague, Czech Republic.

● **Relevant projects**

- Project Manager

5 (CEEX) **/2005** - Strategies of interfacial nanofabrication in research and development of some novel functional nanomaterials and plan supramolecular structures for nanotechnology and nanodevices.

127 (Academy) **/2005** - Thermodynamic and kinetic study of the formation of nanostructured systems at interfaces. Theory and experiments.

1312 (CNCSIS) **/2006** - Research and development of some nanostructures of biological interest. 0rganization of nanoparticles in complex superstructures with applications in nanosciences.

994 / 2007 - Impact program - ANCS - European structural funds - Research, development and innovation for nanobiostructures and multifunctional supramolecular systems.

257 (IDEI) /**2011 -** Multifunctional nanostructures formed of gold or silver nanoparticles and different biomolecules with medical applications

171 (PN2) **/2012 -** Development of new tools and smart composites based on advanced nanotechnology for medical applications

4-005 (EuroNanoMed) **/2013 -** Multifunctional injectable nano HAp composites for the treatment of osteoporotic bone fractures

- Project scientific responsible

B.50 / 2000 international grant, World Bank and CNCSIS, Realization of a scientific platform with modern techniques for multiple users.

591 (CEEX) **/ 2006** . New ionomer biocompozites based on modified polialchenoic acids with resins and surface active glasses with multiple applications in medicine.

41-050 / 2007 - Methods and technologies based on molecular and cellular medicine with applications in surgery and treatment of bone cancer, bone metastases and osteo-articular lesions.

31- 039 / 2007 - The development of ecological products from biodegradable materials, designated for realization of packages and protection elements.

Here, I certify that the above statement is true.

Date: January 24, 2021

Univ. Prof. Dr. Maria Tomoaia-Cotisel