



# Georgian National Academy of Sciences



## Personal Data (CV)

Surname	<b>Katsarava</b>	First Name	<b>Ramaz</b>
Address (work, home)	<b>Kakha Bendukidze University Campus, #240 David Aghmashenebeli Alley, Tbilisi, 0131, Georgia 28, Janashia str., Tbilisi 0179, Georgia</b>	Date and place of birth	<b>15 September 1943, Khoni, Georgia</b>
Citizenship	<b>Georgia</b>	Telephone number(s)	<b>599 15 92 09, 225 01 60</b>
E-mail	<a href="mailto:r.katsarava@agruni.edu.ge">r.katsarava@agruni.edu.ge</a> <a href="mailto:kats@gtu.ge">kats@gtu.ge</a>		

### 3. Education

Education	Institution	Learning Time
Secondary	1 <sup>st</sup> school of Tbilisi 47 <sup>th</sup> school of Tbilisi	1950-1957 1958-1960
Higher	Georgian Polytechnic Institute, Tbilisi	1960-1966
Postgraduate study, doctoral candidacy	D.I. Mendeleev Institute of Chemical Technology, Moscow	1966-1969

### 4. Knowledge of Languages

Foreign languages	Level of language proficiency (fluent, intermediate, beginning with the help of a dictionary)
Russian	Fluent
English	Intermediate

### 5. Scientific or Academic Degree and Rank

	Title of the thesis	Date of conferment	Degree
Ph.D. thesis	Synthesis and study of cyclo-chain polymers on the basis of poly(amino amido acid)s	May, 1971	Candidate of Chemical Sciences
Doctoral thesis	Synthesis of hetero-chain polymers using the method of activated esters (Active Polycondensation)	February, 1988	Doctor of Chemical

			<b>Sciences</b>
Academician Doctor	-		
Professor	<b>Polymer Chemistry</b>	<b>1993</b>	<b>Professor</b>
Corresponding Member of the Academy	-	-	-
Member of the Academy	<b>Polymer Chemistry</b>	<b>17 June 2019</b>	<b>Academician</b>

## 6. Work Experience

Date	Institution	Position
1966	P.Melikishvili Institute of Physical and Organic Chemistry (Tbilisi)	Researcher
1970-1973	A.N.Nesmeyanov Institute of Elementorganic Compounds (INEOS), Acad. Sci. of USSR, Moscow	Researcher
1974-1986	I.Beritashvili Institute of Physiology, Georgian Acad. Sci. (Tbilisi)	Senior Researcher
1986-1998	Institute of Molecular Biology and Biophysics, Georgian Acad. Sci. (Tbilisi)	Head of Laboratory
1993 to date	Georgian Technical University (Tbilisi)	Professor
1997 to date	Center of Medical Biotechnology and Bioengineering, Georgian Technical University (Tbilisi)	Head of the Center
2009-2013	Institute of Medical Polymeric Materials, Tbilisi State University	Director
2013 to date	Institute of Chemistry & Molecular Engineering Agricultural University of Georgia (Tbilisi)	Director, Professor

### 6.1 Teaching Activity

Date	Institution	Position
1993 to date	Georgian Technical University (Tbilisi)	Professor
2013 to date	Institute of Chemistry & Molecular Engineering Agricultural University of Georgia (Tbilisi)	Director, Professor

### 6.2 Work Abroad

Form of activity	Date	Place and Institution
Delivering a course of lectures at foreign higher education institutions	1994	Shinshu შინშუს უნივერსი University, Japan
Long-term academic mission to research institutions	1994 1995 1998	Shinshu University, Japan University of Hamburg, Germany Cornell University, USA

## 7. Sphere of Scientific Interests

<p>Creation of new "Active" and "Active-Silyl" polycondensation methods of polymers synthesis, development of "Silyl" and "Click" polycondensations. Synthesis of various hetero-chain polymers (polyamides, polyesters, polyurethanes, polyureas, poly(heteroarylene)s, etc. using new polycondensation methods of polymer synthesis. Synthesis, study and applications of new biodegradable and biocompatible (bioassimilative) polymers - pseudo-proteins [poly(ester amide)s, poly(ester urethane)s, poly(ester urea)s and copolymer thereof, functional, water soluble polymers, hydrogels etc.) composed of naturally occurring and non-toxic building blocks such as <math>\alpha</math>-amino acids, <math>\alpha</math>-hydroxy acids, dicarboxylic acids and diols. The application of pseudo-proteins as resorbable surgical materials, drug sustained/controlled release devices, artificial organs, etc.</p>
<p>Scientific interests in past: synthesis of aromatic poly(amino amide)s by interaction of aromatic tetraamines with aromatic dianhydrides, synthesis of soluble poly(benzoylene benzimidazole)s, polyimides and other thermally and radio stable polymers on the basis of aromatic poly(amino amide)s.</p>

## 8. Publications (Total number, indicating the Citation Index (*number*))

### 8.1 Monographs

Years
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2009	Functional Polymers
2013	Polydisperse systems on the basis of biodegradable polymers for medical applications.

## 8.2 Principal Papers (no more than 50)

Years	
1984	<b>R.D.Katsarava</b> , D.P.Kharadze, L.M.Avalishvili, M.M.Zaalishvili. Synthesis of polyamides from bis-pentafluorophenyl esters of dicarbonic acids and diamines. <i>Makromol.Chem. Rapid Comm.</i> <b>5</b> , 585-591.
1985	<b>R.D.Katsarava</b> , D.P.Kharadze, N.Sh.Japaridze, L.M.Avalishvili, T.N.Omiadze, M.M.Zaalishvili. Heterochain polymers based on natural amino acids. Synthesis of polyamides on the base of N <sup>α</sup> ,N <sup>ε</sup> -bis-trimethylsilyl lysine alkyl esters. <i>Makromol.Chem.</i> <b>186</b> , 939-954.
1986	<b>R.D.Katsarava</b> , D.P.Kharadze, L.M.Avalishvili. Synthesis of high-molecular-weight polysuccinamides by polycondensation of active succinates with diamines. <i>Makromol.Chem.</i> <b>187</b> , 2053-2062 .
1988	<b>R.D.Katsarava</b> , D.P.Kharadze, T.M.Bendiashvili, Ya.G.Urman, I.Ya.Slonim, S.G.Alekseeva, P.Cefelin, V.Janout. Synthesis of polyamides by active polycondensation. The structural and kinetical aspects of active esters aminolysis reactions. <i>Acta Polymerica</i> , <b>39</b> ,523-533.
1991	<b>R.D.Katsarava</b> . Advances and problems of active polycondensation. <i>Russian Chem.Rev.</i> , British Library, <b>60</b> , 722-737.
1993	<b>R.D.Katsarava</b> , T.M.Kartvelishvili, N.N.Japaridze, Ts.A.Gogvadze, T.A.Khosruashvili, R.P.Tiger, P.A.Berlin. Synthesis of polyureas by polycondensation of diamines with active derivatives of carbonic acid. <i>Makromol. Chem.</i> , <b>194</b> , 3209-3228.
1994	N.Arabuli, G.Tsitlanadze, L.Edilashvili., D..Kharadze, Ts.Gogvadze, V.Beridze, Z.Gomurashvili, <b>R.Katsarava</b> . Heterochain polymers based on natural □-amino acids. Synthesis and enzymatic hydrolysis of regular poly(ester amide)s based on bis(L-phenylalanine) α,ω – alkylene diesters and adipic acid. <i>Macromol. Chem. Phys.</i> , <b>195</b> , 2279-2289.
1999	<b>R.Katsarava</b> , V.Beridze, N.Arabuli, D.Kharadze, C.C.Chu, C.Y.Won. Amino acid based bioanalogous polymers. Synthesis and study of regular poly(ester amide)s based on bis(□-amino acid) α,ω – alkylene diesters and aliphatic dicarboxylic acids. <i>J.Polym.Sci.: Part A: Polym.Chem.</i> <b>37</b> , P.391-407.
1999	D.Kharadze, L.Kirmelashvili, N.Medzmariashvili, V.beridze. G.Tsitlanadze, D.Tughushi, C.C.Chu, <b>R.Katsarava</b> . Synthesis and α-chymotrypsinolysis of regular poly(ester amides)s based on phenylalanine, diols and terephthalic acid. <i>Polymer Sci. (Russia), Ser.A.</i> , <b>41</b> , P.883-890.
2000	Z.Gomurashvili, H.R.Kricheldorf, <b>R.Katsarava</b> . Amino acid based bioanalogous polymers. Synthesis and study of new regular poly(ester amides)s composed of hydrophobic α-amino acids and dianhydrohexitoles. <i>J.Macromol. Sci.-Pure and Appl. Chem.</i> <b>37</b> (3), 215-227.
2002	K.Markoishvili, G.Tsitlanadze, <b>R.Katsarava</b> , J.G.Morris., A.Sulakvelidze. A Novel Sustained-Release Matrix Based on Biodegradable Poly(Ester Amide)s and Impregnated with Bacteriophages and an Antibiotic Shows Promise in Healing Wounds Infected with Various Pathogenic Bacteria. <i>Intern. J. Dermatology</i> , <b>41</b> , 453-458.
2002	S.H. Lee, I. Szinai, K.Carpenter, <b>R. Katsarava</b> , G. Jokhadze, C.C.Chu, Y. Huang, E.Verbeken, O.Bramwell, I. De Scheerder, M.K. Hong. <i>In Vivo</i> Biocompatibility Evaluation of Stents Coated With A New Biodegradable Elastomeric and Functional Polymer. <i>Coronary Artery Disease</i> , <b>13</b> (4), 237-241 .
2003	<b>R.Katsarava</b> , Active Polycondensation – from peptide chemistry to amino acid based biodegradable polymers. In: <i>H.R.Kricheldorf (Ed.), "Polycondensation 2002", Macromolecular Symposia</i> , <b>199</b> , P. 419-429, Wiley-VCH, September.
2004	G.Tsitlanadze, M.Machaidze, T.Kviria, N.Djavakhishvili, C.C.Chu, <b>R.Katsarava</b> . Biodegradation of amino acid based poly(ester amide)s: <i>in vitro</i> weight loss and preliminary <i>in vivo</i> studies. <i>J. Biomater. Sci., Polym. Ed.</i> <b>15</b> (4), 1-24.
2004	G.Tsitlanadze, T.Kviria, C.C.Chu, <b>R.Katsarava</b> . Biodegradation of amino acid based poly(ester amide)s: <i>in vitro</i> study using potentiometric titration. <i>J Mater Sci.: Mater in Medicine</i> <b>15</b> , 185-190.
2005	K.Guo, C.C.Chu, E.Chkhaidze, <b>R.Katsarava</b> . Synthesis and Characterization of Novel Biodegradable Unsaturated Poly(Ester-Amide)s. <i>J. Polym. Sci. Part A: Polym. Chem.</i> <b>43</b> , 1463-1477.
2005	D. Jikia, N. Chkhaidze, E. Imedashvili, I. Mgaloblishvili, G.Tsitlanadze, <b>R.Katsarava</b> , J.Glenn Morris, Jr., A.Sulakvelidze. The use of PhagoBioDerm, a novel biodegradable preparation capable of the sustained release of bacteriophages and ciprofloxacin, in the complex treatment of <i>Staphylococcus aureus</i> -infected local radiation injuries caused by the exposure to Sr <sup>90</sup> . <i>Clinical and Experimental Dermatology</i> , <b>30</b> , 23-26.
2006	N.Neparidze, M.Machaidze, N.Zavradashvili, N.Mazanashvili, V.Tabidze, D.Tugushi, <b>R.Katsarava</b> . Biodegradable copoly(ester amide)s with hydrophobic lateral substituents. <i>Polimery i Meditsina</i>

	(Russia), #2, 27-33.
2007	G.Jokhadze, M.Machaidze, H.Panosyan, C.C.Chu, <b>R.Katsarava</b> . Synthesis and characterization of functional elastomeric poly(ester amide)s copolymers. <i>J. Biomater. Sci. Polym. Ed.</i> , 18(4), 411-438.
2007	I.Legashvili, N.Nepharidze, <b>R.Katsarava</b> , B.Sannigrahi, I.M.Khan. Non-covalent nano-adducts of copoly(ester amide) and poly(ethylene glycol): preparation, characterization and model drug-release studies. <i>J. Biomater. Sci. Polymer Edn</i> , Vol. 18, No. 6, pp. 673–685.
2008	N.Zavradashvili, G.Jokhadze, T.Kviria, <b>R.Katsarava</b> . Thermally- and photo-chemically curable biodegradable poly(ester amide)s with double bond moieties in lateral chains, <i>In: Chemistry of Advanced Compoinds and Materials</i> , N.Lekishvili and G.E.Zaikov, Eds. NOVA Science Publishers, Inc., PP 173-179.
2008	Z. Gomurashvili, H. Zhang, J. Da, T.D. Jenkins, J. Hughes, M. Wu, L. Lambert, K.A. Grako, K.M. DeFife, K. Macpherson, V. Vassilev, <b>R. Katsarava</b> , W.G. Turnell, From drug-eluting stents to biopharmaceuticals: poly(ester amide) a versatile new bioabsorbable biopolymer, <i>ACS Symposium Series 977: Polymers for Biomedical Applications</i> , Eds A. Mahapatro, A.S. Kulshrestha, Oxford University Press, 10-26.
2011	E. Chkhaidze, D. Tugushi, D. Kharadze, Z. Gomurashvili, C.-C. Chu, <b>R. Katsarava</b> . New unsaturated biodegradable poly(ester amide)s composed of fumaric acid, L-leucine and $\alpha,\omega$ -alkylene diols. <i>J.Macromol.Sci., Part A, Pure &amp; Appl. Chem.</i> <b>48</b> (7), 544-555.
2011	<b>R. Katsarava</b> , D. Tugushi. Non-conventional polymers composed of naturally occurring $\alpha$ -amino acids. <i>Journal of Characterization and Development of Novel Materials</i> , 2(3/4), 325-342 ().
2011	<b>R. Katsarava</b> , D. Tugushi. Non-conventional polymers composed of naturally occurring $\alpha$ -amino acids. <i>Unique Properties of Polymers and Composites: Pure and Applied Science Today and Tomorrow</i> . V.1. Yu. N. Bubnov, V. A. Vasnev, A. A. Askadskii and G. E. Zaikov, Eds., NOVA Sci. Publisher, Ch. 7, 113-131 ().
2011	<b>R. Katsarava</b> , Z. Gomurashvili. Biodegradable Polymers Composed of Naturally Occurring $\alpha$ -Amino Acids. <i>Handbook of Biodegradable Polymers - Isolation, Synthesis, Characterization and Applications</i> , Lendlein, A. and Sisson, A., Eds., Wiley-VCH, Verlag GmbH & Co. KGaA. Ch. 5, 107-131 ().
2012	S. Kobauri, N. Zavaradshvili, M.Dgebuadze, D. Tugushi, <b>R.Katsarava</b> . Novel Hydrophobic Biodegradable Ester-Polymers Obtained via Azlactone Chemistry. <i>Macromol. Symp.</i> , 315, 112–114 ().
2013	N.Zavradashvili, G.Jokhadze, M. Gverdtsiteli, G.Otinashvili, N.Kupatadze, Z.Gomurashvili, D. Tugushi, <b>R. Katsarava</b> . Amino Acid Based Epoxy-Poly(Ester Amide)s - a New Class of Functional Biodegradable Polymers: Synthesis and Chemical Transformations. <i>J.Macromol.Sci., Part A, Pure &amp; Appl. Chem.</i> <b>50</b> (5), 449-465 ().
2014	N.Zavradashvili, T.Memenishvili, N. Kupatadze, L.Baldi, X.Shen, D.Tugushi, C.Wandrey, <b>R.Katsarava</b> . Cell compatible arginine containing cationic polymer: one-pot synthesis and preliminary biological assessment. <i>Springer Book Series-Advances in experimental medicine and biology: Infectious Diseases and Nanomedicine</i> , 59-73.
2014	T.Memanishvili, N.Zavradashvili, N.Kupatadze, D.Tugushi, M.Gverdtsiteli, V.P.Torchilin, C.Wandrey, L.Baldi, S.S.Manoli, <b>R.Katsarava</b> . Arginine-based biodegradable ether-ester polymers of low cytotoxicity as potential gene carriers. <i>Biomacromolecules</i> , 15, 2839-2848.
2014	A.Díaz, <b>R.Katsarava</b> , J.Puiggali. Synthesis, properties and applications of biodegradable polymers derived from diols and dicarboxylic acids: from polyesters to poly(ester amide)s (Review). <i>Int. J. Mol. Sci.</i> <b>15</b> , 7064-7123.
2014	L.El Haddad, N. Ben Abdallah, P.-L. Plante, J. Dumaresq, <b>R. Katsarava</b> , S. Labrie, J. Corbeil, D.St-Gelais, S. Moineau, Improving the safety of <i>Staphylococcus aureus</i> polyvalent phage by their production on a <i>Staphylococcus xylosus</i> strain. <i>PLoS ONE</i> 9(7): e102600. doi:10.1371/journal.pone.0102600.
2014	M. Planellas, M.M. Pérez-Madrugal, L.J. del Valle, S. Kobauri, <b>R. Katsarava</b> , C. Alemán, J. Puiggali. Microfibres of conducting polythiophene and biodegradable poly(ester urea) for scaffolds. <i>Polymer Chemistry</i> . 6, 925-937. DOI: 10.1039/c4py01243g.
2015	A.Díaz, L.J. del Valle, D.Tugushi, <b>R.Katsarava</b> , J.Puiggali. New poly(ester urea) derived from L-leucine: electrospun scaffolds loaded with antibacterial drugs and enzymes. <i>Materials Science and Engineering C</i> , <b>46</b> 450–462.
2015	<b>R.Katsarava</b> , J.Puiggali. Leucine Based Polymers: Synthesis and Applications. Book chapter in: <i>Leucine: Biology, Consumption and Benefits</i> . Biochemistry Research Trends, S.R. Newman, Ed., NOVA Sci. Publisher.
2015	S.K.Murase, L.-P. Lv, A.Kaltbeitzel, K.Landfester, L.J.del Valle, <b>R.Katsarava</b> , J.Puiggali, D. Crespy. Amino acid-based poly(ester amide) nanofibers for tailored enzymatic degradation prepared by miniemulsion-electrospinning. <i>RSC Adv.</i> , 5, 55006-55014. DOI: 10.1039/C5RA06267E
2015	S.K. Murase, L.J.del Valle, S.Kobauri, <b>R.Katsarava</b> , J. Puiggali. Electrospun fibrous mats from a L-

	phenylalanine based poly(ester amide): Drug delivery and accelerated degradation by loading enzymes, <i>Polym. Degrad. Stabil.</i> , 119, 275-287.
2015	D. Kharadze, T. Memanishvili, K. Mamulashvili, T. Omiadze, L. Kirmelashvili, Z.Lomtadze, <b>R.Katsarava</b> . <i>In Vitro</i> Antimicrobial Activity Study of Some New Arginine-based Biodegradable Poly (Ester Urethane)s and Poly (Ester Urea)s. <i>J. Chem. Chem. Eng.</i> 9, 524-532 doi: 10.17265/1934-7375/2015.08.008
2016	T. Memanishvili, N. Kupatadze, D. Tugushi, <b>R. Katsarava</b> , S. Wattananit, N. Hara, D. Tornero, Z. Kokaia. Generation of cortical neurons from human induced-pluripotent stem cells by biodegradable polymeric microspheres loaded with priming factors. <i>Biomed. Mater.</i> 11, 025011. doi:10.1088/1748-6041/11/2/025011.
2016	L.J.del Valle, L.Franco, <b>R.Katsarava</b> , J.Puiggali. Electrospun biodegradable polymers loaded with bactericide agents. <i>AIMS Molecular Science</i> , 3(1), 52-87. doi: 10.3934/molsci.2016.1.52.
2016	<b>R.Katsarava</b> , N.Kulikova, J.Puiggali. Amino Acid Based Biodegradable Polymers – promising materials for the applications in regenerative medicine (Review). <i>J. J. Regen. Med.</i> , 1(1): 012.
2016	Tem. Kantaria, Teng. Kantaria, S.Kobauri, M.Ksovreli, T.Kachlishvili, N.Kulikova, D.Tugushi, <b>R.Katsarava</b> . Biodegradable nanoparticles made of amino acid based ester polymers: preparation, characterization, and <i>in vitro</i> biocompatibility study. <i>Appl. Sci.</i> 6, 444; doi:10.3390/app6120444
2017	J.Puiggali, <b>R.Katsarava</b> . Bionanocomposites. In Clay-Polymer Nanocomposites, Ch. 7, Kh. Jlassi, M.M. Chehimi, S. Thomas, Eds., Elsevier Publisher.
2017	N.Zavradashvili, G.Jokhadze, M.Gverdsiteli, D.Tugushi, <b>R.Katsarava</b> . Biodegradable functional polymers composed of naturally occurring amino acids (Review). <i>Res Rev Polym.</i> 8(1), 105-128.
2018	Puiggali, J.; Díaz, A., <b>Katsarava, R.</b> Bio-based aliphatic polyesters from dicarboxylic acids and related sugar and amino acid derivatives. In “Biodegradable and biocompatible polymer composites”. Navinchandra Shimpi Ed. Elsevier, Chapter 11, pp. 317-349. DOI: 10.1016/B978-0-08-100970-3.00011-0
2018	Ten. Kantaria, Tem. Kantaria, G.Titvinidze, G.Otinashvili, N.Kupatadze, N.Zavradashvili, D.Tugushi, <b>R.Katsarava</b> . New 1,2,3-Triazole Containing Polyesters via Click Step-Growth Polymerization and Nanoparticles Made of Them. <i>Int. J. Polym. Sci.</i> , V Article ID 6798258, <a href="https://doi.org/10.1155/2018/6798258">https://doi.org/10.1155/2018/6798258</a>
2018	A.Díaz, L.J del Valle, N.Rodrigo, M.T. Casas, G.Chumburidze, <b>R.Katsarava</b> , J.Puiggali. Antimicrobial Activity of Poly(ester urea) Electrospun Fibers Loaded with Bacteriophages. <i>Fibers</i> , 6, 33; doi:10.3390/fib6020033.
2018	M.L.Lamas, M.S.Lima, A.C.Pinho, D.Tugushi, <b>R.Katsarava</b> , E.Costa, I.J. Correia, A.C. Serra, JF.J. Coelho, A.C.Fonseca. Towards the development of miscible poly( $\epsilon$ -caprolactone)/ poly(ester amide)s electrospun mats. <i>Polymer</i> , DOI <a href="https://doi.org/10.1016/j.polymer.2018.07.050">10.1016/j.polymer.2018.07.050</a> .
2018	F. Calman, P. Pelit Arayici, H.K. Buyukbayraktar, M. Karahan, Z.Mustafaeva, R. Katsarava. Development of Vaccine Prototype Against Zika Virus Disease of Peptide-Loaded PLGA Nanoparticles and Evaluation of Cytotoxicity. <i>Intern. J. Peptide Res. Therap.</i> Doi:10.1007/s10989-018-9753-2
2018	S. Kobauri, G. Otinashvili, T.Kantaria, D.Tugushi, D.Kharadze, J. Puiggali, <b>R. Katsarava</b> . New amino acid based biodegradable poly(ester amide)s via bis-azlactone chemistry. <i>J.Macromol.Sci., Part A, Pure &amp; Appl. Chem.</i> <a href="https://doi.org/10.1080/10601325.2018.1513776">https://doi.org/10.1080/10601325.2018.1513776</a>
2019	J. Puiggali, L.J. del Valle, <b>R.Katsarava</b> . Other miscellaneous materials and their nanocomposites, Chapter 10. In “Nanomaterials and Polymer Nanocomposites”. Niranjana Karak Ed. Elsevier, 353-398.
2019	N.Zavradashvili, C. Sarisozen, G.Titvinidze, Teng. Kantaria, D.Tugushi, J.Puiggali, V. Torchilin, <b>R. Katsarava</b> . Library of Cationic Polymers Composed of Polyamines and Arginine as Gene Transfection Agents, <i>ACS Omega</i> , 2090-2101, <a href="http://dx.doi.org/10.1021/acsomega.8b02977">http://dx.doi.org/10.1021/acsomega.8b02977</a>
2019	S.Kobauri, Tem. Kantaria, N.Kupatadze, N.Kutsiava, D.Tugushi, R. <b>Katsarava</b> . Pseudo-proteins: A new family of biodegradable polymers for sophisticated biomedical applications, <i>Nano technology &amp; nano science journal</i> , 1(1): 37-42.

### 8.3 Textbooks, Additional Manuals, and other Methodological Literature and Training means

Years	
2017	<b>Engineering of Polymers for Medical and Technical Applications</b>

### 8.4 Electronic Publications

Years	Title	Address of Source
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### 8.5 Participation in Scientific Symposiums, Conferences for the last ten years

Years	Title	Name of Event
2010	Biodegradable arginine-based polymers with PEG-like backbones as potential non-viral gene delivery system,	1 <sup>st</sup> "Biomaterials and bionanomaterials: recent advances and safety-toxicology issues", May 3-9, 2010, Iraklion, Crete, Greece.
2011	New biodegradable copoly(amide/ester amide)s obtained <i>via</i> bis-azlactone chemistry.	World Forum Polychar-19, March 20-25, 2011, Kathmandu, Nepal.
2011	New approach to the design of 3M poly(ester amide)s: the synthesis of functional polymers.	IUPAC 9 <sup>th</sup> International Conference on Advanced Polymers via Macromolecular Engineering APME-2011, 5-8 September 2011, Cappadocia, Turkey. P-81.
2012	The use of artificial skin Phagobioderm® in the complex treatment of local radiation injuries caused by exposure to sr90,	International Symposium "Radiation Safety Challenges in the 21st Century", P. 51-52, June 20-21, 2012, Yerevan, Armenia.
2012	Arginine-based biodegradable ether-ester polymers - synthesis and cytotoxicity study,	9 <sup>th</sup> International Symposium on Polyelectrolites, S5-3, July 9-12, 2012, Lausanne, Switzerland.
2012	Arginine-containing new polycationic polymers: synthesis and complex formation study.	9 <sup>th</sup> International Symposium on Polyelectrolites, P6-4, July 9-12, 2012, Lausanne, Switzerland
2012	One-pot synthesis of arginine-containing polycationic polymers,	9 <sup>th</sup> International Symposium on Polyelectrolites, P8-4, July 9-12, 2012, Lausanne, Switzerland.
2012	Amino Acid Based Biodegradable Polymers - Versatile Materials for Numerous Biomedical Applications,	15 <sup>th</sup> International Conference "Polymeric Materials 2012", September 12-14, 2012, Halle (Saale), Germany.
2012	New L-Arginine containing polycationic polymers: synthesis and study of complexes polymer/pDNA.	First International Conference on Infectious diseases and Nanomedicine ICIDN-2012, 15-18 Dec 2012, Kathmandu, Nepal.
2013	New Bioresorbable Bis-azlactone Drug Delivery Systems for Therapeutical Moco- and Nanocarriers: Design,Synthesis and Study.	International Conference on Emerging Technologies: Micro to Nano 2013. February 23-24, 2013, Goa, India, Proceedings.
2013	New Arginine-containing cationic polymers for intracellular gene delivery.	Congress of the European Polymer Federation (EPF 2013), Pisa, Italy, June 16-21, 2013.
2013	Amino Acid Based Biodegradable Polymers - Versatile Materials for Numerous Biomedical Applications.	10 <sup>th</sup> IUPAC International Conference on Advanced Polymers via Macromolecular Engineering. August 18th – 22nd 2013, Durham University, UK.
2013	PEG-PEA-PEG Triblock-Copolymeric Micelles as Potential Biodegradable Nanocarriers For Pharmaceuticals.	International conference on chemical engineering Chemtech-2013, December 26-28, Istanbul, 2013, Turkey. DAKAM Publishing, Istanbul, pp 41-45 (2013).
2013	New biodegradable arginine-containing	World academy of science, engineering and technology. Issue, 83, November 2013, Venice, Italy.
		Drug Discovery and Therapy Word Congress,

	polymers for therapeutical gene carriers: design, synthesis and study.	and Global Biotechnology Congress, June 16-19 2014, Boston, MA, USA. Abstracts, P. 127-128.
2014	Biodegradable amino acid-based polymeric microparticles for improved functional recovery in stem cell therapy after stroke.	Intern Conf. on Food and Biotechnology, ICFB2014, 11-12 September, Tbilisi, Georgia.
2014	Biodegradable polymers and bacteriophages and their potential to guard the food safety.	8-th Eurasian Meeting on heterocyclic Chemistry 20-24 September, 2014, Tbilisi, Georgia. Abstract Book, P.36-37.
2014	Heterocyclic compounds in the design of biodegradable polymers.	Canadian International Conference on Advances in Computer Science, Engineering and Applied Science ICCEA 2014, 3th-4th December, Dubai.
2014	Nanosilver containing antimicrobial composites on the basis of ethanol-soluble biodegradable poly(ester amide).	3 <sup>rd</sup> International Conference on Organic Chemistry (ICOC-2014). proceedings, pp 70-71. Tbilisi, Georgia.
2014	New cationic polymers composed of naturally occurring building blocks – arginine and spermine.	XIII reunión del grupo especializado de polímeros (gep) de la rseq y rsef., Girona, del 7 al 10 de septiembre de 2014.
2014	Electrospun scaffolds from amino acid based poly(ester urea): applications as drug delivery and conducting systems.	249 <sup>th</sup> ACS National Meeting & Exposition, March 22-26, 2015, Denver, CO, USA
2015	OGP Functionalized Phenylalanine-based Poly(ester urea) for Enhancing Osteoinductive Potential of human Mesenchymal Stem Cells.	ICBEB 2015: 17th International Conference on Biochemical Engineering and Bioengineering., Paris, France, April 27-28, 2015.
2015	Amino Acid Based Biodegradable Poly(Ester-Amide)s and Their Potential Biomedical Applications as Drug Delivery Containers and Antibacterials.	17 <sup>th</sup> International Conference on Bioengineering and Bionanotechnology, Chicago, October 08-09, 2015, 17(10) Part II, P. 146.
2015	Drug Delivery Nanoparticles of Amino Acid Based Biodegradable Polymers.	XIV Reunión Bienal del Grupo Especializado en Polímeros. 5-8 Septiembre, Burgos, Espana, 2016.
2015	Incorporation of bacteriophages into electrospun microfibrillar matrices of a leucine based poly(ester urea).	EUPOC 2016 on Block Copolymers for Nanotechnology Application, Gargnano – Lake Garda (Italy), May 22-26, 2016.
2016	Antimicrobial Nanocompositions Made of Amino Acid Based Biodegradable Polymers	18 <sup>th</sup> International Conference on Biotechnology and Nanotechnology (ICBN 2016), New-York, June 06-07, 2016, 18(6) Part V, P. 604.
2016	Nanoparticles Made Of Amino Acid Derived Biodegradable Polymers As Promising Drug Delivery Containers.	7 <sup>th</sup> international conference "Biomaterials and nanobiomaterials: recent advances safety-toxicology and ecology issues", 8-15 May 2016, Heraklion, Crete, Greece
2016	New arginine- and spermine-based cationic	18th International Conference on Chemical Engineering and Technology (ICCET 2016),



2016	polymers as antimicrobial and gene transfection agents..	New-York, October 10-11, 2016.
2016	Bis-azlactone Based Biodegradable Poly(ester amide)s: Design, Synthesis and Study,	The 3rd International Conference on Bioinspired and Biobased Chemistry and Materials. October 16-19, 2016, Nice, France.
2016	Biodegradable cationic polymers composed of spermine and arginine: synthesis, cell compatibility, and biological activity.	Nano-2016 - 4th International Conference "Nanotechnologies". October 24-27, 2016, Tbilisi, Georgia.
2017	Nano-complexes DNA/cationic biodegradable polymers for potential applications in gene therapy.	Int. Congress "Frontiers in Polymer Science", Sevilla, Spain, 2017.
2017	Hydrogels prepared from poly( $\gamma$ -glutamic acid) nanofiber matrices as a bacteriophages-releasing system.	<i>5<sup>th</sup> International Caucasian Symposium on Polymers &amp; Advanced Materials</i> , July 2-5, 2017, Tbilisi, Georgia, Proceedings, p. 84.
2017	Heterochain polymers <i>via</i> tricomponent click step-growth polymerization: optimization of the reaction.	World Congress on Pharmacology & Chemistry of Natural Compounds, 09-11 October, 2017, Tbilisi, Georgia.
2017	Synthesis of new 1,2,3-triazole cycles-containing biodegradable clicking polyesters for potential biomedical applications.	IV International Scientific Conference of Young Researchers "Biotechnology: Science and Practice", Yerevan, 28-30 September, 2017
2017	Amino acids based biodegradable polymers - pseudo-proteins for sophisticated biomedical applications.	World Congress on Pharmacology & Chemistry of Natural Compounds, 09-11 October, 2017, Tbilisi, Georgia.
2017	New Biodegradable Polymers Composed of Amino Acids – Promising Materials for the Applications in the medical field.	6th World Congress on Biopolymers, September 07-09, 2017, Paris, France.
2017	In vitro biocompatibility and cell permeability study of biodegradable nanoparticles made of amino acid based poly(ester amide).	6th World Congress on Biopolymers, September 07-09, 2017, Paris, France.
2017	Synthesis of new biodegradable clicking polyesters via tricomponent step-growth polymerization.	19th International Conference on Biomedical and Pharmaceutical Engineering (ICBPE 2017), Miami, USA, Dec 14-15, 2017. pp 1544-1547.
2018	Amino Acid Based Biodegradable Amphiphilic Polymers and Micelles Made from Them as Drug Delivery Systems: Synthesis and Study,	IRCCS-JST CREST Joint Symposium "Chemical sciences facing difficult challenges". January 24-26, 2018, Kyushu University, Fukuoka, Japan.
2018	Synthesis and structure of chiral polyelectrolytes for gene delivery.	EuroSciCon Conference on Chemistry (Chemistry 2018), 19-20 February, 2018, Paris, France)
2018	Nanoparticles for medical applications made of biodegradable amino acid based polymers: preparation and modification.	EuroSciCon Conference on Chemistry (Chemistry 2018), 19-20 February, 2018, Paris, France)
2018		9 <sup>th</sup> international conference "Biomaterials and

2018	<p>“Click chemistry”-based step growth polymerization: a new approach for the synthesis of novel clicking biodegradable polymers.</p> <p>Elaboration of biodegradable poly(ester amide) nanoparticles for ocular drug delivery and in vivo preliminary study of their permeability into the ocular barriers.</p>	<p>nanobiomaterials: recent advances safety-toxicology and ecology issues", 06-13 May 2018, Heraklion, Crete, Greece.</p> <p>9<sup>th</sup> international conference "Biomaterials and nanobiomaterials: recent advances safety-toxicology and ecology issues", 06-13 May 2018, Heraklion, Crete, Greece.</p>
2018	<p>New 1,2,3-triazole containing polymers <i>via</i> click step-growth polymerization (csgp).</p>	<p>PolyChar26 World Forum on Advanced Materials. September 10-13, 2018, Tbilisi, Georgia, Proceedings p. 39.</p>
2018	<p>Synthesis and study of multifunctional cationic polymers.</p>	<p>PolyChar26 World Forum on Advanced Materials. September 10-13, 2018, Tbilisi, Georgia.</p>
2018	<p>Pseudo-proteins - a new family of biodegradable polymers for sophisticated biomedical applications.</p>	<p>PolyChar26 World Forum on Advanced Materials. September 10-13, 2018, Tbilisi, Georgia.</p>
2018	<p>New polymer synthesis <i>via</i> alkyne-azide step growth click polymerization.</p>	<p>3rd International Conference on Biopolymers &amp; Polymer Chemistry (ICBPC-2018). October 22-23, 2018, Prague, Czech Republic.</p>
2018	<p>New biodegradable cationic polymers for versatile biomedical application.</p>	<p>1<sup>st</sup> International Scientific Conference “Current State of Pharmacy and Prospects of its Development” dedicated to 100<sup>th</sup> anniversary of Yerevan State University and the 75<sup>th</sup> anniversary of the NAS RA, Yerevan, 2018.</p>
2018	<p>Synthesis of new biodegradable poly(ester amide)s composed of non-proteinogenic <math>\alpha</math>-amino acids.</p>	<p><i>ICAPSC 2018: 20th International Conference on Applications of Polymers in Synthetic Chemistry</i>, December 17-18, 2018 Barcelona, Spain.</p>
2018	<p>Nanosilver Containin Antibacterial Composites on the Basis of Biodegradable Polymers</p>	<p>20<sup>th</sup> International Conference on Nanotechnology Materials and Applications, Paris, France, Dec 27-28, 2018, p 1762</p>
2018	<p>Drug Delivery Nano-Containers Based on Pseudo-Proteins,</p>	<p>New Future by Chemical Synthesis and Energy Materials. January 25-26, 2019. Kyoto University, Uji, Japan</p>
2019	<p>Synthesis and Physicochemical Properties of Chiral Cationic Polymers. IRCCS The 2<sup>nd</sup> International Symposium -</p>	<p>International Conference on Biomedical Engineering and Technology, New-York, USA, Jan 30-31, 2019, p 1720.</p>
2019	<p>Nanocarriers Made of Amino Acid Based Biodegradable Polymers: Poly(Ester Amide) and Related Cationic and PEGylating Polymers,</p>	<p>BIONANOTOX 2019, 10<sup>th</sup> International Conference “Biomaterials and nanobiomaterials: Recent advances, safety, toxicology and ecology issues”, Heraklion, Crete, Greece, on May 05-12, 2019.</p>
2019	<p>Hybride cationic polymers composed of arginine ans spermine – synthesis and preliminary</p>	<p>BIONANOTOX 2019, 10<sup>th</sup> International Conference “Biomaterials and nanobiomaterials: Recent advances, safety, toxicology and ecology issues”, Heraklion, Crete, Greece, on May 05-12, 2019.</p>

2019	cytotoxicity study.	10th International Conference on Chemistry, May 09-10, 2019, Amsterdam, Netherlands, Modern Chemistry & Applications 2019, Vol. 07; DOI: 10.4172/2329-6798-C1-015.
2019	Library of Cationic Polymers Composed of Polyamines and Arginine as Gene Transfection Agents.	3 <sup>rd</sup> International Conference on Women Health and Breast Cancer (Women Health-2019), May 30-31, 2019 Nice, France.
2019	Elaboration of biodegradable PEGylated nanoparticles made of $\alpha$ -amino acid based pseudo-proteins.	International Conference on Advances in Medical Biotechnology (CAMB 2019), June 11-12, 2019, Barcelona, Spain.
2019	New Biodegradable Cationic Polymers Composed of Arginine and Spermine: Synthesis, Characterization, and Cell Compatibility Assessment.	6 <sup>th</sup> International Caucasian Symposium on Polymers & Advanced Materials, July 17-20, 2019, Batumi.
2019	Micelles Made of Pseudo-proteins for Solubilization of Hydrophobic Biologicals.	6 <sup>th</sup> International Caucasian Symposium on Polymers & Advanced Materials, July 17-20, 2019, Batumi.
2019	Chemistry of pseudo-proteins and related synthetic amino acid based polymers	6 <sup>th</sup> International Caucasian Symposium on Polymers & Advanced Materials, July 17-20, 2019, Batumi.
2019	New cationic polymers composed of non-proteinogenic $\alpha$ -amino acids	
	Synthesis of new pseudo-proteins by interacting bis-azlactones with diamine-diester composed of non-proteinogenic amino acids.	

### 9. Organizational Work (Holding of Congresses and Conferences, Editorial Work)

Years	Name

### 10. Inventions (Author's Certificate, Patents)

Years	Name
2016	Polymer particle delivery compositions and methods of use, US Patent # 9,517,203
2014	Poly (ester urea) Polymers and Methods of Use, US Patent # 8,765,164
2013	Alkylene-dicarboxylate-Containing Biodegradable Poly(Ester-Amides) and Methods of Use, US Patent # 8,445,627
2011	Unsaturated Poly(ester-amide) Biomaterials, US Patent # 7,863,406
2010	Bioabsorbable Elastomeric Polymer Networks, Cross-Linkers and Methods of Use, US Patent # 7,649,022
2010	Bioactive Wound Dressings and Implantable Devices and Methods of Use. US Patent # 7,794,706
2008	Polymeric blends as biodegradable matrices for preparing biocomposites, US Patent # RE40359
2007	Elastomeric Functional Biodegradable Copolyester Amides and Copolyester Urethanes, US Patent # 7,304,122
2007	Elastomeric Functional Biodegradable Copolyester Amides and Copolyester Urethanes, US Patent # 7,408,018
2004	Polymeric blends as biodegradable matrices for preparing biocomposites, US Patent # 6,703,040
2003	Elastomeric Functional Biodegradable Copolyester Amides and Copolyester Urethanes, US Patent #

## 11. International and Local Scientific grants

Years	Name
1993	Project development Grant of C.N.R.S. (France)
1994	Individual Grant of International Science (G. Soros) Foundation (ISF), (USA).
1994	Research Grant of ISF (USA), Grant No RVF000.
1994	Short-term (3 months) grant of JSPS (Japan).
1995	Short-term (2 months, Dr. T.Kartvelishvili) grant of JSPS (Japan),.
1995	Joint Research Grant of ISF (USA) and Georgian Government, Grant No RVF200
1996	Short-term (1 month) Grant of DAAD (Germany).
1996	Long-term (2 years) Research Grant of CRDF No G2-116 (USA).
1997	Grant of Academy of Sciences of Georgia.
1997	Grant of E.Shevardnadze Foundation.
1997	Grant of ministry of Health of Georgia.
1998	Long-term (2 years) Research Grant of Cornell University (USA) (Sponsored by Medivas Nitric Oxide).
1998, 1999	G.Soros Professor.
2000	Long-term (2 years) Research Grant of ISTC (G-446).
2001	Equipment Grant of CRDF-RESC Program (GR2-997).
2002	Long-term (3 years) Research Grant of ISTC (G-802).
2004	Mini-grant-2 of CRDF-RESC Program (# GER2-1039-TB-03).
2004	Travel Grant of CRDF for young scientists (3 months, Dr. I Lagashvili)
2005	Mini-grant-3 of CRDF-RESC Program (# GER2-1039-TB-03 Mod 1).
2006	Mini-grant-4 of CRDF-RESC Program (# GER2-1039-TB-03 Mod 2).
2006	Research grant from Georgian NSF # GNSF/ST06/6-102 (with I.Kutateladze Institute of Pharmacochemisrty).
2006	Research grant from Georgian NSF # GNSF/ST06/6-103 (with I.Kutateladze Institute of Pharmacochemisrty).
2005	Travel Grant of CRDF for young scientists (3 months, Dr. I Legashvili)
2007	Grant of FP-6 project "INCOMAT".
2007	Travel grant from Georgian NSF.
2007	Research grant from STCU-Georgia (with I.Kutateladze Institute of Pharmacochemisrty) (#4309).
2007	Mini-grant-5 of CRDF-RESC Program (GEC1-9103-TB-07).
2008	CRDF/STEP grant (# BPG - 01/08) for scaled-up production of bactericidal medical glue GF-6.
2008	Research grant from Georgian SRNSF # ST07-4-182.
2008	Long-term (3 years) research grant from STCU (# 4170).
2008	Travel grant for invited US professor, CRDF's RESC "NSF Travel Grants Experience Exchange Program" (EEP).
2009	Long-term (3 years) research grant from Swiss National Science Foundation (SNF) # IZ73ZO_128071/1
2009	Research grant from Northeastern University of Boston, USA (6 months, PhD student. T.Memanishvili)
2010	CRDF/STEP grant (# BPG - 01/10) for scaled-up production of wound dressings GF-6-SS, GF-6-AF, and PhagoBioDerm®.
2010	Travel grant from Georgian NSF.
2010	Research grant from STCU-Georgia (#5247).
2010	Research grant from STCU-Georgia (#5061).
2010	Grant of Georgian SRNSF for young scientists (2 months, PhD student. T.Memanishvili).
2010	T.Memanishvili).
2011	Research grant (one year) of Georgian Technical University.
2011	Grant of Georgian SRNSF for young scientists (6 months, young co-worker T.Memani-

	shvili, Ph.D.).
2012-214	Research Grant of Georgian SRNSF for applied research (2 years) # AR-267
2012-2014	Research Grant of Georgian SRNSF for applied research (2 years) # AR-307
2012-2015	Research grant from Georgian SRNSF #D-13/09
2013	Valorization grant from Swiss National Science Foundation (SNF) IZ76ZO_147554/1
2013	Research grant of Georgian SRNSF # FR/608/8-313/12).
2014	Research Grant of Kakha Bendukidze Knowledge Fund “Nanoparticles made of amino acids based biodegradable polymers and their application for intraocular drug delivery”.
2014	Research Grant of Kakha Bendukidze Knowledge Fund “New cationic polymers composed of arginine and spermine as antimicrobial agents”
2014	Georgian SRNSF Grant for young scientist (co-worker N.Zavradashvili).
2015-2017	Research grant from STCU- Georgian SRNSF (#6074). Application of Click Chemistry in Macromolecular and Macrocyclic Syntheses
2015	Grant from Georgia’s Innovation and Technology Agency (GITA).
2017-2019	Research grant from STCU- Georgian SRNSF (# 6298). New biodegradable cationic polymers composed of arginine and spermine as versatile biomaterials for various biomedical applications
2017-2020	Research Grant of ISTC (A-2289, in cooperation with Armenia). Synthesis and screening of a new generation of optically active non-proteinogenic $\alpha$ -amino acids, peptides and polymers containing unsaturated groups in the side chain
2017	Research grant of Georgian SRNSF for PhD student (PhD student Tem. Kantaria).
2017	Postdoc scholarship from the U. of Hokkaido (co-worker N. Zavradashvili).
2018	Postdoc scholarship from the U. of Hokkaido (co-worker N. Zavradashvili)
2017-2020	Research grant from Rustaveli NSF (# FR17-102). Biodegradable nanocontainers and their application in ophthalmology for intravitreal drug delivery.
2019	DAAD (co-worker Temur Kantaria). “Elaboration of dexamethasone-loaded poly(ester amide) nanoparticles for ocular drug delivery”. University of Münster, Dr. P.Heidushka.
2019	DAAD (co-worker Tengiz Kantaria). New biodegradable antimicrobial polymers based on cationic triazolium groups in the backbone. Free University of Berlin, Prof. Daniel Klinger.

## 12. Scientific-Commercial Activity, author's certificate, Implementation

Years	Name

## 13. Other Activities

	Name	Years
<b>Supervision of PhD ans Dr Sci Theses and Masters work</b>	T.Kartvelishvili, PhD	1986
	L.Avalishvili, PhD	1987
	L.Kirmelashvili, PhDe	1989
	T.Omiadze, PhD	1991
	N.Arabuli, PhD	1991
	N.Medzmariashvili, PhD	2001
	V.Beridze, PhD	2001
	D.Kharadze, Dr.Sci.	2002
	Z.Gomurashvili, PhD	2003
	Z.Gomurashvili, PhD	2006
	T.Tsintsadze, PhD	2006
	G.Jokhadze, PhD	2008

	N.Neparidze, PhD E.Chkhaidze, PhD N.Zavradashvili, PhD M.Machaidze, PhD N.Kebadze, PhD T.Kviria, PhD M.Kharabadze, PhD I.Legashvili, PhD R.Khitsishvili, PhD M.Kiladze, PhD N.Ochkhikidze, PhD S.Kobauri, PhD T.Memanishvili, PhD V.Tabidze, PhD M.Dgebuadze, PhD S.Badzgaradze, PhD N.Kublashvili, PhD Ten, Kantaria, PhD Tem. Kantaria, PhD G.Chumburidze, PhD Sh.Tskhadadze, PhD	2008 2008 2008 2008 2008 2008 2008 2009 2010 2011 2011 2011 2012 2012 2012 2015 2016 2018 2018 2018 2018
<b>Supervision of Masters work</b>	N.Zavradashvili N.Kebadze M.Machaidze T.Kviria E.Chkhaidze N.Mazanashvili M.Kharabadze N.Mchedlishvili N.Mumladze V.Tabidze G.Chumburidze K.Khikhashvili M.Jamrishvili G.Antia D.Usanetashgvili G.Ugrekheldze T.Memanishvili N.Ochkhikidze E.Razmadze M.Tabatadze T.Sikharulidze R.Jikia M.Machaidze S.Kobauri Kayhan Atalay (Turkey) T.Beruashvili Ten.Kantaria Tem.Kantaria	
<b>Participation in International, State and Regional Programs</b>	Europrogram FP-6's Project "INCOMAT"	2006

#### 14. Awards and Prizes, Honorary Title

Date	Name of Awards, Prizes, Honorary Title
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1999	<b>Honour's order-bearer</b> (Georgia, 1999)
2007	<b>Gold Medalist</b> - World Intellectual Property Organization (WIPO) for Outstanding Inventor (2007).
2017	<b>The best Georgian Scientist</b> of the year (2017, Awarded by the Shota Rustaveli NSF of Georgia).
2018	<b>The Swante Arrhenius International Prize for the Creation of Pseudo-proteins for Biomedical Applications</b> (Awarded by World Forum "Polychar-26 on Advanced Materials, 2018).
2019	<b>Academician of the Georgian National Academy of Sciences</b>

## 15. Family Status

Married, wife – Natali Galdava-Otarishvili – architect,  
 Daughter – Tina Katsarava - designer.