



PROF. DR. GEORGE ALTANKOV

CURRICULUM VITAE (short version)

RESEARCH FIELD – tissue engineering, stem cells, cell-matrix interaction, biomaterials, nanofibers

PERSONAL INFORMATION

Business Address : Associate Member of Institute of Biophysics and Biomedical Engineering
Tel: +359889973008 E-mail: altankov@abv.bg

Date & Place of Birth : November 24, 1950, Sofia, Bulgaria

Citizenship : Bulgaria

Marital Status : Married, 2 child

DEGREES

Dr.Sci. : Bulgarian Academy of Sciences, Institute of Biophysics, Sofia, Bulgaria, 2004

Ph.D : Higher Medical Institute, Varna, Bulgaria, 1984

M.D. : Higher Medical Institute, Varna, Bulgaria, 1974

PROFESSIONAL PROGRESS AND SCHOLARSHIPS

Research Professor : Medical University Pleven

Project associated : -Leader WP-2 of project BG05M2OP001- 1.002-0010-C01 financed by the operative program "Science and education for intelligence growth"

ICREA Research Professor : Institute for Bioengineering of Catalonia (IBEC), Barcelona, Spain 2007-2018

Group Leader : "Molecular Dynamics at Cell-Biomaterials Interface" 2007-2018
(IBEC, Barcelona)

Associate Member : Bulgarian Academy of Sciences / Institute of Biophysics, 2007 - at present

Full Professor : Bulgarian Academy of Sciences / Institute of Biophysics, Sofia, 2004

Head of Department : "Cell Adhesion", Institute of Biophysics, Bulgarian Academy of Sciences, 2004-2007

Deputy Director : Institute of Biophysics, Bulgarian Academy of Sciences, Sofia, 1999-2001

Visiting Professor : Technical University Barcelona (UPC) 2005-2006

Associate Professor : Institute of Biophysics, Bulgarian Academy of Sciences, 1995-2004

Visiting Professor : GKSS Research Center, Institute of Chemistry, Teltow, Germany, 2002-2003
(Marie Curie Senior grant)

Short-Term Researcher : GKSS Research Center (1995-2001, annually), Humboldt University (1994), Germany
(DFG, NATO fellowships)

Post-Doc Researcher : Southwestern Medical Center at Dallas, Dept Cell Biology, TX, USA, 1991-1993

Research Associate : Institute of Biophysics, Bulgarian Academy of Sciences, 1984-1995

Visiting Researcher : Humboldt University (Charite), Berlin Germany, 1994
(University fellowship)

Assistant Professor : Higher Medical Institute, Department of Physiology, Varna, Bulgaria, 1976-1984

Military Service : 1974-1976

AWARDS AND OTHER DISTINCTIONS

ICREA Research Professor : -ICREA (Catalan Institution for Advanced Research and Technologies) position awarded upon strong international competition - 2007-2018

Memberships : -National Research Council on Molecular Biology, Biophysics and Biochemistry 1998-2007
-Union of Scientist of Bulgaria, Section Biochemistry and Biophysics, 1985-2007
-National Scientific Committee of Biophysics, Bulgaria 1995-2007
-Associate Member of Institute of Biophysics, Bulgarian Academy of Sciences, 2007-at present
-COST Management Committee (FP7 Program of EC) 2009-at present

Invited Talks : -Nanomedicine 2016, Nanomedicine and Nanotechnology in Health Care, July 25-27, 2016, Bangkok, Thailand, "Mesenchymal Stem Cells Behaviour in Nanofibrous Environment"
-ICAB Conference "Advances in Biomaterials, Drug Delivery and Regenerative Medicine" BioPolySurf Summer School, Barcelona 05/2005
-University of Hamburg, Germany, 06/2002
-Centre for Biomaterials at Polytechnical University of Valencia, Spain 10/2007
-1st World Congress on Nanomedicine (Beijing, China) June 1-2, 2010
-2nd World Congress on Nanomedicine (Shenzhen, China) Nov. 3-5, 2011
-XVIII Argentinean Congress of Bioengineering OBI 2012, LaPlata, Argentina, Sept. 28-29
-1st Biotechnology World Congress Dubai, Febr. 14-15, 2012

Editorial Board Member *Associate Editor* --- Journal of Biomaterials and Tissue Engineering

Organization International Meetings

Director: NATO ARW "Nanoengineered Systems for Regenerative Medicine" Varna, Bulgaria, Sept 21-24, 2007.

Chair: -17th European Conference on Biomaterials (Barcelona) Sept. 11-14, 2002
-2nd IBEC Symp. Bioengineering and Nanomedicine Barcelona, Apr. 14-15, 2009
-3rd IBEC Symp. Bioengineering and Nanomedicine Barcelona, June. 1-2, 2010
-1st World Congress on Nanomedicine (Beijing, China) June 1-2, 2010
-2nd World Congress on Nanomedicine (Shenzhen, China) Nov. 3-5, 2011
-1st Biotechnology World Congress, Dubai, February 14-15, 2012

Book Editor . Advances in Regenerative Medicine. Role of nanotechnology and engineering principles. Eds. Shastri VP, Altankov G and Lendlein A), Springer Netherlands, 2010.

PUBLISHING ACTIVITY

Over 120 publication (97 articles in peer-reviewed international journals; 1 Book; 5 book chapters, 6 patents),

~ 3170 Citations; h-index 33 (Google Scholar 2019)

RESEARCH GRANTS

Principal Investigator in **17 research projects** completed in Bulgaria (1994-2009), sponsored by: DFG (Germany), BMBF-WTZ (Germany), NATO-Linkage Grant, Marie Curie senior fellowship, Roche Diagnostic, Cytonet GMBH Hanover (Germany), National Research Council of Bulgaria, Spanish Ministry of Education and Science and FP7 Program of EC.

Succinct Funding ID as ICREA Professor at IBEC, Barcelona

FP7-PEOPLE-2012-IAPP (2013-2017) –FIBROGELNET– “Network for Development of Soft Nanofibrous Construct for Cellular Therapy of Degenerative Skeletal Disorders” (n° 324386) **(Coordinator)** Total costs of 950.000 Euro

MAT 2015 – 69315 –C3 (2015-2017) - MYOHEAL - Muscle regeneration after injury. Engineered biodegradable ion-loaded scaffolds to promote muscle regeneration. Collaborative Project funded by Spanish Ministry of Science and Innovation **(Principal investigator)** Total costs 70 000 Euro.

MAT2012-38359-C03-03 (2012-2014) –HELINSINERGY– “Material-driven Fibronectin Fibrillogenesis to Engineer Synergistic Growth Factor Microenvironments” funded by Spanish Ministry of Science and Innovation **(Principal Investigator)** Total costs of 50.000 Euro

EuroNanoMed project FP7 (2012-2014) –STRUCTGEL– “Nanostructured Gel for Cellular Therapy of Degenerative Skeletal Disorders” **(Coordinator)** Total costs of 752.239 Euro

EULANEST-037 (2010-2012) (European Latin American Network for Science and Technology) -FIBROGEL- “Bioinspired Nanofibrous Gel for Tissue Engineering of Cartilage and Bone” **(Coordinator)**. Total costs of 312. 650 Euro

THESIS SUPERVISION

Completed : 7 PhD: L.Smilenov (06/1993); R. Tzoneva (02/2003); N. Krasteva (02/2004); L. Maneva-Radivheva (5/2007); K. Hristova (12/2011); A. Kostadinova (11/2011), N. Coelho (11/2011), D. Gugutkov (10/2017)

Ongoing : 1 PhD: G. Toromanov.

RECENT PUBLICATIONS (last 10 years)

(From a total of over 120 original publications)

1. Komsa-Penkova R., Stoycheva S., Tonchev P., Stavreva G., Todinova S., Georgieva G., Yordanova A., Kyurkchiev S., Altankov G. Morphological and Quantitative Evidence for Altered Mesenchymal Stem Cell Remodeling of Collagen in an Oxidative Environment—Peculiar Effect of Epigallocatechin-3-Gallate. *Polymers* 2022, 14, 3957. <https://doi.org/10.3390/polym14193957> (IF 4.207).
2. Komsa-Penkova R, Stavreva G, Belemzova K, Kyurkchiev S, Todinova S, Altankov G. Mesenchymal Stem-Cell Remodeling of Adsorbed Type-I Collagen-The Effect of Collagen Oxidation. *Int J Mol Sci.* 2022 Mar 11;23(6):3058. doi: 10.3390/ijms23063058. PMID: 35328478; PMCID: PMC8953637.
3. Laura Ramalho, Salima Nedjari, Roberto Guarino, Firas Awaja, Dencho Gugutkov, George Altankov *Fibronectin/thermo-responsive polymer scaffold as a dynamic ex vivo niche for mesenchymal stem cells* *Journal of Materials Science: Materials in Medicine* (2020) 31:129, <https://doi.org/10.1007/s10856-020-06461-y>
4. Gonzalez Garcia, C., Cantini, M. , Ballester-Beltran, J., Altankov, G. and Salmeron-Sanchez, M. (2018) The strength of the protein-material interaction determines cell fate. *Acta Biomaterialia*, 77, pp. 74-84. (doi:10.1016/j.actbio.2018.07.016) (PMID:30006313)
5. Ikonov O, Altankov G, Diego Sbrissa D, Shisheva A (2018) PIKfyve inhibitor cytotoxicity requires AKT suppression and excessive cytoplasmic vacuolation *Toxicology and Applied Pharmacology*, Volume 356, 1 October 2018, Pages 151-158
6. Guillem-Marti J, Boix-Lemonche G, Gugutkov D, Ginebra MP, Altankov G & Manero JM (2018) Recombinant fibronectin fragment III8-10/polylactic acid hybrid nanofiber enhance the bioactivity of titanium surface, *Nanomedicine* Accepted for publication:Published online:22 March 2018: 10.2217/nnm-2017-0342
7. Nedjari S, Awaja F & Altankov G (2017) Three Dimensional Honeycomb Patterned Fibrinogen Based Nanofibers Induce Substantial Osteogenic Response of Mesenchymal Stem Cells, *Scientific Reports*, 7, 15947 doi:10.1038/s41598-017-15956-8
8. Maria Valeska Bianchi, Firas Awaja and George Altankov (2017) Dynamic adhesive environment alters the differentiation potential of young and ageing mesenchymal stem cells, *Materials Science & Engineering C*, September 2017, 78, 467-474
9. Hristova-Panusheva K, Keremidarska-Markova M, Altankov G, Krasteva N. (2017) Age-related Changes in Adhesive Phenotype of Bone Marrow-derived Mesenchymal Stem Cells on Extracellular Matrix Proteins, *Journal of New Results in Science (JNRS)* 6(1) 11-19
10. Gugutkov D, Awaja F, Belemzova K, Keremidarska M, Krasteva N, Kyurkchiev S, Gallego Ferrer G, Seker S, Elcin AE, Elcin YM and Altankov G (2017) Osteogenic Differentiation of Mesenchymal Stem Cells using Hybrid Nanofibers with Different Configurations and Dimensionality, *Journal of Biomedical Materials Research Part A (in press)* DOI: 10.1002/jbm.a.36065

11. Gugutkov D, Gustavsson J, Cantini M, Salmeron-Sánchez M and Altankov G (2017) Electrospun Fibrinogen/PLA Nanofibers for vascular tissue engineering, *Tissue Engineering and Regenerative Medicine* 11, 10, 2774-2781
 12. Forget J, Awaja F, Gugutkov D, Gustavsson J, Gallego Ferrer G, Coelho-Sampaio T, Hochman-Mendez C, Salmeron-Sánchez M, and Altankov G (2016) Differentiation of Human Mesenchymal Stem Cells Toward Quality Cartilage Using Fibrinogen-Based Nanofibers *Macromol. Biosci.* 2016 vol 16(9) 1348-1359
 13. Mingyan Zhao, George Altankov, Urszula Grabiec, Mark Bennett, Manuel Salmeron-Sanchez, Faramarz Dehghani & Thomas Groth (2016) Molecular composition of GAG-collagen I multilayers affects remodelling of terminal layers and osteogenic differentiation of adipose-derived stem cells, *Acta Biomaterialia* Vol 41, 1 September 2016, Pages 86–99 published on line: <http://dx.doi.org/10.1016/j.actbio.2016.05.023>
 14. Nuno Miranda Coelho, Virginia Llopis-Hernández, Manuel Salmerón-Sánchez and George Altankov (2016) *Dynamic Reorganization and Enzymatic Remodeling of Type IV Collagen at Cell Biomaterial Interface*, In "Advances in Protein Chemistry and Structural Biology: Enzymes Mechanisms and Dynamics: Insights from Experimental and Computational Methods (Hr. Hristov Ed) - 105" ELSEVIER | S&T Book Production, Chennai.
 15. Keremidarska, M., Gugutkov, D., Altankov, G. and Krasteva, N. (2015) Impact of electrospun nanofibres orientation on mesenchymal stem cell adhesion and morphology. *Comptes Rendus de L'Academie Bulgare des Sciences*, 68 (10): 1271-1276.
 16. Toromanov G, Gugutkov D, Gustavsson J, Planell J, Salmerón-Sánchez M, & Altankov G (2015) Dynamic Behavior of Vitronectin at the Cell–Material Interface, *ACS Biomater. Sci. Eng.*, 1 (10), pp 927–934.
 17. González-García C, Cantini M, Moratal D, Altankov G, Salmerón-Sánchez M (2013) Vitronectin alters fibronectin organization at the cell–material interface, *Colloids Surf. B: Biointerfaces*, 111, 618–625.
 18. Gugutkov D, Gustavsson J, Ginebra M-P and Altankov G (2013) Fibrinogen nanofibers for guiding endothelial cells behavior, *Biomater Sci*, 1, 1065-1073.
 19. Coelho NM, Salmerón-Sánchez M and Altankov G (2013) Fibroblast remodeling of type IV collagen at biomaterials interface, *Biomater. Sci*, 1, 494-50
 20. Perez RA, Altankov G, Jorge-Herrero E, Ginebra M-P (2013) Micro- and nanostructured hydroxyapatite-collagen microcarriers for bone tissue-engineering applications. *J Tissue Eng Regen Med.* 7, 353-361
 21. Virginia Llopis-Hernandez, Patricia Rico, David Moratal, George Altankov and Manuel Salmeron-Sanchez (2013) Role of Material-Driven Fibronectin Fibrillogenesis in Protein Remodeling, *BioResearch Open Access*, 2(5) 364-373. DOI: 10.1089/biores.2013.0017
 22. Pecheva E, Pramatarova L, Hikov T, Hristova K, Altankov G, Montgomery P and Hanawa T (2012) Electrodeposition of Hydroxyapatite-Nanodiamond Composite Coating on Metals. Interaction with Proteins and Osteoblast-like Cells (Chapter 11), In: *Electrodeposition: Properties, Processes and Applications*, Surya Mohanty (Ed.) ISBN 978-1-61470-826-1.
 23. Nuno Miranda Coelho, Cristina González-García, M. Salmerón-Sánchez and George Altankov (2011) Arrangement of Type IV Collagen on NH₂ and COOH functionalized surfaces, *Biotechnology&Bioengineering* 108, 12, 3009-3018
 24. Hristova K, Pecheva EV, Pramatarova LD, Altankov G (2011) The interaction of osteoblast-like cells with apatite-nanodiamond coatings depends on fibronectin, *J Mater Sci Mater Med*, 22, 8, 1891-1900
 25. Perez R, Del Valle S, Altankov G, Ginebra M-P (2011) Porous hydroxyapatite and gelatin/hydroxyapatite microspheres obtained by calcium phosphates cement emulsion, *J Biomed Mater Res Part B: Appl Biomater*, 97B, 156-168.
 26. Nuno Miranda Coelho, Cristina González-García, M. Salmerón-Sánchez and George Altankov (2011) Arrangement of Type IV Collagen and Laminin on Substrates with Controlled density of –OH groups, *Tissue Engineering, Part A* Sept, 17-18, 2245-2257.
 27. Dencho Gugutkov, Cristina Gonzales-Garcia, George Altankov and Manuel Salmeron-Sanchez (2011) Fibrinogen Organization at the Cell-Material Interface Directs Endothelial Cells Behaviour, *Bioactive and Biocompatible Polymers*, 26, 4, 375-387
 28. Nuno Miranda Coelho, Cristina Gonzales-Garcia, Josep A. Planell, Manuel Salmeron-Sanchez and George Altankov (2010) Different assembly of type IV collagen on hydrophilic and hydrophobic substrata alters endothelial cells interaction, *European Cells and Materials*, 19, 262-272.
 29. Pramatarova LD, Krasteva NA, Radeva EI, Pecheva EV, Dimitrova RP, Hikov TA, Mitev DP, Hristova KT and Altankov G (2010) Study of detonation nanodiamond – plasma polymerized hexamethyldisiloxan composites for medical application. *Journal of Physics: Conference Series* 253, 012078.
 30. Shastri V P, Altankov G and Lendlein A (2010) Editors "Advances in regenerative medicine: Role of nanotechnology and engineering principles", Springer Netherlands.
 31. Altankov G, Groth T, Engel E, Gustavsson J, Pegueroles M, Aparicio C, Gil F J, Ginebra M-P and Planell J A (2010) Development of Provisional Extracellular Matrix on Biomaterials Interface: Lessons from In Vitro Cell Culture, In: *Advances in Regenerative Medicine: Role of Nanotechnology and Engineering Principles* (eds. Shastri VP, Altankov G and Lendlein A) Springer Netherlands 19-43.
 32. Groth T, Liu Z-M, Niepel M, Peschel D, Kirchhof K, Altankov G and Faucheux N (2010) Chemical and physical modifications of biomaterial surfaces to control adhesion of cells. In: *Advances in Regenerative Medicine: Role of Nanotechnology and Engineering Principles* (eds. Shastri VP, Altankov G and Lendlein A) Springer Netherlands 253-284.
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33. Planell J A, Navarro M, Altankov G, Aparicio C, Engel E, Gil J, Ginebra M-P and Lacroix D (2010) Materials surface effects on biological interactions, *In: Advances in Regenerative Medicine: Role of Nanotechnology and Engineering Principles* (eds. Shastri VP, Altankov G and Lendlein A) Springer Netherlands 233-252
34. Manuel Salmeron-Sanchez and George Altankov (2010). Cell-Protein-Material interaction in tissue engineering, *Tissue Engineering*, Daniel Eberli MD PhD (Ed.), ISBN: 978-953-307-079-7, INTECH (Available at: <http://sciyo.com/articles/show/title/cell-protein-material-interaction-in-tissue-engineering>).
35. Georgi Toromanov, Cristina González-García, George Altankov, Manuel Salmerón-Sánchez (2010) Vitronectin activity on polymer substrates with controlled OH density, *Polymer* 51, 2329-2336.
36. Pegueroles, M, C. Aparicio, M. Bosio, E. Engel, F.J. Gil, J.A. Planell, G. Altankov Spatial organization of osteoblast fibronectin matrix on titanium surfaces: Effects of roughness, chemical heterogeneity and surface energy (2010) *Acta Biomaterialia* 6 291–301.
37. Gugutkov D, Cristina Gonzalez-Garcia, Jose Carlos Rodriguez Hernandez, George Altankov and Manuel Salmeron-Sanchez (2009) Biological Activity of the Substrate-Induced Fibronectin Network: Insight into the Third Dimension through Electrospun Fibers, *Langmuir* 25, 10893-10900.
38. Gugutkov D, Altankov G, José Carlos Rodríguez Hernández, Manuel Monleón Pradas, Manuel Salmerón Sánchez (2009) Fibronectin activity on substrates with controlled –OH density, *J Biomed Mater Res Part A* 92, 322-331.
39. Patricia Rico, Jose Carlos Rodriguez Hernandez, David Moratal, George Altankov, Manuel Monleon Pradas and Manuel Salmeron-Sanchez (2009) Substrate-Induced Assembly of Fibronectin into Networks: Influence of Surface Chemistry and Effect on Osteoblast Adhesion, *Tissue Eng. Part A*, 15, 11, 3271-3281.
40. Kostadinova A, Seifert B, Albrecht W, Malsch G, Groth Th, Lemdlein A, Altankov G (2009) Novel polymer blends for the preparation of membranes for biohybrid organs. *J Biomat Sci Polym Edn* 20(5-6): p. 821-39.
41. Kristin Kirchhof, Kamelia Hristova, Natalia Krasteva, George Altankov, Thomas Groth (2009) Multilayer coatings on biomaterials for control of MG-63 osteoblast adhesion and growth, *Journal of Materials Science: Materials in Medicine* 20, 897-907
42. Altankov G., T. Vladkova, N. Krasteva, A. Kostadinova, I. Keranov (2009) Preparation of protein repellent PEI/PEG coatings and fibronectin reorganization study on the coated surfaces, *Journal of the University of Chemical Technology and Metallurgy*, 44, 4, 333-340.
43. Gustavsson J, Altankov G, Errachid A, Samitier J, Planell J, Engel E (2008) Surface Modifications of Silicon Nitride Based ISFETs for Cellular Biosensor, *J Mater Sci: Mater Med* 19 (4) 1839-1850.
44. Keranov I, T Vladkova M, Minchev, A Kostadinova and G Altankov (2008) Preparation, characterization, and cellular interactions of collagen-immobilized PDMS surfaces, *Journal of Applied Polymer Science*, 110 (1), 321-330.
45. Engel E, Del Vila S, Aparicio C, Altankov G, Asin L, Planell JA and MP Ginebra (2008) Discerning the role of topography and ion exchange in cell response of bioactive tissue engineering scaffolds, *Tissue Engineering Part A*, 14 (8) 1341-1351.
46. Manara S, Paolucci F., Palazzo B, Marcaccio M, Foresti E, Tosi G, Sabatini S, Sabatino P, Altankov G, Roveri N (2008) Biomimetic hydroxiapatite coating electrochemically deposited on titanium plate, *Inorganic Chimica Acta* 361 (6), 1634-1645.
47. Maneva-Radicheva L, Ebert U, Dimoudis N and G. Altankov (2008) Fibroblast remodelling of collagen type IV is altered in contact with cancer cells, *Histology&Histopathology* 23, 833-841.

Patents:

1. Manev V, Maneva A, Altankov G, Maneva L, “Device for Extracorporeal Sorption of Carcino-embryonic Antigen”, BG Patent No 66184 B1, 2011
2. Jankova K, Altankov G, Ulbricht M, Gunnar J and V. Thom, “Biocompatible material with novel functionality”, European Patent Application WO 0215955, 28/02/2002
3. Altankov G, Dimoudis N. “Autodegradable microcarriers and their use” European Patent Application PCT/EP98/06715, 21/10/1998.
4. Serdev N, Altankov G, Brodvarova I, Tomov N “Method for coverage of wounds with epithelial cells” BG Patent No 51904/1993.
5. Altankov G. “Method for preparation of protein-coated gelatine microspheres”, BG patent (INRA) No 83394/18/03/1988
6. Altankov G, Popdimitrov I, “Camera for cell electrophoresis”, BG Patent (INRA) No 4349/05/05/1979.