**ANDREY ANISIMOV**

Born 07.11.1964

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**EDUCATION**

1. 1989 MSc., Petrozavodsk State University
2. 1995 PhD, St.-Petersburg State University

1998 Adjunct professor (docent) in biochemistry and molecular biology, Petrozavodsk State University

2014 Adjunct professor (Docent) in molecular biology, University of Helsinki

1. **PRESENT POSITION**

2013- Senior Research Scientist, Wihuri Research Institute, Helsinki;

**PREVIOUS PROFESSIONAL APPOINTMENTS**

1989-1991 Junior Research Associate, Karelian Research Center, Petrozavodsk, Russia;

1991-1994 Post-graduate fellowship in biochemistry, Petrozavodsk State University, Russia;

1994-1996 Research associate, Petrozavodsk State University, Russia;

###### 1996-2000 Senior researcher, Petrozavodsk State University, Russia;

2001-2003 Research scientist, Unicrop LTD, Helsinki;

2003-2007 Senior research scientist, Unicrop LTD, Helsinki;

2007-2013 Senior Research Scientist, University of Helsinki;

2013-present Senior Research Scientist, Wihuri Research Institute

**HONORS, AWARDS**

2011 Medix prize for the best Finnish scientific paper in molecular biology;

2013 Aesculap EANS Research Prize for the best clinical research paper of the year

2015 **Best paper Award in the category of Basic Science in Circulation**

**ACADEMIC GRANTS**

1996   5.000 € - Grant # 95-0-10.0-187 (RSCI - Center for Basic Research at St.-Petersburg State University);

1996   10.000 € - Grant # 96-04-49873 (RFBR - Russian Fund for Basic Research);

1999 10.000 € - Grant # 99-04-49442 (RFBR - Russian Fund for Basic Research)

**PUBLICATIONS**

40 original publications in peer-reviewed journals, 3 reviews.Publications cited times according to the Institute of Scientific Information. H-index:

**ORIGINAL PUBLICATIONS**

1. Raissadati A, Tuuminen R, Dashkevich A, Bry M, Kivelä R, Anisimov A, Syrjälä S, Arnaudova R, Rouvinen E, Keränen MA, Krebs R, Nykänen AI, Lemström KB. Vascular Endothelial Growth Factor-B Overexpressing Hearts Are Not Protected From Transplant-Associated Ischemia-Reperfusion Injury. Exp Clin Transplant. 2016 Sep 1. doi: 10.6002/ect.2016.0181. [Epub ahead of print]
2. Korhonen EA, Lampinen A, Giri H, Anisimov A, Kim M, Allen B, Fang S, D'Amico G, Sipilä TJ, Lohela M, Strandin T, Vaheri A, Ylä-Herttuala S, Koh GY, McDonald DM, Alitalo K, Saharinen P. Tie1 controls angiopoietin function in vascular remodeling and inflammation. *J Clin Invest*. 2016; 126(9):3495-3510.
3. Bui HM, Enis D, Robciuc MR, Nurmi HJ, Cohen J, Chen M, Yang Y, Dhillon V, Johnson K, Zhang H, Kirkpatrick R, Traxler E, Anisimov A, Alitalo K, Kahn ML. Proteolytic activation defines distinct lymphangiogenic mechanisms for VEGFC and VEGFD. *J Clin Invest*. 2016; 126(6):2167-2180.
4. Dashkevich A, Raissadati A, Syrjälä SO, Zarkada G, Keränen MA, Tuuminen R, Krebs R, Anisimov A, Jeltsch M, Leppänen VM, Alitalo K, Nykänen AI, Lemström KB. Ischemia-Reperfusion Injury Enhances Lymphatic Endothelial VEGFR3 and Rejection in Cardiac Allografts. *Am J Transplant*. 2016; 16(4):1160-1172.
5. Holopainen T, Räsänen M, Anisimov A, Tuomainen T, Zheng W, Tvorogov D, Hulmi JJ, Andersson LC, Cenni B, Tavi P, Mervaala E, Kivelä R, Alitalo K. Endothelial Bmx tyrosine kinase activity is essential for myocardial hypertrophy and remodeling. *Proc Natl Acad Sci U S A*. 2015; 112(42):13063-13068.
6. Jeltsch M, Jha SK, Tvorogov D, Anisimov A, Leppänen VM, Holopainen T, Kivelä R, Ortega S, Kärpanen T, Alitalo K. CCBE1 Enhances Lymphangiogenesis via A Disintegrin and Metalloprotease With Thrombospondin Motifs-3-Mediated Vascular Endothelial Growth Factor-C Activation. *Circulation*. 2014; 129(19):1962-1971.
7. Marbacher S, Frösén J, Marjamaa J, Anisimov A, Honkanen P, von Gunten M, Abo-Ramadan U, Hernesniemi J, Niemelä M. Intraluminal cell transplantation prevents growth and rupture in a model of rupture-prone saccular aneurysms. *Stroke.* 2014; 45(12):3684-3690.
8. Kivelä R, Bry M, Robciuc MR, Räsänen M, Taavitsainen M, Silvola JM, Saraste A, Hulmi JJ, Anisimov A, Mäyränpää MI, Lindeman JH, Eklund L, Hellberg S, Hlushchuk R, Zhuang ZW, Simons M, Djonov V, Knuuti J, Mervaala E, Alitalo K. VEGF-B-induced vascular growth leads to metabolic reprogramming and ischemia resistance in the heart. *EMBO Mol Med*. 2014; 6(3):307-321.
9. D'Amico G, Korhonen EA, Anisimov A, Zarkada G, Holopainen T, Hägerling R, Kiefer F, Eklund L, Sormunen R, Elamaa H, Brekken RA, Adams RH, Koh GY, Saharinen P, Alitalo K. Tie1 deletion inhibits tumor growth and improves angiopoietin antagonist therapy. *J Clin Invest*. 2014; 124(2):824-34.
10. Yao LC, Testini C, Tvorogov D, Anisimov A, Vargas SO, Baluk P, Pytowski B, Claesson-Welsh L, Alitalo K, McDonald DM. Pulmonary Lymphangiectasia Resulting from Vegf-C Overexpression During a Critical Period. *Circ Res*. 2014; 114(5):806-822.
11. Raissadati A, Jokinen JJ, Syrjälä SO, Keränen MA, Krebs R, Tuuminen R, Arnaudova R, Rouvinen E, Anisimov A, Soronen J, Pajusola K, Alitalo K, Nykänen AI, Lemström K. Ex vivo intracoronary gene transfer of adeno-associated virus 2 leads to superior transduction over serotypes 8 and 9 in rat heart transplants. *Transpl Int*. 2013. 26(11):1126-1137.
12. Leppänen VM, Tvorogov D, Kisko K, Prota AE, Jeltsch M, Anisimov A, Markovic-Mueller S, Stuttfeld E, Goldie KN, Ballmer-Hofer K, Alitalo K. Structural and mechanistic insights into VEGFR-3 ligand binding and activation. *Proc Natl Acad Sci U S A*. 2013. 110(32):12960-12965.
13. Gaál EI, Tammela T, Anisimov A, Marbacher S, Honkanen P, Zarkada G, Leppänen VM, Tatlisumak T, Hernesniemi J, Niemelä M, Alitalo K. Comparison of vascular growth factors in the murine brain reveals placenta growth factor as prime candidate for CNS revascularization. *Blood.* 2013. 122(5):658-665.
14. Kerkelä R, Karsikas S, Szabo Z, Serpi R, Magga J, Gao E, Alitalo K, Anisimov A, Sormunen R, Pietilä I, Koch WJ, Kivirikko KI, Myllyharju J, Koivunen P. Activation of hypoxia response in endothelial cells contributes to ischemic cardioprotection. *Mol Cell Biol.* 2013. 33(16):3321-9.
15. Anisimov A, Leppänen VM, Tvorogov D, Zarkada G, Jeltsch M, Holopainen T, Kaijalainen S, Alitalo K. The Basis for the Distinct Biological Activities of Vascular Endothelial Growth Factor Receptor-1 Ligands. *Science Signaling.* 2013. 6(282):ra52 (10 p.).
16. Hamm A, Veschini L, Takeda Y, Costa S, Delamarre E, Squadrito ML, Henze AT, Wenes M, Serneels J, Pucci F, Roncal C, Anisimov A, Alitalo K, De Palma M, Mazzone M. PHD2 regulates arteriogenic macrophages through TIE2 signaling. *EMBO Mol Med.* 2013. 5(6):843-857.
17. Anisimov A, Tvorogov D, Alitalo A, Leppänen VM, An Y, Han EC, Orsenigo F, Gaál EI, Holopainen T, Koh YJ, Tammela T, Korpisalo P, Keskitalo S, Jeltsch M, Ylä-Herttuala S, Dejana E, Koh GY, Choi C, Saharinen P, Alitalo K. Vascular endothelial growth factor-angiopoietin chimera with improved properties for therapeutic angiogenesis. *Circulation*. 2013. 127(4):424-434.
18. Huusko J, Lottonen L, Merentie M, Gurzeler E, Anisimov A, Miyanohara A, Alitalo K, Tavi P, Ylä-Herttuala S. AAV9-mediated VEGF-B Gene Transfer Improves Systolic Function in Progressive Left Ventricular Hypertrophy. *Mol Ther*. 2012. 20(12):2212-2221.
19. Robciuc MR, Skrobuk P, Anisimov A, Olkkonen VM, Alitalo K, Eckel RH, Koistinen HA, Jauhiainen M, Ehnholm C. Angiopoietin-Like 4 Mediates PPAR Delta Effect on Lipoprotein Lipase-Dependent Fatty Acid Uptake but Not on Beta-Oxidation in Myotubes. *PLoS One*. 2012;7(10):e46212.
20. de Oliveira RL, Deschoemaeker S, Henze A-T, Debackere K, Finisguerra V, Takeda Y, Roncal C, Dettori D, Tack E, Jönsson Y, Veschini L, Peeters A, Anisimov A, Hofmann M, Alitalo K, Baes M, D'hooge J, Carmeliet P, Mazzone M. Gene-Targeting of Phd2 Improves Tumor Response to Chemotherapy and Prevents Side-Toxicity. *Cancer Cell*. 2012. 22(2):263-277.
21. Weltner J, Anisimov A, Alitalo K, Otonkoski T, Trokovic R. Induced pluripotent stem cell clones reprogrammed via recombinant adeno-associated virus-mediated transduction contain integrated vector sequences. *J Virol*. 2012. 86(8):4463-4467.
22. Holopainen T, Saharinen P, D’Amico G, Lampinen A, Eklund L, Sormunen R, Anisimov A, Zarkada G, Lohela M, Heloterä H, Tammela T, Benjamin LE, Ylä-Herttuala S, Leow CC, Koh GY and Alitalo K. Effects of Angiopoietin-2-blocking antibody on endothelial cell-cell junctions and lung metastasis. *J Natl Cancer Inst*. 2012. 104(6):461-475.
23. Takeda Y, Costa S, Delamarre E, Roncal C, de Oliveira RL, Squadrito ML, Finisguerra V, Deschoemaeker S, Bruyère F, Wenes M, Hamm A, Serneels J, Magat J, Bhattacharyya T, Anisimov A, Jordan BF, Alitalo K, Maxwell P, Gallez B, Zhuang ZW, Saito Y, Simons M, De Palma M, Mazzone M. Macrophage skewing by Phd2 haplodeficiency prevents ischaemia by inducing arteriogenesis. *Nature*. 2011. 479(7371):122-126.
24. Zheng W, Tammela T, Yamamoto M, Anisimov A, Holopainen T, Kaijalainen S, Karpanen T, Lehti K, Ylä-Herttuala S, Alitalo K. Notch restricts lymphatic vessel sprouting induced by vascular endothelial growth factor. *Blood*. 2011. 118(4):1154-1162.
25. Leppänen VM, Jeltsch M, Anisimov A, Tvorogov D, Aho K, Kalkkinen N, Toivanen P, Ylä-Herttuala S, Ballmer-Hofer K, Alitalo K. Structural determinants of vascular endothelial growth factor-D - receptor binding and specificity. *Blood*. 2011. 117(5):1507-1515.
26. Tvorogov D, Anisimov A, Zheng W, Leppänen VM, Tammela T, Laurinavicius S, Holnthoner W, Heloterä H, Holopainen T, Jeltsch M, Kalkkinen N, Lankinen H, Ojala PM, Alitalo K. Effective Suppression of Vascular Network Formation by Combination of Antibodies Blocking VEGFR Ligand Binding and Receptor Dimerization. *Cancer Cell*. 2010. 18(6):630-640.
27. Bry M, Kivelä R, Holopainen T, Anisimov A, Tammela T, Soronen J, Silvola J, Saraste A, Jeltsch M, Korpisalo P, Carmeliet P, Lemström KB, Shibuya M, Ylä-Herttuala S, Alhonen L, Mervaala E, Andersson LC, Knuuti J, Alitalo K. Vascular Endothelial Growth Factor-B Acts as a Coronary Growth Factor in Transgenic Rats Without Inducing Angiogenesis, Vascular Leak, or Inflammation. *Circulation*. 2010. 122(17):1725-1733.
28. Nilsson I, Bahram F, Li X, Gualandi L, Koch S, Jarvius M, Söderberg O, Anisimov A, Kholová I, Pytowski B, Baldwin M, Ylä-Herttuala S, Alitalo K, Kreuger J, Claesson-Welsh L. VEGF receptor 2/-3 heterodimers detected in situ by proximity ligation on angiogenic sprouts. *EMBO J*. 2010. 29(8):1377-1388.
29. Leppänen VM, Prota AE, Jeltsch M, Anisimov A, Kalkkinen N, Strandin T, Lankinen H, Goldman A, Ballmer-Hofer K, Alitalo K. Structural determinants of growth factor binding and specificity by VEGF receptor 2. *Proc Natl Acad Sci U S A*. 2010. 107(6):2425-2430.
30. Anisimov A, Alitalo A, Korpisalo P, Soronen J, Kaijalainen S, Leppänen VM, Jeltsch M, Ylä-Herttuala S, Alitalo K. [Activated forms of VEGF-C and VEGF-D provide improved vascular function in skeletal muscle.](http://www.ncbi.nlm.nih.gov/pubmed/19443835?ordinalpos=1&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_DefaultReportPanel.Pubmed_RVDocSum) *Circ Res*. 2009. 104(11):1302-1312.
31. Saharinen P, Eklund L, Miettinen J, Wirkkala R, Anisimov A, Winderlich M, Nottebaum A, Vestweber D, Deutsch U, Koh GY, Olsen BR, Alitalo K. [Angiopoietins assemble distinct Tie2 signalling complexes in endothelial cell-cell and cell-matrix contacts.](http://www.ncbi.nlm.nih.gov/pubmed/18425119?ordinalpos=12&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_DefaultReportPanel.Pubmed_RVDocSum) *Nat Cell Biol*. 2008. 10(5):527-537.
32. Anisimov A, Koivu K, Kanerva A, Kaijalainen S, Juntunen K, Kuvshinov V. Cloning of new rubisco promoters from Brassica rapa and determination of their activity in stably transformed Brassica napus and Nicotiana tabacum plants. *Molecular Breeding*. 2007. 19(3):241-253.
33. Kuvshinov V, Anisimov A., Yahya BM, Kanerva A. Double recoverable block of function – a molecular control of transgene flow with enhanced reliability. *Environmental Biosafety Research*. 2005. 4(2):103-112.
34. Kuvshinov V, Anissimov A, Yahya BM. Barnase gene inserted in the intron of GUS—a model for controlling transgene flow in host plants. *Plant Science*. 2004. 167(1):173-182.
35. Anisimov AG, Chekmasova AA, Volkova TO, Nemova NN. Erythroid differentiation of K562 cells resistant to 2-(4'-dimethylaminostyryl)quinoline 1-oxide or 4-nitroquinoline 1-oxide is significantly increased after thymidine treatment. *Izv Akad Nauk Ser Biol*. 2003. (3):275-284 (article in russian).
36. Anisimov AG, Volkova TO, Chekmasova AA, Nemova NN. Phorbol-12-myristate-13-acetate prevents the inhibitory effect of A23187 on erythroid differentiation of K562 cells induced by dimethylsulfoxide. *Izv Akad Nauk Ser Biol*. 2002. (2):142-148 (article in russian).
37. Anisimov AG, Volkova TO, Chekmasova AA, Nemova NN. Chemically-induced differentiation of the tumor cell lines. *Ontogenez*. 2002. 33(5):325-341 (article in russian).
38. Anisimov AG, Chekmasova AA, Volkova TO, Nemova NN. Combination of thymidine and dexamethasone increases the K562 tumor cells sensitivity to human leukocytes cytotoxicity. *Tsitologiia*. 2001. 43(1):76-81 (article in russian).
39. Anisimov AG, Bolotnikov IA, Volkova TO. Changes in the K562 cell sensitivity to nonspecific lysis by human and rat leukocytes under the influence of sodium butyrate, dimethyl sulfoxide and phorbol-12-myristate-13-acetate. *Ontogenez*. 2000. 31(1):47-52 (article in russian).
40. Anisimov AG, Bolotnikov IA, Chekmasova AA, Volkova TO. Interaction of tumor cell differentiation induced in vitro and sensitivity of them to nonspecific lysis by natural killer cells. Possible mechanisms. *Tsitologiia.* 2000. 42(10):923-936. Review (article in russian).
41. Anisimov AG, Bolotnikov IA, Volkova TO. Effect of thymidine and phorbol-12-myristate-13-acetate on the erythroid differentiation of K562 cells and their sensitivity to nonspecific lysis by rat splenocytes. *Biull Eksp Biol Med*. 1999. 128(11):521-524 (article in russian).
42. Anisimov AG, Bolotnikov IA. Treatment of synchronized K562 cells by tetrafluoroaluminate does not modulate the fluorescence of ethidium bromide and 4'6-diamidine-2-phenylindole in case of the binding with nucleoid DNA. *Tsitologiia.* 1999. 41(8):680-684 (article in russian).
43. Anisimov AG, Bolotnikov IA. Interleukin-2 and staurosporine abolish inhibition of splenocyte nonspecific cytotoxicity caused by high doses of phorbol myristate acetate in rats. *Biull Eksp Biol Med*. 1998. 125(3):300-303 (article in russian).
44. Anisimov AG, Bolotnikov IA. Nicotinamide decreases DNA destabilization in K562 cells treated with AlF(-4). *Tsitologiia.* 1997. 39(9):822-828 (article in russian).
45. Anisimov AG, Bolotnikov IA. Modulation with phorbol myristate acetate and staurosporine of interleukin 2- induced proliferation and nonspecific cytotoxicity of rat lymphocytes. *Biull Eksp Biol Med*. 1996. 122(10):394-398 (article in russian).
46. Anisimov AG, Bolotnikov IA. Modulation of non-specific cytotoxicity of rat splenocytes by lectins and activators of G-proteins (AlF4-). *Immunologija*. 1995; (6): 26-30 (article in russian).
47. Bolotnikov IA., Anisimov AG. Participation of interleukin-2 in T-cell differentiation and development of non-specific cytotoxicity. *Immunologija*. 1994; (2): 17-23. Review (article in russian).

**ISSUED PATENTS**

6 patents with my participation as an inventor were granted and can be found from the US patent DB by numbers: 7,790,950; 7,728,192; 7,115,733; 7,238,853; 7,285,657 and 7,495,148. In addition, 6 patent applications.

**Patent applications**

1. Leppänen V-M, **Anisimov A**, Tvorogov D and Alitalo K. Crystal structure of VEGF-C in complex with VEGFR-2. U.S. Provisional Patent Application No: 61/276,691.
2. Leppänen V-M, Jeltsch M, **Anisimov A**, Tvorogov D, Kukka A and Alitalo K. Structure determinants of vascular endothelial growth factor-D-receptor binding and specificity. U.S. Provisional Patent Application No: 61/458,517.
3. Tvorogov D, **Anisimov A**, Leppänen V-M ja Alitalo K. Receptor tyrosine kinase binding compositions. U.S. Provisional Patent Application No: 61/362,988.
4. Leppänen V-M, **Anisimov A**, Tvorogov D and Alitalo K. VEGFR-3 dimerization revealed by the crystal structure of human VEGFR-3 domains 4 and 5. U.S. Provisional Patent Application No: 61/490,919.
5. Alitalo K, **Anisimov A**, Yamamoto M. Biomarker for sensitivity to therapy with a Notch inhibitor. U.S. Patent Application No: 20130039930 (February 14, 2013).
6. Alitalo K, Jeltsch M, **Anisimov A**. Use of CCBE1 to enhance VEGF-C and VEGFR-3-dependent processes such as lymphedema. Invention Disclosure Form 0292/2012 (University of Helsinki).

**OTHER SCIENTIFIC MERITS**

**Administration and leadership tasks:** in the past several years and currently I am the responsible person in AAV Gene Transfer and Cell Therapy Core Facility, which provides national as well as world-wide service in manufacturing adeno-associated viruses for gene therapy applications.

**REVIEWING MANUSCRIPTS AND EVALUATING GRANT PROPOSALS**

Peer-reviewed more than 40 manuscripts for various scientific Journals.

Evaluation of the grant proposal by Andrea Casazza for Research Foundation - Flanders (Fonds Wetenschappelijk Onderzoek - Vlaanderen, FWO). Title of the proposal: Unraveling the role of Neuropilin 1 in tumor-associated macrophages: implications for therapy. Evaluation was submitted 8.4.2013.