

February 25, 2009

**Anatoliy A. Gashev - Associate Professor**

**Education/Training**

State Medical Academy, St. Petersburg, Russia, 09/1980-06/1986, M.D. Medicine: General Practice, Awarded: 06/1986.

Department of Normal Physiology, State Medical Academy, St. Petersburg, Russia, Pavlov Institute of Physiology, Russian Academy of Sciences, St. Petersburg, Russia, 09/1986-08/1989, Ph.D.: Physiology. Awarded: 11/1989.

Department of Normal Physiology, State Medical Academy, Pavlov Institute of Physiology, Russian Academy of Sciences, St. Petersburg, Russia  
09/1996-09/1999, Doctor of Medical Sciences: Medical Physiology. Awarded: 10/2000.

**Employment**

Assistant Professor, Department of Normal Physiology, State Medical Academy, St. Petersburg, Russia, 09/1989-08/1998

Visiting Assistant Professor, Department of Medical Physiology, College of Medicine, Texas A&M University, College Station, TX, 09/1998-06/1999.

Assistant Professor, Department of Normal Physiology, State Medical Academy, St. Petersburg, Russia, 09/1999-08/2000.

Research Assistant Professor, Department of Medical Physiology, College of Medicine, Texas A&M University System Health Science Center, College Station, TX, 10/2000 – 08/2004.

Research Associate Professor, Department of Medical Physiology, College of Medicine, Texas A&M University System Health Science Center, College Station, TX, 09/2004 - 02/2009.

Associate Professor, Department of Systems Biology, College of Medicine, Texas A&M Health Science Center, College Station, TX, 02/2009-present.

**Teaching Experience**

9/1987-9/1996, 9/1999-6/2000. Teaching of full year course of seminars and laboratory works on medical physiology in Department of Normal Physiology, State Medical Academy, St. Petersburg, Russia. Approx. 700 contact hours / year.

9/1992 –9/1996 Course Organizer on Physiology of the Blood. Department of Normal Physiology, State Medical Academy, St. Petersburg, Russia.

6/1995 - 6/1997 Examination Organizer in Department of Normal Physiology, State Medical Academy, St. Petersburg, Russia.

8/2002 Teaching on the Post-Doctoral Training Program on Physiology, “Digestion, Absorption, Liver functions”, “Physiology of Lymph Transport”. College Station, Dallas, San Antonio, TX, USA.

10/2005-11/2005; 10/2006-11/2006 Teaching in MPHY 604 Advanced Cardiovascular Biology I course. “Molecular biology of lymphatic development and lymphangiogenesis”, “Microvascular exchange and Lymph transport”. College Station, TX, USA.

### **Professional Societies**

Russian Physiological Society – 1986 – present  
American Physiological Society – 1999 – present  
Microcirculatory Society - 2000 – present  
Member of MCS Membership Committee – 2004 – 2007  
Chair of MCS Membership Committee – 2007 – present  
International Society of Lymphology – 2008 – present

### **Grants**

#### **Ongoing**

08/15/08-07/31/13 NIH R01 AG030578 grant "Mechanisms of the age-related alterations in lymphatic pumping", Principal Investigator. Total amount: \$1,058,570/5 years direct costs.

04/01/07-03/31/11 2 R01 HL070308 grant “Influences of Lymph Flow on the Lymphatic Pump”, Co-Investigator with Principal Investigator Dr. D.C. Zawieja. Total amount: \$951,375/4 years direct costs

02/08/05-01/31/10 5 R01 HL080526 grant "Molecular mechanisms of lymphatic muscle contraction", Co-Investigator with Principal Investigator Dr. M. Muthuchamy. Total amount: \$1,205,260/5 years direct costs

#### **Completed**

09/30/03-08/31/08 1 R01 HL075199 grant "Physiological basis of vascular contractility", Co-Investigator with Principal Investigator Dr. D.C. Zawieja. Total amount: \$1,000,000/4 years direct costs (1 year no-cost extension)

03/15/03-02/28/07 NIH R01 HL-070308 grant “Influences of Lymph Flow on the Lymphatic Pump”, Co-Investigator with Principal Investigator Dr. D.C. Zawieja. Total amount: \$1,000,000/4 years direct costs.

04/2005 – 03/2006 Texas A&M University Center for Environmental and Rural Health pilot project grant “Lymphatic Pumping Mechanisms During Aging”. Principal Investigator. Total amount: \$25,000/ year direct costs.

09/2003 – 08/2005 Texas A&M University Life Sciences Task Force Program of Excellence Award “Mechanisms of Edema Resolution: Implications for Treatment of Cardiovascular Disease”, Co-Investigator with Program Principal Investigator Dr. G. Laine. Total amount: \$400,000/2 years direct costs.

### **PENDING:**

07/01/09-06/30/14 NIH R01 grant "Aged-induced Lymph Pump Failure: Mechanisms and Experimental Correction", Principal Investigator. Total amount: \$1,250,000/5 years direct costs.

12/01/08-11/30/12 NIH R01 grant “Lymphatic fluid flow modeling with active network components”, Co-Investigator with Principal Investigator Dr. J. Moore. Total amount: \$1,944,448/4 years direct costs.

### **Honors**

6/1983-8/1986 Award Stipend from Ministry of High Education, Russia

6/1983-1/1986 Four-time Award Winner from the Rector of State Medical Academy, St. Petersburg, Russia

1/1988-6/1989 Patent Award from Moscow Patent Committee and 8 awards for new technical solutions in the research methods in physiology from the State Medical Academy, St. Petersburg, Russia.

11/1989 Rubashov Ph.D. Award for achievements in research and for successful completion of PhD program from the State Medical Academy, St. Petersburg, Russia.

11/2004 Microcirculatory Society 2004 Award for Excellence in Lymphatic Research. USA.

### **Invited Seminars and Symposia**

10/1985 St. Petersburg City Conference of young scientists. [Comparison of reactivity of main lymphatic vessels of white rat.] [Russian]

4/1988 St. Petersburg State Medical Academy Conference of young scientists. [The influence of lymphangion pump function from the different values of hydrostatic pressure.] [Russian]

12/1988 St. Petersburg City Conference of young scientists. [Correlation between parameters of lymphangion productivity and hydrostatic pressure.] [Russian]

7/1989 Satellite symposium to the XXXI International congress of Physiological Sciences. Leningrad, July 1989 “Lymphangion - theory, facts, applied aspects ”

10/1989 IV Symposium “Venous circulation and Lymph circulation”, Alma-Ata, Kazakhstan. [Lymphangion pump function in the conditions of perfusion by viscous solutions.] [Russian]

9/1991 VI Symposium “Central regulation of the blood circulation”. Rostov, Russia. [The mechanisms of regulation of the lymphangions interaction.] [Russian]

4/1994 St. Petersburg City Conference of young scientists. [The types of the contractions and the morphology of mesenteric lymphangions.] [Russian]

4/1995 St. Petersburg State Medical Academy Conference of young scientists. [The influence of the antibiotics solutions on the lymphangion pump function.] [Russian]

7/1997 XXXIII International Congress of Physiological Sciences, St. Petersburg, Russia. “Lymph Transport – Theory and Practice”

4/1999 Experimental Biology’99, Washington, DC, USA. “Lymphatic contractions: the role of distension mechanisms”.

4/2000 Experimental Biology’2000, San Diego, USA. “Flow mediated inhibition of the lymph pump in rat microlymphatics”.

10/2000 Congress of Russian Lymphologists. Moscow, Russia. [The spontaneous contractions of lymphangions: distension as a one from factors modulating a lymph flow]. [Russian]

3-4/2001 Experimental Biology’2001, Orlando, Florida, USA “The Roles of Rapid Changes in Lymph Flow Direction and NO Release in Flow-mediated Lymphatic Responses”.

08/2001 7<sup>th</sup> World Congress for Microcirculation, Sydney, Australia. “Comparison of the active lymph pumps of the rat thoracic duct and mesenteric lymphatics”, “The molecular basis of lymphatic contractions”.

04/2002 Seminar at Department of Medical Physiology, Texas A&M University Health Science Center, College Station, TX, USA. “Physiologic aspects of lymphatic contractile function”.

05/2002 Lymphatic Research Foundation Symposium “Lymphatic Continuum”. National Institutes of Health, Bethesda, MD, USA. “Physiologic aspects of lymphatic contractile function”.

08/2002 22<sup>nd</sup> Meeting of the European Society for Microcirculation. Exeter, Devon, UK, August 28-30, 2002. "Lymphatic Function and Contractile Proteins".

01/2003 Bioastronautics Investigators' Workshop, January 13-15, 2003. NASA, USRA. Galveston, Texas, USA. "Simulated microgravity inhibits the active lymph pump in rat thoracic duct".

04/2003 Experimental Biology'2003, San Diego, California, USA. "Effects of hindlimb suspension on active pumping of rat thoracic duct and mesenteric lymphatics".

05/2003 14<sup>th</sup> IAA Humans in Space Symposium. Banff, Alberta, Canada. "Simulated microgravity inhibits the active lymph pump in rats".

07/2003 Seminar at Pavlov Institute of Physiology, Russian Academy of Sciences, St. Petersburg, Russia. "Physiology of lymphatic pumping".

03/2004 Gordon Research Conference "Molecular Mechanisms in Lymphatic Function & Disease", Ventura, CA, USA. "Lymphatic contractile heterogeneity in rats".

04/2004 Experimental Biology'2004, Washington, DC, USA. "Heterogeneity of Intrinsic Lymph Pumps", "Modeling Strategies for Optimizing Lymph Flow".

05/2004 Aerospace Medical Association 75th Annual Scientific Meeting: Frontiers in Aerospace Medicine, Anchorage, AK, USA. "Simulated microgravity inhibits the rat regional lymph pumps".

04/2005 Experimental Biology'2005 and XXXV International Congress of Physiological Sciences, San Diego, California, USA. "Force-Velocity Relationships of Rat Mesenteric Lymphatics and Arterioles", "Measurement of flow in contracting mesenteric microlymphatic vessels in situ", "Lymphatic Vessel Function Adapts to High Flow Conditions", "Mechanical Properties of Rat Mesenteric Lymphatic and Arterial Smooth Muscle", "Contractile characteristics of bovine mesenteric prenodal lymphatics", "Influence of acute experimental edema on pumping of bovine mesenteric prenodal lymphatics", "Lymphatic Vessel Contraction Impedes Flow Under High Flow Conditions", "Extracellular-signal Regulated Kinase Inhibition Attenuates Contractile Activity in Rat Mesenteric Lymphatics", "Myosin Light Chain Kinase Inhibitor Decreases Lymph Pump Function in Rat Mesenteric Lymphatics", "Upregulated expression of immune function genes in rat lymphatic vessels", "Texas A&M University System Program for Excellence in Life Sciences: A New Paradigm for Lymphatic Vessel Research", "Differential Expression of Thin Filament Regulatory Proteins in Rat Lymphatics".

10/2005 1st Annual Cardiovascular Institute Retreat, TAMU HSC, Temple, Texas, USA. "Regional Heterogeneity in Lymphatic Contractile Behavior", "Active Pumping Generates Flow-Dependent Relaxation in Rat Thoracic Duct".

04/2006 Experimental Biology'2006, San Francisco, California, USA. "Differential functional and molecular effects on lymphatic pumping in aged-rat mesenteric lymphatics and thoracic

duct”, “Shortening velocities of rat mesenteric lymphatics during spontaneous and agonist-induced contractions”, “Inhibition of myosin light chain phosphorylation decreases rat mesenteric lymphatic pump function”, “Microarray analysis of molecular adaptation of lymphatic vessels to high flow conditions”, “Phasic contractions responsible for an NO-dependent relaxation in rat thoracic duct”, “Development of a cultured lymphatic muscle cell line from rat cervical duct”, “Effects of C-reactive protein on rat mesenteric lymphatic contractility”.

07/2006 FASEB Summer Research Conference on Smooth Muscle, Snowmass, Colorado, USA. “Differential expression of regulatory thin filament proteins in rat lymphatics”.

09/2006 Gordon Research Conference “Molecular Mechanisms in Lymphatic Function and Disease”, Les Diablerets, Switzerland. Oral presentation – “Mechanisms regulating lymphatic contraction and flow”; poster presentations – “Novel rate-sensitive contractile responses of lymphatic smooth muscle”, “Functional alterations in aged rat thoracic duct and mesenteric lymphatics”, “Phasic contractions cause an NO-dependent relaxation in rat thoracic duct”, “C-reactive protein modulates lymphatic pumping activity”, “Inhibition of myosin light chain phosphorylation decreases SP-induced tonic contraction of rat mesenteric lymphatics”.

10/2006 2nd Annual Cardiovascular Institute Retreat, TAMU HSC, College Station, Texas, USA. “The Age-Related Functional Alterations in Rat Thoracic Duct and Mesenteric Lymphatics”, “Potassium Channels are not Involved in the Imposed Flow-Dependent Inhibition in Rat Thoracic Duct”, “C-reactive protein modulates lymphatic pumping activity”, “Inhibition of myosin light chain phosphorylation decreases substance P-induced tonic contraction of rat mesenteric lymphatics”.

04/2007 Experimental Biology’2007, Washington, DC, USA.

Oral presentation – “The age-related alterations in lymphatic pumping”, posters – “The age-related alterations in lymphatic pumping”, “Imposed flow-dependent inhibition in rat thoracic duct is not dependent on K channel blockade”, “Pressure-volume relationships of rat mesenteric lymphatic vessels in response to controlled preload and afterload steps”, “Rate-sensitive contractile responses of rat mesenteric lymphatics to circumferential stretch”, “Regulation of Lymphatic Contractility by Myosin Light Chain Phosphorylation”.

08/2007 8<sup>th</sup> World Congress for Microcirculation, Milwaukee, WI, USA.

Oral presentation – “Intrinsic and extrinsic flow in lymphangions: a balance for effective lymph transport”, posters – “Rate-sensitive contractile responses of lymphatic muscle”, “Modulation of spontaneous lymphatic contractions by substance P”, “Flow-dependent inhibition of rat thoracic duct is not dependent on K channels”.

09/2007 European Society of Cardiologists Congress 2007, Vienna, Austria.

Oral presentation - “Mechanisms of lymph transport”.

10/2007 3rd Annual Cardiovascular Institute Retreat, TAMU HSC, Temple, Texas, USA. “Rate-sensitive contractile responses; unique properties of lymphatic vessel?”, “The development of

transfection techniques to target genes involved in the regulation of lymphatic contractility”, “NO-dependent regulation of lymphatic contractility by PKG”, “Regulation of lymphatic contractility by myosin light chain phosphorylation”.

08/2008 Seminar at Department of Systems Biology and Translational Medicine, Texas A&M Health Science Center, Temple/College Station, TX, USA. “Aging and lymph transport: new developments and future directions”.

09/2008 Invited seminar at Department of Normal Physiology, State Medical Academy, St. Petersburg, Russia. "Lymph transport: new developments and future directions".

11/2008 Invited seminar at Department of Biomedical Engineering, Texas A&M University, College Station, TX, USA. “Pressure and flow dependent modulation of lymphatic function and its age-related impairment”.

07/2009 XXXVI The International Union of Physiological Sciences 2009, Kyoto, Japan, July 27<sup>th</sup> - August 1st, 2009. Invited speaker – "Transport of lymph: mechanisms and potential for correction". (scheduled)

### **Symposia Organizer**

10/2007 3rd Annual Cardiovascular Institute Retreat, TAMU HSC, Temple, Texas, USA – Organizing Committee member and presentations judging committee member. Chair of session “Lymphatic Biology”.

Fall of 2009 Meeting of The Microcirculatory Society Inc., Frontiers in Microcirculation: Control Processes and Clinical Applications, 16-17 October 2009, The University of Missouri – Columbia, Member of Organizing Committee.

### **Symposia Chair**

Symposium 035, session 2 - "Transport of Lymph".

XXXIII International Congress of Physiological Sciences, St. Petersburg, Russia. June 30 - July 5, 1997. Chairs: R.S. Orlov and A.A. Gashev.

APS Symposium “Physiology of the Intrinsic Lymph Pump”

Experimental Biology 2004, Washington DC, USA, April 17-21, 2004. Chairs: D.C. Zawieja and A.A. Gashev.

10/2007 3rd Annual Cardiovascular Institute Retreat, TAMU HSC, Temple, Texas, USA – Organizing Committee member and presentation judging committee member. Chair of session “Lymphatic Biology”.

## **Journal Manuscripts:**

1. Gashev AA: [The pump function of the lymphangion and the effect on it of different hydrostatic conditions]. [Russian]. *Fiziologicheskii Zhurnal SSSR Imeni I. M. Sechenova* 1989;75:1737-43.
2. Gashev AA: [Pumping function of lymphangion depending on various hydrostatic gradients]. [Russian]. *Doklady Akademii Nauk SSSR* 1989;308:1261-4.
3. Gashev A.A. [The pump function of lymphangions depending on intravascular pressure and viscosity.] [Russian]. Russian Academy of Sciences. Pavlov Institute of Physiology. St. Petersburg, Russia. 1989. 122 p.
4. Gashev AA, Orlov RS, Borisov AV, Kliuchin'ski T, Andreevskaya MV, Bubnova NA, Borisova RP, Andreev YA, Erofeev NP, Priklonskaya EG: [The mechanisms of lymphangion interaction in the process of the lymph movement] [Russian]. *Fiziologicheskii Zhurnal Imeni I.M. Sechenova* 1990;76:1489-508.
5. Gashev AA: [The mechanism of the formation of a reverse fluid filling in the lymphangions]. [Russian]. *Fiziologicheskii Zhurnal SSSR Imeni I. M. Sechenova* 1991;77:63-9.
6. Orlov RS, Borisova RP, Bubnova NA, Gashev AA, Erofeev NP, Lobov GI, Pan'kova MN, Petunov SG: [The lymphatic vessels: their tonus, motility and regulation]. [Russian]. *Fiziologicheskii Zhurnal SSSR Imeni I. M. Sechenova* 1991;77:140-9.
7. Gashev AA, Orlov RS, Borisov AV, Malafeeva EYa: [The types of contractions of the lymphangions]. [Russian]. *Fiziologicheskii Zhurnal Imeni I. M. Sechenova* 1996;82:52-8.
8. Gashev A.A. [The pump function of lymphangions: the inherent regulatory mechanisms and the possibilities of pharmacological correction.] [Russian]. Russian Academy of Sciences. Pavlov Institute of Physiology. St. Petersburg, Russia, 2000. 264 p.
9. Gashev AA, Orlov RS, Zawieja DC. [Contractions of the lymphangion under low filling conditions and in absence of distension stimuli. A possibility of the suction effect]. [Russian]. *Rossiiskii Fiziologicheskii Zhurnal Imeni I M Sechenova*. 2001, 87 (1), 97-109.
10. Gashev AA, Zawieja DC. Physiology of Human Lymphatic Contractility: A Historical Perspective. *Lymphology*. 2001. 34 (3), 124-134.
11. Gashev AA, Davis MJ, Zawieja DC. Inhibition of the active lymph pump by flow in rat mesenteric lymphatics and thoracic duct. *The Journal of Physiology*. 2002. 540 (3). 1023-1037.
12. Gashev AA. Physiologic aspects of lymphatic contractile function: current perspectives. *Annals of the New York Academy of Sciences*. 2002. 979, 178-187.
13. Muthuchamy M, Gashev A, Boswell N, Dawson N, Zawieja D. Molecular and functional analyses of the contractile apparatus in lymphatic muscle. *FASEB J*. 2003 May; 17(8): 920-2. Epub 2003 Mar 28, 10.1096/fj.02-0626fje
14. Bridenbaugh EA, Gashev AA, Zawieja DC. Lymphatic Muscle: A Review of Contractile Function. *Lymphatic Research and Biology*. 2003, 1 (2), 147-158.
15. Gashev AA, Davis MJ, Delp MD, Zawieja DC. Regional variations of contractile activity in isolated rat lymphatics. *Microcirculation*. 2004. 11 (6) 477-492.
16. Dixon JB, Zawieja DC, Gashev AA, Cote GL. Measuring microlymphatic flow using fast video microscopy. *Journal of Biomedical Optics*, Nov/Dec 2005, 10, 064016 (2005) (7 pages).

17. Gashev AA, Delp MD, Zawieja DC. Inhibition of active lymph pump by simulated microgravity in rats. *Am J Physiol Heart Circ Physiol*. 2006 Jun;290(6):H2295-308. Epub 2006 Jan 6.
18. Davis MJ, Zawieja DC, Gashev AA. Automated measurement of diameter and contraction waves of cannulated lymphatic microvessels. *Lymphat Res Biol*. 2006 Spring;4(1):3-10.
19. Gasheva OY, Zawieja DC, Gashev AA. Contraction-Initiated NO-Dependent Lymphatic Relaxation: A Self-Regulatory Mechanism in Rat Thoracic Duct. *J Physiol*. 2006 Sep 15;575(Pt 3):821-32. Epub 2006 Jun 29.
20. Dixon JB, Greiner ST, Gashev AA, Cote GL, Moore JE, Zawieja DC. Lymph flow, shear stress, and lymphocyte velocity in rat mesenteric prenodal lymphatics. *Microcirculation*. 2006 Oct-Nov;13(7):597-610.
21. Quick CM, Venugopal AM, Gashev AA, Zawieja DC, Stewart R. Intrinsic Pump-conduit behavior of lymphangions. *Am J Physiol Regul Integr Comp Physiol*. 2007; 292(4): p. R1510-R1518. Epub 2006 Nov 22.
22. Dixon JB, Gashev AA, Zawieja DC, Moore JE Jr, Cote GL. Image correlation algorithm for measuring lymphocyte velocity and diameter changes in contracting microlymphatics. *Ann Biomed Eng*. 2007 Mar;35(3):387-96. Epub 2006 Dec 7.
23. Zhang R, Gashev AA, Zawieja DC, Davis MJ. Length-tension relationships of small arteries, veins, and lymphatics from the rat mesenteric microcirculation. *Am J Physiol Heart Circ Physiol*. 2007 Apr;292(4):H1943-52 2006 Dec 15; [Epub ahead of print]
24. Zhang R, Gashev AA, Zawieja DC, Lane MM, Davis MJ. Length-dependence of lymphatic phasic contractile activity under isometric and isobaric conditions. *Microcirculation*. 2007 Aug;14(6):613-25.
25. Davis MJ, Lane MM, Scallan JP, Gashev AA, Zawieja DC. An automated method to control preload by compensation for stress relaxation in spontaneously contracting, isometric rat mesenteric lymphatics. *Microcirculation*. 2007 Aug;14(6):603-12.
26. Gasheva O, Knippa K, Nepiyushchikh Z, Muthuchamy M, Gashev A. Age-Related Alterations of Active Pumping Mechanisms in Rat Thoracic Duct. *Microcirculation*. 2007, 14:8, 827 - 839.
27. Gashev AA, Wang W, Laine, GA Stewart RH, Zawieja DC. Characteristics of the Active Lymph Pump in Bovine Prenodal Mesenteric Lymphatics. *Lymphat Res Biol*. 2007;5(2): 71-79.
28. Behnke B, Zawieja D, Gashev A, Ray C, Delp M. Diminished mesenteric vaso- and venoconstriction and elevated plasma ANP and BNP with simulated microgravity. *J Appl Physiol*. 2008 May;104(5):1273-80. Epub 2008 Jan 24.
29. Davis MJ, Lane MM, Davis AM, Durtschi D, Zawieja DC, Muthuchamy M, Gashev AA. Modulation of Lymphatic Muscle Contractility by the Neuropeptide Substance Am J *Physiol Heart Circ Physiol*. 2008 Aug;295(2):H587-97. Epub 2008 Jun 6.
30. Gashev AA. Lymphatic vessels: Pressure- and Flow-Dependent Regulatory Reactions. *Ann N Y Acad Sci*. 2008 May; 1131:100-109.
31. Petrenko VM, Gashev AA. Observations on the Prenatal Development of Human Lymphatic Vessels with Focus on Basic Structural Elements of Lymph Flow. *Lymphatic Research and Biology*, 2008, *Lymphat Res Biol*. 2008;6(2):89-95.
32. Davis MJ, Davis AM, Lane MM, Ku CW, Gashev AA. Rate-sensitive contractile responses of lymphatic vessels to circumferential stretch. *J Physiol*. 2009 Jan 15;587(Pt 1):165-82. Epub 2008 Nov 10.

33. Davis MJ, Davis AM, Ku CW, Gashev AA. Myogenic constriction and dilation of isolated lymphatic vessels. *Am J Physiol Heart Circ Physiol*. 2009 Feb;296(2):H293-302. Epub 2008 Nov 21.

### **Book Chapters:**

1. Gashev AA, Zawieja DC. Lymph Transport and Lymphatic System. In: *Encyclopedic References in Immunotoxicology*. Springer-Verlag, Germany, 2005. p. 400-403.
2. Zawieja DC, von der Weid P-Y, Gashev AA. Microlymphatic Physiology. In: *Microcirculation: Handbook of Physiology*. Oxford University Press. 2008. Elsevier.

### **Abstracts:**

1. Gashev AA. [Comparison of reactivity of rat main lymphatic vessels.] [Russian] Abstracts of the St. Petersburg City Conference of young scientists. 1985; 80-81.
2. Orlov RS, Borisova RP, Lobov GI, Zverev MD, Moroz VA, Gashev AA. [The nerve regulation of the contractile activity of lymphatic vessels and nodes.] [Russian] Abstracts of the St. Petersburg XII Conference of the physiology and pathology of the nerve regulation. 1986; 188.
3. Gashev AA. [Correlation between parameters of lymphangion productivity and hydrostatic pressure.] [Russian] Abstracts of the St. Petersburg City Conference of young scientists. 1988; 42-43
4. Gashev AA. [The systolic volume of the lymphangion at the conditions of negative gradient of hydrostatic pressure.] [Russian] Abstracts of the First Congress of Kazakhstan physiologists. Alma-Ata, Kazakhstan. 1988; 68.
5. Gashev AA. [Lymphangion pump function in the conditions of perfusion by viscous solutions.] [Russian] Abstracts of the IV Symposium "Venous circulation and Lymph circulation", Alma-Ata, Kazakhstan. 1989; 91-92.
6. Orlov RS, Lobov GI, Borisova RP, Bubnova NA, Gashev AA "Lymphangion - theory, facts, applied aspects" Abstracts of the Satellite symposium to the XXXI International congress of Physiological Sciences. Leningrad, July 1989; 33-34
7. Orlov RS, Borisova RP, Bubnova NA, Erofeev NP, Lobov GI, Petunov SG, Gashev AA. [The pump function of lymphatic vessels at the different pathological conditions.] [Russian] Abstracts of the IY Congress of Pathophysiology. Kishinev, Moldova 1989; 3: 926.
8. Gashev AA. [The Application of the Detectors of Breaking and Short Circuit of Electrical Circuits in the Medico-Biological Experiments] [Russian] Abstracts of the 11 St. Petersburg City Conference "Patents and New Decisions in the Medicine". 1989; 33-34
9. Gashev AA, Petunov SG. [Electrothermostabilization of the Running Solutions]. [Russian] Abstracts of the Conference "Patents and New Decisions in the Medicine". Pirogov State Medical Institute. Moscow. 1990; 47-48
10. Orlov RS, Lobov GI, Gashev AA, Borisova RP, Bubnova NA [Theoretical and Experimental Basis of Clinical Lymphology.] [Russian] Abstracts of the Second Regional Conference. Andizhan, Uzbekistan. 1990; 13-14

11. Orlov RS, Erofeev NP, Gashev AA, Petunov SG. [The mechanisms of regulation of the lymphangions interaction.] [Russian] Abstracts of the VI Symposium "Central regulation of the blood circulation". Rostov, Russia. 1991; 121-123.
12. Orlov RS, Gashev AA, Erofeev NP [The physiological properties of lymphangion under the influence of some drugs.] [Russian] Abstracts of the Symposium "Physiology of visceral systems". St. Petersburg. 1992; 3: 19-24.
13. Gashev AA, Andreevskaya MV [Novocain: influences on the lymphangion pump function.] [Russian] Abstracts of the St. Petersburg State Medical Academy Conference of young scientists. 1993; 10-11.
14. Gashev AA, Andreevskaya MV, Malafeeva EYa. [The types of the contractions and the morphology of mesenteric lymphangions.] [Russian] Abstracts of the St. Petersburg City Conference of young scientists. 1994; 3-4.
15. Andreevskaya MV, Gashev AA. [The influence of antibiotic's solutions on the lymphangion pump function.] [Russian] Abstracts of the St. Petersburg State Medical Academy Conference of young scientists. 1995; 14.
16. Petrov SV, Bubnova NA, Orlov RS, Borisov AV, Borisova RP, Gashev AA, Andreevskaya MV, Karacheva IA. [The influence of the endolymphatic therapy on the morphology and function of the lymphatic vessels.] [Russian] [Angiology and Vascular Surgery – Rus.] 1995. 2. 13.
17. Petrov SV, Bubnova NA, Borisova RP, Andreevskaya MV, Gashev AA [The influence of the antibacterial endolymphatic therapy on the lymphangion function and the volume of lymph flow.] [Russian] Abstracts of the St. Petersburg State Medical Academy Scientific Conference. 1995; 62-63.
18. Orlov RS, Potashev LV, Borisov AV, Bubnova NA, Borisova RP, Petrov SV, Gashev AA, Andreevskaya MV. [The Pathogenic Principles of the Correction of Lymph Flow in the Clinic Practice]. [Russian] Abstracts of the First Russian Congress on Pathophysiology. Moscow, Russia. 1996; 286.
19. Orlov R, Lobov G, Borisova R, Erofeev N, Gashev A, Bubnova N. Lymph transport: theory and practice. Abstracts of the XXXIII International Congress of Physiological Sciences, St. Petersburg, Russia. 1997; L035.08
20. Gashev AA, Andreevskaya MV Lymphangion Pump Function: Influence of Lymph stimulating Drugs. Abstracts of the XXXIII International Congress of Physiological Sciences, St. Petersburg, Russia. 1997; P035.11
21. Orlov RS, Lobov GI, Gashev AA [Mechanoreception in the Lymphatic Vessels] [Russian] Abstracts of the International Symposium "The Problems of Interoception" St. Petersburg, Russia. 1997; 68-70
22. Gashev AA [The Influence of Cardiac Glycosides on the Lymphangion Pump Function.] [Russian] Abstracts of the St. Petersburg City Conference of young scientists. 1997; 23
23. Gashev AA, Semigolovskiy NYu, Andreevskaya MV, Minchenko IB, Orlov RS, Zaborov AM, Serkov VF [Cardiac Glycosides at the Myocardial Ischemia: the Fiasco Mechanisms and Real Alternative.] [Russian] Abstracts of the Scientific Conference "The Prophylaxis and Treatment of Cardio-Vascular Diseases". St. Petersburg, Russia. 1998; 5-6
24. Gashev AA [The Influence of some Cardiac Glycosides on the Lymphangion Pump Function.] [Russian] Abstracts of the St. Petersburg State Medical Academy Scientific Conference. 1998; 38-39

25. Lobov GI, Borisov AV, Borisova RP, Erofeev NP, Gladysheva NA, Petunov SG, Zverev MD, Pankova MN, Gashev AA, Zaharova LB, Krivolesova NA, Kubyushkina NA. [The Change of the Speed of Lymph Transport as an Element of Adaptive Reactions of Body on the Action of Stress Factors] [Russian] Abstracts of the International Symposium "The Problems of Lymphology and Endoecology". Novosibirsk, Russia. 1998; 171-173.
26. Gashev AA, Zawieja DC: Lymphatic contractions: the role of distension mechanisms. *FASEB J* 1999;13:A11.
27. Gashev AA, Zawieja DC: Flow mediated inhibition of the lymph pump in rat microlymphatics. *FASEB J* 2000;14:A8.
28. Lobov GI, Borisova RP, Andreevskaya MV, Gashev AA, Zverev MD, Kubyushkina NA, Pankova MN, Bubnova NA, Petrov SV. [The reactions of the lymphangions on the action of drugs at the endolymphatic therapy]. [Russian]. Abstracts of the Second Russian Congress on Pathology. Moscow. 2000, 279-280.
29. Gashev AA, Zawieja DC, Orlov RS. [The spontaneous contractions of lymphangions: distension as a one from factors modulating a lymph flow]. [Russian]. Abstracts of the Congress of Russian Lymphologists. Moscow. Oct. 25-26, 2000, 29.
30. Gashev AA, Orlov RS. [The retrograde fluid output in lymphangions: the mechanism of formation and importance for clinic]. [Russian]. Abstracts of the Congress of Russian Lymphologists. Moscow. Oct. 25-26, 2000, 137.
31. Gashev AA, Orlov RS, Andreevskaya MV. [Cardiac glycosides, nitroglycerin, antibiotics: influence on the lymphangion pump function ]. [Russian]. Abstracts of the Congress of Russian Lymphologists. Moscow. Oct. 25-26, 2000, 138.
32. Gashev AA, Zawieja DC, Orlov RS. [The flow-dependent regulation of the lymphangion pump function. Role of nitric oxide]. [Russian]. Abstracts of the Congress of Russian Lymphologists. Moscow. Oct. 25-26, 2000, 187.
33. Gashev AA, Orlov RS. [The tendencies in development of the physiology of lymph transport]. [Russian]. Abstracts of the Congress of Russian Lymphologists. Moscow. Oct. 25-26, 2000, 188.
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Grant Reviews:

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Journals Refereed; Book/Chapter Review

1. American Journal of Physiology (Heart, Cell, Regulatory, Gastrointestinal)
2. Microcirculation
3. The Journal of Physiology (London, UK)
4. Journal of Vascular Research,
5. Journal of Applied Physiology
6. Lymphatic Research and Biology
7. Experimental Biology and Medicine
8. Medical Science Monitor