Curriculum Vitae

I. Personal Information

Name: **ALEXANDRU VITALIE KOROTCOV**

Contact Information
Office address:
Howard University
2041 Georgia Ave., NW
HUH Cancer Center, Room B-109
Washington, DC 20060
Office phone: 202-865-3742; Fax: 202-865-3722; Cell phone: 240-672-4772
akorotcov@howard.edu; akorotcov@yahoo.com
USA status: Permanent Resident

Research interests
Molecular Imaging
Biomedical applications using MRI and NMR techniques
Optical Imaging of live cells and animals
Physics of medical imaging
Research and applications in nanoscience and nanotechnology

Career objectives
1. To work at a challenging position meeting competencies, capabilities, skills, education and experience.
2. To make a significant contribution to the field of biomedical research by adapting different imaging methods that are clinically useful and practical for diagnostic and therapeutic purposes.

II. Education and Trainings

Education

2006 – 2008	Postdoctoral Fellow, Molecular Imaging Laboratory, Department of Radiology, Howard University, Washington, DC Field of study: *Biomedical Imaging and Molecular Structural Studies*, *MRI, NMR, Optical Imaging of live cells and animals, Cancer Research (imaging)*
2004 – 2006	Postdoctoral Fellow, National Taiwan University of Science and Technology, Taipei, Taiwan Field of study: *Nanotechnology, Material Research, Physics*
03/21/2003	Conferred the scientific degree of Doctor of Sciences in Physics and Mathematics Ph.D. thesis title: *Investigation of electron states in low dimensional structures based on GaAs/GaAsP*
1996 – 1999	Post-graduate student, Department of Semiconductor Physics, State University of Moldova Field of study: *Semiconductor Experimental and Theoretic Physics, Nanotechnology, Material Research, Physics, Mathematics*
1991 – 1996	MSc in Physics, Department of Semiconductor Physics, State University of Moldova M.Sc. thesis title: *Optical properties of superlattices based on GaAs/GaAs$_{1-x}$P$_x$*

Other trainings and courses

Foundation for Advanced Education in the Science Graduate School at NIH

2008 – 2009	BIOL 317: *Molecular and Cell Biology*
2007 – 2008	BIOTRAC 32: *Nanotechnology in Medicine* STAT 500: *Statistics for Biomedical Scientists* BIOL 101: *Introductory Biology*
2006 – 2007	BIOC 300: *Introductory Biochemistry* IMAG 407: *Biomedical Applications of Magnetic Resonance Imaging (MRI)*

Other workshops and trainings

2011 *Light Scattering Technology: Theory and Applications. Physicochemical characterization of nanoparticles* (theory and hands-on training). Malvern Instruments Inc. September 13, 2011, Howard University Hospital Cancer Center
2011 Grant Writing Seminar Series, Georgetown – Howard Universities Center for Clinical and Translation Science, March 15 – April 26, 2011

2010 *Microscopy Training Program*, July 12-15,GWU Department of Chemistry GWU Washington, DC

2008 *IVIS Spectrum Optical Imaging System Workshop*, HUH Cancer Center, May 5, 2008 Washington, DC
AVANCE Service and Maintenance Course, Bruker Biospin MRI, April 15 – 18, 2008, Billerica, MA
2008 PerkinElmer Inorganic Workshop, April 8, 2008, Adelphi, MD
NMR Concepts & Operating Techniques, The Traficante Series, March 03 – April 5, 2008, Warwick, RI

2007 *Molecular Imaging Fundamentals in Medicine*, Joint Molecular Imaging Conference Pre-Conference Symposium, September 7, 2007, Rhode Island Convention Center, Providence, RI
Small Animal Imaging Hands-On Workshop, Johns Hopkins University, February 7 – 8, 2007, Baltimore, MD

2006 *Introduction to ParaVision*, Bruker Biospin MRI, 09/11-15/2006, Billerica, MA

III. Positions and Honors

Positions and Employment

12/2010 – Assistant Professor, Department of Radiology, Howard University, Washington, D.C.

2009 – Imaging Scientist, Molecular Imaging Laboratory, Department of Radiology, Howard University, Washington, D.C.
Project: *Computational Biology, Bioinformatics, Imaging, and Proteomics Research-RCMI at RCMI Imaging Core Facility (see ongoing projects)*

2006 – 2008 Research Associate, Molecular Imaging Laboratory, Department of Radiology, Howard University, Washington, D.C.
Project: *Biomedical Imaging and Molecular Structural Studies at RCMI Imaging Core Facility*

2004 – 2006 Research Associate, Department of Electronic Engineering, National Taiwan University of Science and Technology, Taiwan
Projects: *1) Preparation and Characterization of IrO_2, RuO_2 and TiO_2 Nanocrystals*
2) Modulation spectroscopy and photoluminescence study of highly strained InGaAs:Sb double quantum wells

2000 – 2004 Research Associate, Laboratory of Semiconductor Physics, State University of Moldova
Project: *Investigation of Low Dimensional Structures Based on GaAs/GaAsP*

2000 – 2004 IT Consultant, Azmol Company LTD, Moldova
Project: *Networking, Hardware and Software Solutions, Architecture of Specific Software*

1996 – 2000 Research Assistant, Laboratory of Semiconductor Physics, State University Moldova
Project: *Growth and Characterization of Low Dimensional Structures Based on GaAs/GaAsP*

Professional Memberships and Committees

2006 – Member of World Molecular Imaging Society

2008 – IEEE Engineering in Medicine and Biology Society (EMBS), Affiliate Member ID#90473804

2008 – 2011 American Association for the Advancement of Science, AAAS# 40256154

2008 – 2010 The New York Academy of Sciences, Member ID#11055980

2007 – 2010 SPIE (The International Society in Optics, Photonics, and Imaging Engineering), Regular Member ID#03165067

2006, 2008 Member of Reviewing Committee of the 2nd and 3rd International Workshops on Modulation Spectroscopy of Semiconductor Structures (Wrocław, Poland)

Honors and appreciations

2010 3rd Place in Abstract Competition – Postdoctoral Fellow category, Howard University College of Medicine, Research Day 2010
2009 Certificate of Merit, The Radiological Society of North America Annual Meeting - RSNA 2009, USA
2006 The best poster, SCTE2006, 15th International Conference on Solid Compounds of Transition Elements, Poland
1998 II Grade Award, The 96/97 Student Conference of USM, Moldova
1996 The appreciation to the very young participant of the International Semiconductor Conference CAS'96, Romania

Teaching

2011 Introduction to Magnetic Resonance Imaging and Spectroscopy (theory and hands-on training): July 25 - 26, 2011. Molecular Imaging Laboratory, Howard University Hospital Cancer Center
2010 2010 Microscopy Training Program: July 12-16. GWU Department of Chemistry GWU and HUH Cancer Center, Washington, DC
Small Animal Imaging of Fluorescent and Bioluminescent Probes
2009 Radiology elective course for senior students (2 lectures every month), Howard University, Washington, DC
1. Evolution of MRI - research and applications (MRI, MRA, DCE-MRI, DTI, fMRI, and MRS)
2. Exploring Research Opportunities in the Department of Radiology

Other Experience and skills

Examination techniques: Magnetic Resonance Imaging (MRI); Nuclear Magnetic Resonance (NMR) spectroscopy; Fluorescence and Bioluminescence imaging of live cells and animals; Dynamic light scattering and zeta potential; Field-Emission Scanning Electron Microscopy (FESEM); X-ray diffraction (XRD); X-ray photoelectron spectroscopy (XPS); Scanning Tunneling Microscopy (STM); Raman spectroscopy; Field emission measurements; Modulation spectroscopy – electro- (CER) and piezo-reflection (PzR), surface photovoltage (SPV); stationary, time resolved and polarized photoluminescence (PL).
Nanostructure fabrication techniques: Small Unilamelar Liposome with targeting ligands preparation, II-VI QDs Synthesis by hot solvent injection method, Solution Phase Au QDs syntheses, Chemical vapor deposition (CVD), Metal-organic chemical vapor deposition (MOCVD), reactive radio frequency (RF) magnetron sputtering.
Tumor Cell Culturing and Animal handling: Culturing MCF-7 and MBA-231 (breast cancer), B16 (melanoma), PC-3M-luc (prostate cancer) cells; mice xenograft models of breast and prostate cancers; intra peritoneal, subcutaneous and intravenous injections; tail vein catheterization in mice; anesthesia (isoflurane).
Theoretical modeling and calculation: Calculation of the electronic states in low dimension structures (multi quantum wells (MQW), superlattices (SL), heterojunction of two superlattices (SLHJ)) based on $GaAs_{1-x}P_x$/ $GaAs_{1-x}P_y$; Modeling of the Raman Shift using modified spatial correlation model, which includes the factor of stress induced shift.
Software and Operating systems: ParaVision (MRI); TopSpin (NMR) {Bruker Biospin MRI, Inc.}; Living Image (Fluorescence and Bioluminescence imaging) {Caliper Lifescience, Inc.}; ImageJ (image analysis) {Rasband WS, ImajeJ, U.S. National Institutes of Health, http://rsb.info.nih.gov/ij/}; MIPAV { Center for Information Technology, National Institutes of Health, http://mipav.cit.nih.gov/index.php}; WiRE2 SP8 (Raman spectroscopy) { http://www.renishaw.com/en/6260.aspx }; CaRIne Crystallography 3.1 (Crystallographic software) {http://pagespro-orange.fr/ carine.crystallography/}; OriginPro 7 (engineer graphics, analysis and statistics) {OriginLab Corporation, http://www.originlab.com }; Programming in Fortran, Pascal,C++, MathCad; Windows 95/98/2000 NT SERVER/XP; Red Hat LINUX; Microsoft Office; Dreamweaver; Front Page; Photoshop; CorelDraw.

IV. Selected Peer-reviewed publications

Papers (papers selected from 38 peer-reviewed publications)

1. **Alexandru V. Korotcov**, Yunpeng Ye, Yue Chen, Fayun Zhang, Sophia Huang, Stephen Lin, Rajagopalan Sridhar, Samuel Achilefu, Paul C. Wang. Glucosamine Linked Near-infrared Fluorescent Probes for Imaging of Solid Tumor Xenograft. Molecular Imaging and Biology, 2011, DOI: 10.1007/s11307-011-0520-4, in press.
2. Meng H, Xing G, Blanco E, Song Y, Zhao L, Sun B, Li X, Wang PC, **Korotcov A**, Li W, Liang XJ, Chen C, Yuan H, Zhao F, Chen Z, Sun T, Chai Z, Ferrari M, Zhao Y. Gadolinium Metallofullerenol Nanoparticle Inhibits Cancer Metastasis through Matrix Metalloproteinase Inhibition: Prison Instead of Poison Cancer Cells. Nanomedicine, 2011, doi:10.1016/j.nano.2011.08.019, in press.
3. T. Wang, R. Sridhar, **A. Korotcov**, A.H. Ting, K. Francis, J. Mitchell, P.C. Wang. Synthesis of amphiphilic triblock copolymers as multidentate ligands for biocompatible coating of quantum dots. Colloid and Surfaces A: Physicochem. Eng. Aspects, 375(1-3), 2011, pp 147-155.
4. **Alexandru Korotcov**, Liang Shan, Huan Meng, Tongxin Wang, Rajagopalan Sridhar, Yuliang Zhao, Xing-Jie Liang, and Paul C. Wang. A Nanocomplex System as Targeted Contrast Agent Delivery Vehicle for MRI Dynamic Contrast Enhancement Study, *Journal of Nanoscience and Nanotechnology*, 10(11), 2010, pp 7113-7116.
5. **Alexandru Korotcov**, Reui-San Chen, Ying-Sheng Huang, Dah-Shyang Tsai, Kwong-Kau Tiong. Conductive Iridium Dioxide (IrO_2) Nanocrystals. *Chapter 37 in Encyclopedia of Nanoscience and Nanotechnology*: American Scientific Publishers, 2010, www.aspbs.com/enn/, in press.
6. Yubin Hao, Tianpei Xie, **Alexandru Korotcov**, Yanfei Zhou, Xiaowu Pang, Yinhan Guo, Hongguang Ji, Liang Shan, Paul Wang, Joseph Califano, Xinbin Gu. Salvianolic Acid B Inhibits Growth of Head and Neck Squamous Cell Carcinoma in vitro and in vivo via Cyclooxygenase-2 and Apoptotic Pathways. *Int. J. of Cancer*, 124, 2009, pp 2200-2209.
7. Shan L, Wang SP, **Korotcov A**, Wang PC. Transferrin Liposome Nanoparticle (Tf^{NIR}-Lip^{NBD}-Magnevist) – A Tumor Targeting MRI Contrast Agent. Acta Biophysica Sinica 24(4) August 2008, pp 315-322.
8. Liang Shan, Songping Wang, **Alexandru Korotcov**, Rajagopalan Sridhar, Paul C. Wang. Bioluminescent Animal Models of Human Breast Cancer for Tumor Biomass Evaluation and Metastasis Detection. *Ethnicity & Disease*, **18**, 2008, p.(S2)65-69.
9. Liang Shan, Yubin Hao, Songping Wang, **Alexandru Korotcov**, Renshu Zhang, Tongxin Wang, Joseph Califano, Xinbin Gu, Rajagopalan Sridhar, Zaver M. Bhujwalla, Paul C. Wang Visualizing Head and Neck Tumors In Vivo Using Near-Infrared Fluorescent Transferrin Conjugate. *Molecular Imaging*, **7**, No 1, 2008, pp 42-49.
10. C.A. Chen, Y.M. Chen, **A. Korotcov**, Y.S. Huang, D.S. Tsai, K.K. Tiong. Growth and characterization of well-aligned densely-packed rutile TiO_2 nanocrystals on sapphire substrates via metal–organic chemical vapor deposition, *Nanotechnology* ,**19**, 2008, 075611 (5pp) doi:10.1088/0957-4484/19/7/ 075611.

Selected Abstracts and Presentations (selected from 43 abstracts and presentations)

1. **Korotcov AV**, Wang T, Chen Y, Sridhar R, Mitchell J, Wang PC. Study of TOPO-Quantum Dot Degradation by 31P NMR. 2011 World Molecular Imaging Congress September 7-10, 2011, San Diego, California, P159.
2. **Korotcov AV**, Ishibashi N, Korotcova L, Chen Y, Stephen L, Scafidi J, Murata A, Zurakowski D, Gallo V, Jonas RA, Wang PC. Use of MRI, MRS and DTI to Assess Cerebral White Matter Cellular Response to Cardiopulmonary Bypass in a Porcine Bypass Survival Model. Howard Univerity College of Medicine Research Day 2010, Howard Univerity, Washington, DC, April 15 2011, p.63.
3. **Korotcov AV**, Ye Y, Chen Y, Sridhar R, Achilefu S and Wang PC. Glucosamine Linked Near-infrared Fluorescent Probes for Noninvasive Imaging of Solid Tumor Xenografts. 2010 World Molecular Imaging Congress September 8-11, 2010 Kyoto, Japan, 0826A.
4. Ye Y, **Korotcov AV**, Xu B, Bloch S, Chen Y, Wang PC, Achilefu S. Novel Divalent Disulfide-based Cyclic RGD Peptides for Integrin-targeted Tumor Optical Imaging. 2010 World Molecular Imaging Congress September 8-11, 2010 Kyoto, Japan, 0828B.

5. **Korotcov AV**, Ye Y, Chen Y, Sridhar R, and Wang PC. Glucosamine based near-infrared fluorescent probes for non invasive imaging of tumors in live mice. Howard Univerity College of Medicine Research Day 2010, Howard Univerity April 20, 2010, Washington, DC, p.16.
6. V.K. Bhatia, B.C. Davis, **A.V. Korotcov**, A J Duerinckx. Myocardial Iron Overload: Why Is It Important and How to Measure It? The Radiological Society of North America Annual Meeting - RSNA 2009, November 29 - December 4, 2009, McCormick Place, Chicago, IL, code: LL-CA2622.
7. **Alexandru Korotcov**, Liang Shan, Paul C. Wang. A Nanocomplex System as Targeted Contrast Agent Delivery Vehicle for MRI Dynamic-Contrast-Enhancement Study. The International Conference on Nanoscience and Technology, China 2009, September 1-3, 2009, Beijing, China, p.94.
8. **Alexandru V. Korotcov**, Liang Shan, Songping Wang, Tongxin Wang, Yue Chen, Rajagopalan Sridhar, Zaver M. Bhujwalla, and Paul C. Wang. Dynamic Contrast Enhanced MRI of Solid Tumor Xenografts using Transferrin-conjugated Liposomal Nanocomplex. Howard Univerity Nanosymposium, Howard Univerity 20-21 November, 2008, Washington, DC, p.16 (**speaker**).
9. **Alexandru V. Korotcov**, Liang Shan, Songping Wang, Tongxin Wang, Rajagopalan Sridhar, Zaver M. Bhujwalla, Paul C. Wang. Targeted DCE-MRI for Imaging and Characterization of Solid Tumor Xenografts. The fifth Era of Hope Meeting 2008 of the DOD Breast Cancer Research Program, Baltimore Convention Center June 25, 2008 - June 28, 2008, Baltimore, MD, p.280 (**speaker**).
10. Liang Shan, Songping Wang, Yanfei Zhou, **Alexandru V. Korotcov**, Renshu Zhang, Tongxin Wang, Rajagopalan Sridhar, Zaver M. Bhujwalla, Paul C. Wang. Targeted Fluorescent Liposome Nanoparticles for Molecular Imaging of Breast Cancer Xenografts in Mouse. The fifth Era of Hope Meeting 2008 of the DOD Breast Cancer Research Program, Baltimore Convention Center June 25, 2008 - June 28, 2008, Baltimore, MD, p.281.
11. Tongxin Wang, Liang Shan, **Alexandru V. Korotcov**, Songping Wang, Yanfei Zhou, Paul C. Wang. Surface Coating and Bioconjugation of Quantum Dots for Non-invasive Detection of Breast Cancer. The fifth Era of Hope Meeting 2008 of the DOD Breast Cancer Research Program, Baltimore Convention Center June 25, 2008 - June 28, 2008, Baltimore, MD, p.281.
12. P. Wang, L. Shan, S. Wang, **A. Korotcov**, T. Wang. Molecular Imaging of Solid Tumor in Small Animal Using a Dual Fluorescent and MRI Probe. Biomedical Research Opportunities Workshop V, January 17 - 19, 2008 at the Bethesda North Convention Center, Rockville, MD, abstract ID 8087.
13. **Alexandru V. Korotcov**, Liang Shan, Songping Wang, Rajagopalan Sridhar, Zaver M. Bhujwalla, Paul C. Wang. Targeted MR Imaging of Solid Tumor Xenografts using Liposomal Nanocomplex. Howard Univerity Nanosymposium, Howard Univerity 5-6 November, 2007, Washington, DC, p.21 (**speaker**).
14. Tongxin Wang, Liang Shan, **Alexandru Korotcov**, Songping Wang, Yanfei Zhou, Paul Wang. Encapsulation and Bioconjugation of Quantum Dots for Non-invasive Detection of Tumor. Howard Univerity Nanosymposium, Howard Univerity 5-6 November, 2007, Washington, DC, p.22.
15. Paul C. Wang, Liang Shan, Yubin Hao, Songping Wang, Dan Zhang, **Alexandru Korotcov**, Tongxin Wang, Xinbin Gu. Optical Imaging of Head and Neck Squamous Cell Carcinoma Xenografts Using Near-infrared Fluorescent Transferrin Conjugate. Joint Molecular Imaging Conference, September 8-11, 2007, Rhode Island Convention Center, Providence, RI, p.318.

Papers under Review & in Preparation

1. T. Wang, A. Korotcov, Y. Chen, P.C. Wang, A.H. Ting, K. Francis, J. Mitchell, C. Klug, R. Sridhar. A ^{31}PNMR Study of the Interaction of TOPO-QDs with Mercaptoethanol.
2. Fayun Zhang, Liang Shan, Yue Chen, Alexandru Korotcov, Stephen Lin, Sophia Huang, Wei Liang, Paul C Wang. Anti-PSMA fold-back diabody fusion diphtheria immunotoxin expresses selectivity for prostate cancer imaging and therapy.

Seminars and Lectures

02/09/2011 HUH Cancer Center, Washington, DC, Molecular Imaging Seminar Series:
Use of MRI/MRS to assess white matter development including injury, recovery, and maturation of white matter: DTI and Spectroscopy Analysis

09/28/2010 HUH Cancer Center, Washington, DC, Molecular Imaging Seminar Series:
Magnetic Resonance Imaging of Alzheimer's Pathology in the Brains of Living Transgenic Mice: Overview.

12/21/2007 HUH Cancer Center, Washington, DC, Molecular Imaging Seminar Series:
Validating of in vivo Bioluminescence Imaging as a Quantitative Modality for Solid Tumor Xenografts.

09/21/2007 HUH Cancer Center, Washington, DC, Molecular Imaging Seminar Series:
Potential of QDs targeted delivery by QD-streptavidin-biotin-Tf complexes.

06/19/2007 HUH Cancer Center, Washington, DC, Molecular Imaging Seminar Series:
MRI and MS application in detection of prostate cancer in transgenic mouse.

11/28/2006 HUH Cancer Center, Washington, DC, Molecular Imaging Seminar Series:
An introduction to diffusion tensor magnetic resonance imaging and its application.

05/05/2006 National Taiwan University of Science and Technology, Taipei, Taiwan, Electronic and Chemical Engineering Departments Meeting Series:
Growth and characterization of well aligned RuO_2 nanostructures by reactive sputtering.

10/01/2005 National Taiwan University of Science and Technology, Taipei, Taiwan, Electronic and Chemical Engineering Departments Meeting Series:
The growth and characterization of IrO_2 1D nanocrystals on sapphire substrates.

05/01/2005 National Taiwan University of Science and Technology, Taipei, Taiwan, Electronic and Chemical Engineering Departments Meeting Series:
Development of growth and characterization of reactive sputtered IrO_2 1-D nanostructures

12/03/2004 National Taiwan University of Science and Technology, Taipei, Taiwan, Electronic and Chemical Engineering Departments Meeting Series:
The investigation of substrate effect on the growth of IrO_2 1-D nanocrystals.

04/09/2002 Institute of Physical Chemistry, University of Mainz, Mainz, Germany, Prof. Thomas Basche Research Group Seminars:
Investigation of electron states in low dimensional structures based on GaAs/GaAsP.

Ongoing Projects

1. *Tumor-targeted MR Contrast Enhancement Using Molecular Imaging Techniques*; Drs. Wang PC, Korotcov AV, Radiology, Howard University, Dr. Bhujwalla Z, Department of Radiology, The Johns Hopkins University School of Medicine.
2. *White Matter Development after Neonatal Cardiac Surgery in a Swine Survival Model; Evaluation of Injury, Recovery, and Maturation*; Drs. Jonas RA, Ishibashi N, Children's National Medical Center; Dr. Korotcov A, Lin S, Radiology, Howard University.
3. *MRI analysis to evaluate effects of HGS compounds in Experimental Autoimmune Encephalomyelitis* (Dr. Oh L, Human Genome Sciences Inc; Drs. Wang PC, Korotcov A, Radiology, Howard University.

Completed Projects (5 years)

1. *Monitoring Thiol Mediated Degradation of TOPO-Quantum Dots by 31P NMR Spectroscopy.*
2. *Tumor Optical Imaging of Glucosamine Linked Fluorescent Probes in Mice.*
3. *Dynamic Contrast Enhanced MRI of Solid Tumor Xenografts using Transferrin-conjugated Liposomal Nanocomplex.*

Fundings

1. Computational Biology, Bioinformatics, Imaging, and Proteomics Research-RCMI {Role: Imaging Scientist} (NIH/NCRR/RCMI, Dr. Robert Taylor, PI)
2. A Partnership Training Program In Breast Cancer Research Using Molecular Imaging Techniques {Role: co-PI} (US Army Medical Commend, USAMRMC, Paul C Wang, PI)

V. References

Rajagopalan Sridhar, Professor, Ph.D., Department of Radiation Oncology and Cancer Center, Howard University, 2041 Georgia Ave., N.W., Washington, DC 20060. rajsridhar@yahoo.com; 401-279-8479
Liang Shan, Scientific Imaging Editor (MICAD), NCBI, National Institute of Health, Bethesda, MD. shanliang1964@gmail.com; 301-402-8389
Stanley Fricke, Ph.D., Associate Professor (GWU), MRI Physicist at Children's National Medical Center, sfricke@childrensnational.org; 202-476-6029