

CURRICULUM VITAE
Yuri Karl Peterson, PhD
July, 2011

Campus Address

Medical University of South Carolina
College of Pharmacy
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Education and Training

- 1996 B.Sc., Molecular Biology/Plant Biotechnology
Salem-Teikyo University (Salem International), Salem, WV
Minor in Chemistry and European Studies
- 1998-2001 M.Sc., Cell and Molecular Pharmacology and Experimental
Therapeutics
Medical University of South Carolina, Charleston, SC
Mentor: Stephen Lanier
Thesis: *Analysis of the G-protein Regulatory (GPR) Domain of
the Activator of G-protein Signaling 3*
- 2001-2004 Ph.D., Pharmacology and Experimental Therapeutics
Louisiana State University Health Sciences Center, New Orleans,
LA
Mentor: Stephen Lanier
Dissertation: *Studies on the G-protein Regulatory Domain*
- 2004-2008 Research Associate (Post-Doctoral), Department of
Pharmacology and Cancer Biology/Center for Chemical Biology
Duke University Medical Center, Durham, NC
Mentor: Patrick Casey
*Enzyme, inhibitor, molecular, and cell biology studies of CaaX
pathway processing enzymes*

Professional Experience

- 1996-1998 Research Assistant
Department of Cell and Molecular Pharmacology and
Experimental Therapeutics, Mass Spectrometry Facility
Medical University of South Carolina, Charleston, SC
Mentor: Dr. Kevin Schey
Mass spectrometric analysis of human lens crystallins
- 2008-2009 Research Assistant Professor

Department of Pharmaceutical and Biomedical Sciences, Drug
Discovery Core, Medical University of South Carolina, Charleston,
SC

2009-present Assistant Professor (Tenure Track)
Department of Pharmaceutical and Biomedical Sciences
Medical University of South Carolina, Charleston, SC

Specialized Training

June, 2006 *3D-Quantitative Structure Activity Relationships (3D-QSAR)*
Department of Pharmacy, National University of Singapore
Mentor: Go Mei Lin

2006-2008 *2D-Quantitative Structure Activity Relationships (2D-QSAR)*
Department of Pharmacy, University of North Carolina, Chapel
Hill, NC
Mentor: Alexander Tropsha

2010 Pfizer Oncology 3D (Drug Discovery and Development)
Simulation, Role: Phase II Clinician

Teaching Experience

2002-2003 Lecturer, School of Nursing
Louisiana State University Health Sciences Center, New Orleans,
LA
Pharmacology curriculum

2009-present Lecturer, College of Graduate Studies,
Medical University of South Carolina, Charleston, SC
Topics include: cancer therapeutics, drug discovery,
cheminformatics, bioorganic chemistry, pharmacology

2009-present Lecturer, College of Pharmacy and College of Graduate Studies
Medical University of South Carolina, Charleston, SC
Topics include: cancer therapeutics, drug discovery,
pharmacology, and pharmaceuticals (inhaled dosage forms,
advanced dosage forms, transdermals, biologics, diagnostics, and
radiopharmaceuticals)

Mentorship Experience

2007 Duke Summer Research Opportunity Program (SROP)
Jason Williams (Duke University student)
Proteomic analysis of prenyl-binding protein

2009 MUSC Summer Undergraduate Research Program (SURP)
Laura Leathers (Erskine University student)
Inhibitors of AGS3 Translocation

- 2009 – present Mentor, MUSC College of Graduate Studies (Kevin Bigham and Richard Trager – Co-mentored with Dr. Charles Smith and Dr. Rick Schnellman)
- 2010 Student Mentor, St. Andrew's (Middle) School of Math and Science
- 2010 MUSC Summer Undergraduate Research Program (SURP)
Emily Johnson (Clemson University student)
Novel Binding Partners of PTEN
- 2011 Summer Undergraduate Research Program (SURP)
Allie Pinsoki (Porter Gaud High School)
Victor Lee (Georgia Institute of Technology)

Honors and Awards

- 1994 Outstanding Student Leadership Award, Salem-Teikyo University
- 2000 First Place, Student Research Day, Masters Poster Presentation, Medical University of South Carolina
- 2001 Invited Student Speaker, Molecular Pharmacology Division, Gordon Research Conference (Ventura, CA)
- 2002 Second Place, Best Student Paper Competition, Experimental Biology 2002 (New Orleans, LA)
- 2002 Third Place, Graduate School Research Day Poster Session, Louisiana State University Health Sciences Center
- 2002 Young Scientist Award, Pharmacology of Adrenoceptors Symposium, Satellite meeting to XIVth World Congress of Pharmacology- IUPHAR 2002 (San Francisco, CA)
- 2003 Graduate Student Travel Award, American Society for Pharmacology and Experimental Therapeutics, Experimental Biology 2003 (San Diego, CA)
- 2003 Coulson-Dessauer Achievement Award, Louisiana State University Health Sciences Center
- 2006 Best Abstract and Poster Award for Excellence in Cancer Research, Duke Comprehensive Cancer Center Symposia
- 2006 Young Scientist Travel Award, American Society for Pharmacology and Experimental Therapeutics, XVth World Congress of Pharmacology- IUPHAR 2006 (Beijing, China)
- 2008 Best Abstract and Poster Award for Excellence in Cancer Research, Duke Comprehensive Cancer Center Symposia

2008 Young Scientist Award, American Society for Pharmacology and Experimental Therapeutics: Division for Drug Discovery, Development, and Regulatory Affairs - Experimental Biology 2008 (San Diego, CA)

Organizations/Affiliations

2003-present American Society for Pharmacology and Experimental Therapeutics (ASPET)
2009-present American Chemical Society (ACS)
2010-present Affiliate Member, Hollings Cancer Center Developmental Therapeutics Cancer Research Group

Community Involvement

2002-2004 Student mentor & science fair judge, McDonogh 7 Elementary School, New Orleans, LA
2006-2007 Student Mentor, E.K. Powe Elementary School, Durham, NC
2006-2007 Science Fair Judge, Duke University, Durham, NC
2009-present Science Fair Judge, Medical University of South Carolina, Charleston, SC
2009-present Science Fair Judge, St. Andrew Elementary School of Math and Science, Charleston, SC

Funding

Completed Research Support

2005-2007 NIH Ruth L. Kirschstein (F32-GM073420) National Research Service Award
Title: *Structure and Function of ICMT Methyltransferase*

Ongoing Research Support

2009-2012 Tenure Track Faculty Start-up Package: Peterson (PI)
Medical University of South Carolina, College of Pharmacy, Department of Pharmaceutical and Biomedical Sciences
2011-2012 Medical U. of South Carolina-Hollings Cancer Center-American Cancer Society-Institutional Research Grant: Peterson (PI)

Patents

Methods for Treating Glaucoma and Macular Degeneration, Serial Number 11/716,724-3/2007

Geranylgeranyl Transferase Inhibitors and Methods of Making and Using the Same, Serial Number 12/679,604-3/2010

Publications

- 1) **Y K Peterson**, ML Bernard, H Ma, S Hazard III, SG Graber, and SM Lanier. Stabilization of the GDP-bound Conformation of G α by a Peptide Derived from the G-protein Regulatory Motif of AGS3. *Journal of Biological Chemistry*, 2000, 275:33193-33196.
- 2) M Natochin, B Lester, **YK Peterson**, ML Bernard, SM Lanier, and NO Artemyev. AGS3 Inhibits GDP Dissociation from G α Subunits of the G $_i$ Family and Rhodopsin-Dependent Activation of Transducin. *Journal of Biological Chemistry*, 2000, 275:40981-40985.
- 3) ML Bernard, **YK Peterson**, P Chung, J Jourdan, and SM Lanier. Selective Interaction of AGS3 with G-proteins and the Influence of AGS3 on the Activation State of G-proteins. *Journal of Biological Chemistry*, 2001, 276:1585-1593.
- 4) **YK Peterson**, S Hazard III, SG Graber, and SM Lanier. Identification of Structural Features in the GPR motif Required for Regulation of Heterotrimeric G-proteins. *Journal of Biological Chemistry*, 2002, 277:6767-6770.
- 5) JB Blumer, ML Bernard, **YK Peterson**, P Chung, and SM Lanier. Phosphorylation of GPR Domains in AGS3 by the Tumor Suppressor Kinase LKB1 and the Influence of Phosphorylation on the Interaction of GPR Motifs with Heterotrimeric G-proteins. *Journal of Biological Chemistry*, 2003, 278:23217-23220.
- 6) M Gotta, Y Dong, **Y Peterson**, S Lanier, and J Ahringer. C. elegans Homologues of AGS3/PINS Control Spindle Position in the Early Embryo. *Current Biology*, 2003, 13:11029-11037.
- 7) H Ma, **YK Peterson**, ML Bernard, SM Lanier, and SG Graber. Influence of Cytosolic AGS3 on Receptor G-protein Coupling. *Biochemistry*, 2003, 42:8085-8093.
- 8) M Ghosh, **YK Peterson**, SM Lanier, and AV Smrcka. Receptor and Nucleotide Exchange Independent Mechanisms for Promoting G-protein Subunit Dissociation. *Journal of Biological Chemistry*, 2003, 278:34747-34750.
- 9) MS Bowers, RW Lake, K McFarland, **YK Peterson**, SM Lanier, CC Lapish, and PW Kalivas. AGS3: A G-protein Regulator of Addiction-Associated Behaviors. *Annals of the New York Academy of Sciences*, 2003, 1003:356-357.
- 10) MS Bowers, RW Lake, K McFarland, **YK Peterson**, SM Lanier, CC Lapish, and PW Kalivas. AGS3: A Cocaine Addiction Gatekeeper. *Neuron*, 2004, 42:269-281.
- 11) **YK Peterson**, AM Winter-Vann, and PJ Casey. ICMT. The Alliance for Cellular Signaling (AfCS)-Nature Molecule Pages, 2005. (doi:10.1038/mp.a001154.01)
- 12) KS Song, **YK Peterson**, A Friedman, and SM Lanier. Identification and Characterization of a G-protein Regulatory Motif in WAVE1. *FEBS Letters*, 2006, 580:1993-1998.
- 13) **YK Peterson**, P Kelly, CA Weinbaum, and PJ Casey. A Novel Protein Geranylgeranyltransferase-I Inhibitor with High Potency, Selectivity and Cellular Activity. *Journal of Biological Chemistry*, 2006, 281:12445-12450.

- 14) MJ Roberts, JM Troutman, KA Chehade, HC Cha, JP Kao, X Huang, CG Zhan, **YK Peterson**, T Subramanian, S Kamalakkannan, DA Andres, and HP Spielmann. Hydrophilic Anilino geranyl Diphosphate Prenyl Analogues are Ras Function Inhibitors. *Biochemistry*, 2006, 45:15862-15872.
- 15) RA Baron, **YK Peterson**, JC Otto, J Rudolph, and PJ Casey. Time-Dependent Inhibition of Isoprenylcysteine Carboxylmethyltransferase by Indole-Based Small Molecules. *Biochemistry*, 2007, 46:554-560.
- 16) V Rao, **YK Peterson**, P Deng, and PJ Casey. Effects of pharmacologic inhibition of protein geranylgeranyltransferase type I on aqueous humor outflow through the trabecular meshwork. *Investigative Ophthalmology & Visual Science*, 2008, 49:2464-2471. PMID: PMC2561264
- 17) **YK Peterson**, S Wang, PJ Casey, and A Tropsha. Discovery of Geranylgeranyltransferase-I Inhibitors with Novel Scaffolds by the Means of Quantitative Structure-Activity Relationship Modeling, Virtual Screening, and Experimental Validation; *Journal of Medicinal Chemistry*, 2009, 52:4210-4220. PMID: PMC2726652
- 18) H Zhu, DI Appel, **YK Peterson**, Z Wang, and JS Markowitz. Novel Approaches to Identifying Potential Inhibitors of Methylphenidate Metabolism: Results of Preliminary Study. *Toxicology*, 2010, 270:59-65.
- 19) K. Appleton, I. Cushman, and **Y.K Peterson**. Isoprenylcysteine carboxylmethyltransferase. *Encyclopedia of Signaling Molecules*, invited review – in press

Abstracts and Presentations

- 1999 **Yuri K. Peterson**, Govindan Vaidyanathan, Timothy Vincent, Paige Newton, Dale E. Edmondson, and Stephen M. Lanier
Subpopulations of Monoamine Oxidase B as Defined by Charge and Accessibility of Ligand Binding Domains
Student Research Day, Medical University of South Carolina
- 2000 **Yuri Peterson**, Mike Bernard, and Stephen Lanier
Defining the G-protein Regulatory (GPR) Motif: Structure, Function and Specificity
Department of Cell and Molecular Pharmacology and Experimental Therapeutics Seminar Series, Medical University of South Carolina
- 2000 **Yuri K. Peterson**, Michael L. Bernard, Hongzheng Ma, Starr Hazard, III, Stephen G. Graber, and Stephen M. Lanier
Stabilization of the GDP-bound Conformation of G α by a Peptide Derived from the G-protein Regulatory Motif of AGS3
Student Research Day, Medical University of South Carolina
- 2001 **Yuri K. Peterson**, Michael L. Bernard, Hongzheng Ma, Starr Hazard III, Stephen G. Graber, and Stephen M. Lanier
Stabilization of the GDP-bound Conformation of G α by a Peptide Derived from the G-protein Regulatory Motif of AGS3
Invited Speaker and Poster Presentation, Molecular Pharmacology Division, Gordon Research Conference (Ventura, CA)

- 2001 **Yuri K. Peterson**, Starr Hazard III, Stephen G. Graber, and Stephen M. Lanier
Analysis of the G-protein Regulatory (GPR) Domain of the Activator of G-protein Signaling 3
Department of Cell and Molecular Pharmacology and Experimental Therapeutics Seminar Series, Louisiana State University Health Sciences Center
- 2002 **Yuri K. Peterson**, Starr Hazard III, Stephen G. Graber, and Stephen M. Lanier
The GPR Motif as a GDI for Heterotrimeric G-proteins: Identification of Residues required for Interaction, Regulation and Selectivity
Experimental Biology 2002 (New Orleans, LA), and Graduate School Research Day, Louisiana State University Health Sciences Center
- 2002 **Yuri K. Peterson**, Joe B. Blumer, Motohiko Sato, and Stephen M. Lanier
Synthesis and Characterization of Membrane Permeable Derivatives of Peptides Containing the G-protein Regulatory Motif
XIVth World Congress of Pharmacology- IUPHAR 2002 and Pharmacology of Adrenoceptors 2002 Symposium (San Francisco, CA)
- 2002 **Yuri K. Peterson**, and Stephen M. Lanier
The G-protein Regulatory Motif: A Novel Target for Manipulation of G-protein Signaling Systems
Department of Cell and Molecular Pharmacology and Experimental Therapeutics Seminar Series, Louisiana State University Health Sciences Center
- 2003 **Yuri K. Peterson**, Stephen M. Lanier, and Joe B. Blumer
Phosphorylation of AGS3 in the GPR Domain: Serine Phosphorylation within the GPR Consensus Sequence Inhibits G-protein Interaction
Molecular Pharmacology Division, Gordon Research Conference (Ventura, CA), and Experimental Biology 2003 (San Diego, CA), and Louisiana State University Health Sciences Center Graduate School Research Day
- 2003 Joe B. Blumer, **Yuri K. Peterson**, Michael L. Bernard, Peter Chung and Stephen M. Lanier
Phosphorylation of AGS3 by the Tumor Suppressor LKB1: A Potential Mechanism for Regulation of AGS3-Gi α Interaction
Experimental Biology 2003 (New Orleans, LA)
- 2003 **Yuri K. Peterson**
Regulation of G-proteins by Accessory Proteins: The G-protein Regulatory Motif
Invited speaker: Duke Center for Chemical Biology (Durham, NC), University of North Carolina Department of Pharmacology (Chapel Hill, NC), and Weiss Center of the Geisinger Clinic (Danville, PA)
- 2004 **Yuri K. Peterson**, Ian Cushman, and Patrick J. Casey
Structure and Function of Isoprenylcysteine Carboxymethyltransferase
Duke University Medical Center Pharmacology Retreat (Wrightsville Beach, NC)
- 2005 **Yuri K. Peterson**, Carolyn A. Weinbaum, and Patrick J. Casey
A Novel Protein Geranylgeranyltransferase-I Inhibitor with High Potency, Selectivity and Cellular Activity

Duke University Medical Center Pharmacology Retreat (Wrightsville Beach, NC)

- 2006 **Yuri K. Peterson**, Patrick Kelly, Carolyn A. Weinbaum, and Patrick J. Casey
A Novel Protein Geranylgeranyltransferase-I Inhibitor with High Potency, Selectivity and Cellular Activity
XVth World Congress of Pharmacology- IUPHAR 2006 (Beijing, China), FASEB Summer Conference on Protein Lipidation, Signaling and Membrane Domains (Palm Springs, CA), Duke Comprehensive Cancer Center Symposia (Durham, NC), and Duke University Medical Center Pharmacology Retreat (Wrightsville Beach, NC)
- 2006 Peifeng Deng, **Yuri Peterson**, Patrick Casey, and Vasanth Rao
Pharmacological Inhibition of Protein Geranylgeranyltransferase Type I (GGTase-I) by GGTI-DU40 Increases Aqueous Humor Outflow in Perfused Porcine Eyes
ARVO 2006 (Fort Lauderdale, FL)
- 2007 **Yuri Peterson**, Simon Wang, Patrick Casey, and Alexander Tropsha
Application of Consensus QSAR and Virtual Screening in the Discovery of Geranylgeranyltransferase Inhibitors
Duke University Medical Center Pharmacology Retreat (Wrightsville Beach, NC)
- 2007 **Yuri Peterson**, Simon Wang, Patrick Casey, and Alexander Tropsha
Discovery of Novel Geranylgeranyltransferase Inhibitors through Virtual Database Mining
Microsoft eScience 2007 (Chapel Hill, NC)
- 2008 **Yuri Peterson**, Simon Wang, Patrick Casey, and Alexander Tropsha
Discovery of Novel Protein Geranylgeranyltransferase Inhibitor Scaffolds
Duke Comprehensive Cancer Center Symposia (Durham, NC)
- 2008 **Yuri Peterson**, Simon Wang, Patrick Casey, and Alexander Tropsha
Advantage of 2D-QSAR in the discovery of novel protein geranylgeranyltransferase inhibitor (GGTI) scaffolds
Experimental Biology 2008 (San Diego, CA)
- 2009 Jill Kyzer, **Yuri K. Peterson**, and Justin K. Wyatt
Development of a Novel Anticancer Agent Modeling Combretastatin A-4 Using Quantitative Structure Activity Relationships
SERMACS 2009 (Puerto Rico)
- 2009 Laura A. Leathers, Ali Vural, Stephen M. Lanier, and **Yuri K. Peterson**
Novel Compounds That Effect the Translocation of AGS3 Protein Found Using a High Content/High Throughput Screen
SERMACS 2009 (Puerto Rico)
- 2010 Kevin J. Bigham, Starr Hazard, Ellen Maher, Joe Blumer, and **Yuri K. Peterson**
Development of Selective Small Molecule Inhibitors of Heterotrimeric G-Protein Signaling for the Treatment of Ovarian Cancer
MUSC Student Research Day (Charleston, SC)

- 2010 Richard E. Trager, Lauren Wills, Christopher Lindsey, Craig Beeson, Rick Schnellmann, and **Yuri K. Peterson**
High Throughput Virtual Drug Discovery for Novel and Future Compounds that Cause Mitochondrial Toxicity
 MUSC Student Research Day 2010 (Charleston, SC)
- 2011 **Yuri K Peterson**
 Invited Speaker: High Performance Computing-Getting Started Workshop
 Talk Title: High-Throughput Computational Drug Discovery
 Medical University of South Carolina, Charleston, SC
- 2011 Lauren P. Wills, Richard Trager, Gyda G. Beeson, G.C., Chris Lindsey, Craig C. Beeson, **Yuri K Peterson**, and Richard G. Schnellmann
Identification and characterization of mitochondrial toxicants
 Fiftieth Annual Meeting for the Society of Toxicology, Washington, D.C.
- 2011 Richard Trager, Lauren Wills, Christopher Lindsey, Gyda Beeson, Craig Beeson, Rick Schnellmann, and **Yuri Peterson**
High Throughput Identification of Mitochondrial Toxicophores
 Experimental Biology 2011, Washington DC
- 2011 Kevin Bigham, Starr Hazard, Jonel Lirjoni, Ellen Maher, Joe Blumer, and **Yuri K. Peterson**
Development of Selective Small Molecule Inhibitors of Heterotrimeric G-Protein Signaling for the Treatment of Ovarian Cancer
 Experimental Biology 2011 and RGS & AGS Proteins in Physiology and Disease Symposia, Washington DC

References

Dr. Charles Smith (faculty mentor and collaborator)
 Director, Drug Discovery Core, and Charles and Carol Cooper Chair in Pharmacy
 Medical University of South Carolina, Charleston, SC
 843.792.3420
 smithchd@musc.edu

Dr. Patrick J. Casey (post-doctoral mentor)
 Senior Vice Dean of Research, Duke-NUS Graduate Medical School Singapore, and James B. Duke Professor of Pharmacology and Cancer Biology
 Duke University Medical Center, Durham, NC
 919.613.8613
 casey006@mc.duke.edu

Dr. Alexander Tropsha (post-doctoral mentor and collaborator)
 Chair, Division of Medicinal Chemistry and Natural Products
 University of North Carolina School of Pharmacy, Chapel Hill, NC
 919.966.2955
 alex_tropsha@unc.edu

Dr. Stephen M. Lanier (graduate mentor)
Associate Provost for Research, and Professor, Cell and Molecular Pharmacology
Medical University of South Carolina, Charleston, SC
843.792.0442
laniersm@musc.edu

Dr. Thomas W. Gettys (dissertation committee member, mentor, and collaborator)
Professor and Chief, Experimental Obesity Division
Pennington Biomedical Research Center, Baton Rouge, LA
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