HYE-WON (JENNY) SHIN, Ph.D.

9 Ash Tree Lane, Irvine, CA 92612
(949) 294-9618, hyewons@uci.edu, hwshin.phd@gmail.com

PERSONAL STATEMENT

What sets me apart from many others in the field is the fact that I have a particularly unique background, specialized research skills and experience, and leadership engagement (professional and community service). I am a woman chemical engineer with biomedical, biotechnology, and clinical translational science experience. I hold a Ph.D. from the University of California, Irvine (Chemical and Biochemical Engineering and Materials Science), an M.S. from the Korea Advanced Institute of Science and Technology (KAIST, Chemical Engineering), South Korea, and a B.S. from Hongik University (Chemical Engineering), South Korea.

As a research scientist, significant periods of my life have been dedicated to research, teaching, and mentoring within the UCI School of Engineering, School of Medicine, and the Institute for Clinical and Translational Sciences. I have made pioneering contributions in the field of minimally-invasive medical technology known as “non-invasive disease detection using gas biomarkers” to detect and follow disease. I am currently seeking a new challenge by directing my career as a tenure-track faculty in the division of Biomedical Sciences at the University of California, Riverside to apply my skills and experience to contribute and grow in a professional way.

My overall goals and vision for the Biomedical Sciences program at the University of California, Riverside are to establish a *Biotransport and Translational Biotechnology Laboratory* to understand and improve human health and to develop a chemical engineering-based translational biomedical science curricula and laboratory courses that enhance existing strengths of the program by broadening student learning opportunities. I have three projects in emerging stages that I look forward to working on: (1) Biotransport in the Lung: mucus properties and environmental fine particles on respiratory infection, pulmonary drug delivery, and biomaterial development, (2) Gas Biomarkers: from cells to minimally invasive point-of-care molecular diagnostic device for global health and biodefense applications, and (3) Spatial and Temporal Dynamics of Free Nitric Oxide on Hematopoietic Stem and Progenitor Cell Lineage and Function in the Pulmonary Vasculature. I believe that my deep commitment to and personal passion for research, teaching, and engagement (service) will contribute to the University of California, Riverside Biomedical Engineering Program’s expanding portfolio of being a leader of both education and innovation.

CURRENT POSITION

Project Scientist/Principal Investigator
Department of Pediatrics, Pediatric Exercise Research Center (PERC)
Institute for Clinical and Translational Sciences (ICTS)
School of Medicine

I**nternational Program Facilitator and International Liaison**
Office of Global Engagement/Office of the Chancellor

University of California Irvine, Irvine, CA

EDUCATION AND TRAINING

Post-Doctoral Researcher, Biomedical Engineering, 2001-2006
University of California, Irvine

Ph.D., Chemical &Biochemical Engineering& Materials Science, 1998-2001
University of California, Irvine (UC GPA: 3.962/4.0)

Dissertation Topic: Nitric Oxide and GSNO Exchange Dynamics in Healthy and Diseased Human Airways
Advisor: Steven C. George. MD, PhD

M.S., Chemical Engineering, 1993-1995
The Korea Advanced Institute of Science and Technology (KAIST),South Korea

Dissertation Topic: Supercritical Fluid Extraction of Taxol and Baccatin III
Advisor: Huen Lee, PhD

B.S., Chemical Engineering (SUMMA CUM LAUDE and Valedictorian), 1989-1993
Hongik University, South Korea

RESEARCH INTERESTS

- Cardiopulmonary physiology/pathophysiologic 3D lung model
- Biotransport
- Breath sensors/biomarkers
- Immuno-cellular engineering
- Computational and mathematical modeling
- Systemic drug delivery by inhalation
- Biomaterials
- Hematopoietic stem cells in the pulmonary vasculature
- Multiscale systems integration
- Translational research

HONORS AND AWARDS

Honor Student Scholarship, 1989-1992
Hongik University, South Korea

The Korean Institute of Chemical Engineers (**KIChE) Honor Student Scholarship**, 1992-1993
The Korean Institute of Chemical Engineers (KIChE), South Korea

President Award, 1993
Hongik University, South Korea

KAIST Fellowship, 1993-1995
The Korea Advanced Institute of Science and Technology (KAIST), South Korea

UC Reagent Fellowship, 1999-2001

University of California, Irvine

GRANTS

Active

NIH Clinical and Translational Science Pilot Award –subproject of UL1 TR000153
Role: Principal Investigator
2014-2015
Title: Quantification of Hydrofluoroalkane Elimination Kinetics in the Exhaled Breath of Asthmatics
Funding Agency: National Center for Advancing Translational Sciences (NCATS) and the National Institute of Health (NIH)
Goal of the Study: the goal of the study is to measure hydrofluoroalkane (HFA) concentration in the exhaled breath following asthma inhaler administration in order to establish for the first time in asthmatic individuals a reliable asthma inhaler compliance monitoring methodology.
Direct Costs: $27,500

Aerocrine Research Grant
Role: Co-Principal Investigator
2014-2015
Title: The Adjunctive value of fractional exhaled nitric oxide (FENO) Monitoring in Managing Atopic Children with Persistent Asthma
Funding Agency: Aerocrine Inc. (http://www.aerocrine.com/en-us/)
Goal of the Study: the goal of the study is to examine whether exhaled nitric oxide measurement will result in better asthma management among underserved inner-city children.
Direct Costs: $80,600

2013 Translational Collaborative Discovery Grant
Role: Principal Investigator (multiple PI grant)
2013-2015
Title: Non-Invasive Diagnosis of Invasive Pulmonary Aspergillosis Using Exhaled Breath Gases
Funding Agency: UCI School of Medicine Dean's Strategic Planning Grant
Goal of the Study: the goal of this study is to identify unique volatile gases in the exhaled breath of Aspergillus-infected pediatric patients.This will then pave the way for using identified breath biomarkers as a novel, non-invasive diagnostic test for invasive pulmonary aspergillosis.
Direct Costs: $40,000

NIH Program Project Grant P01 HD048721
Role: Co-Investigator
2012—2016
Title: Mechanisms of Health Effects of Exercise in Children
Funding Agency: National Institute for Health (NIH)
Goal of the Study: the overall objective of the proposed research is to determine "whether 10-weeks of exercise training can benefit asthmatic children with a history of exercise-induced bronchoconstriction (EIB)" by examining the genomic, epigenetic, and inflammatory cellular regulation of circulating leukocyte.
$7.5 million

Pending

NHLBI and UC Center for Accelerated Innovation Technology Development Award
Role: Co-Principal Investigator
Title: A Novel Breath Biomarker Approach to Inhaled Medication Usage in Asthma
Funding Agency: University of California Center for Accelerated Innovation (UC CAI) and National Institute for Health (NIH) Heart, Lung and Blood Institute
Goal of the Study: the goal of the study is to develop a non-invasive breath sensor technology for licensing.
Direct Costs: $200,000

E.W. "Al" Thrasher Foundation Research Grant
Role: Principal Investigator (multiple PI grant)
Title: Fractional Exhaled Nitric Oxide (FENO) on Childhood Asthma Management in Primary Care Settings
Funding Agency: Thrasher Foundation
Goal of the Study: the goal of the study is s to evaluate the usefulness of FENO for managing asthma control in the primary care setting.
Direct Costs: $450,000

NIH R01
Role: Principal Investigator (multiple PI grant)
Title: Biotransport of Tetrafluoroethnae in the Asthmatic Lung: A Translational Study
Funding Agency: National Institute for Health (NIH)
Anticipated Submission: February 5, 2015

Completed

U54AI065359 09/22/09—08/31/11
Role: Co-Investigator
Title: Gas Biomarkers from Cultured Immune Cells in the Presence of Microorganisms
Funding Agency: Pacific Southwest Regional Center of Excellence (PSW RCE) and NIH for Biodefense & Emerging Infectious Diseases Research—Subproject
Goal of the Study: the purpose of this study is to investigate the volatile organic gases released from human immune cells in culture 1) in naïve and 2) in response to pathogenic bacteria invasion. We anticipate that granulocytes immune function is altered in the presence of pathogenic bacteria and may generate unique gas profiles, which could be used as novel, timely and specific gas biomarkers of their cellular function and metabolism
$1.1 million

ACADEMIC RESEARCH AND TEACHING POSITIONS

Undergraduate Researcher, 1989
Laboratory of Polymer and Organic Synthesis, Hongik University, South Korea

Graduate Research Assistant, 1999-2001
Chemical & Biochemical Engineering & Materials Science, University of California, Irvine

Teaching Assistant, 1999
"Heat and Mass Transfer"

Chemical & Biochemical Engineering & Materials Science, University of California, Irvine

Post-doctoral Research Fellow, 2001-2006
Department of Biomedical Engineering, University of California, Irvine

Project Scientist, 2006-present
Department of Pediatrics, University of California, Irvine

Interim Director, 2008-2009
Institute for Clinical and Translational Sciences (ICTS) Core Laboratory
University of California, Irvine, Irvine

International Liaison, Asia/Korea Representative, 2009-present
Office of Global Engagement, Office of the Chancellor
University of California, Irvine

INDUSTRIAL POSITIONS

Research Associate, 1994-1996
The division of Thesis Development, DOOSAN Training and Technology Center, South Korea

Senior Researcher, 1997-1999
The division of Product Technology, DOOSAN Training and Technology Center, South Korea

PATENTS

Korean Patent 158429, registered August 1998, "Supercritical extraction method of taxol and related compounds from needles of Taxus Cuspidata". M-K Chun, **H-W Shin**, J-H Yoon, and H Lee

US Patent Number 7,427,269, Issued September 23 2008, "Method to characterize exhaled nitric oxide from the airways using a sequence of breathhold maneuvers", **H-W Shin**, Condorelli, P., and SC George

US Patent Number 8,597,941, Issued December 3 2013, "Bioreactor for Quantification of Headspace Volatile Organic Gases (VOC) from Cultures", **H-W., Shin**, Umber, B. J., Blake, D.R., and Cooper, D.M.

US Patent Disclosure and Record of Invention, filed 2014(UCI Case No. 2014-673-1) "A Novel Approach to Asthma Inhaler Compliance Using Breath Measurement of Tetrafluoroethane", **H-W., Shin**, Blake, D.R., and Cooper, D.M.

BOOK CHAPTER

Dan M. Cooper, MD, Shlomit Radom-Aizik, PhD, **Hye-Won Shin, PhD**, Dan Nemet, MD. "Exercise and Lung Function in Child Health and Disease, " a chapter 13 of the Kendig & Chernick's Disorders of the Respiratory Track in Children (ISBM: 978-1-4377-1984-0), 8th Edition, Elsevier, 2012.

PEER-REVIEWED JOURNAL PUBLICATIONS

1. Chun, M-K, **H-W Shin** and Huen Lee, Supercritical Fluid Extraction of Taxol and Baccatin III from Needles of *Taxus Cuspidata*, *Biotech.Tech*., 8(8): 547-550, 1994.
2. Chun, M-K., **H-W Shin**., and Lee, H., Supercritical Fluid Extraction of Paclitaxel and Baccatin III from Needles of *Taxus Cuspidata*, *J. Supercritical Fluids*, 9: 192-198, 1996.
3. **Shin, H-W**, M-K Chun and Huen Lee, Extraction of Taxol and BaccatinIII from Needles of *Taxus Cuspidata* by Using Supercritical Carbon Dioxide with Cosolvents", *Korean J. Biotechnol. Bioeng*. 11(1): 100-106, 1996.
4. **Shin, H-W**. and S.C. George. Microscopic Modeling of Nitric Oxide and S-nitrosoglutathione Kinetics and Transport in Human Airways. *J. Appl. Physiol*. 90(3): 777-788, 2001.
5. Tsoukias, N.M., **H-W. Shin**, A.F. Wilson, and S.C. George. A Single Breath Technique with Variable Flow Rate to Characterize Nitric Oxide Exchange Dynamics in the Lungs. *J. Appl. Physiol*. 91(1): 477-487, 2001.
6. **Shin, H-W**., C. M. Rose-Gottron, F. Perez, D.M. Cooper, A.F. Wilson, and S.C. George. Flow-Independent Nitric Oxide Exchange Parameters in Healthy Adults. *J. Appl. Physiol*. 91(5): 2173-2181, 2001.
7. **Shin, H-W**., C. M. Rose-Gottron, R. S. Sufi, F. Perez, D.M. Cooper, A.F. Wilson, and S.C. George. Flow-Independent Nitric Oxide Exchange Parameters in Cystic Fibrosis. *Am.J. Resp. Crit. Care Med.* 165(3): 349-357, 2002.
8. **Shin, H-W**. and S.C. George. Impact of Axial Diffusion on Nitric Oxide Exchange in the Lungs. *J. Appl. Physiol.* 93(6): 2070-2080, 2002.
9. **Shin, H-W**., C. M. Rose-Gottron, D.M. Cooper, M. Hill, and S.C. George. Impact of High Intensity Exercise on Flow-Independent Nitric Oxide Exchange Parameters in Healthy Adults. *Medicine and Science in Sports and Exercise.* 35(6) 995-1003, 2003.
10. **Shin, H-W**., C. M. Rose-Gottron, D.M. Cooper, R.L.Newcomb, and S.C. George. Airway Diffusing Capacity of Nitric Oxide is not Impacted by Steroid Therapy in Asthma. *J. Appl. Physiol.* 96(1) 65-75, 2003.
11. Condorelli, P., **H-W. Shin**, and S.C. George. Characterizing Airway and Alveoli Nitric Oxide Exchange during Tidal Breathing Using a Three-Compartment Model. *J. Appl. Physiol.* 96(5) 1832-42, 2004.
12. **Shin, H-W**., P. Condorelli, C. M. Rose-Gottron, D.M. Cooper, and S.C. George. Probing the Impact of Axial Diffusion on Nitric Oxide Exchange Dynamics with Heliox. *J. Appl. Physiol.*, 97(3) 874-82, 2004.
13. **Shin, H-W**., P. Condorelli, and S.C. George. A New and More Accurate Technique to Characterize Airway Nitric Oxide Using Different Breathhold Times. *J. Appl. Physiol.,* 98(5) 1869-1877, 2005.
14. **Shin, H-W**., P. Condorelli, and S.C. George. Examining Axial Diffusion of Nitric Oxide in the Lungs Using Heliox and Breathhold. *J. Appl. Physiol.,* 100(2) 623-630, 2006.
15. **Shin, H-W.,** C. D. Schwindt, A.R. Aledia, C. M. Rose-Gottron, J. K. Larson, R. L. Newcomb, D.M. Cooper, and S.C. George. Exercise-Induced Bronchoconstriction Alters Airway Nitric Oxide Exchange In A Pattern Distinct From Spirometry. *AJP-Integrative*., 291(6), R1741-R1748, 2006.
16. Condorelli, P., **H-W. Shin**, A.R. Aledia, P.E. Silkoff, and S.C. George. A Simple Technique to Characterize Proximal and Peripheral Nitric Oxide Exchange Using Constant Flow Exhalations and An Axial Diffusion Model. *J. Appl. Physiol.,* 102(1) 417-425, 2007.
17. D. A. Shelley*, **H-W. Shin*,** and S. C. George. In Silico Modeling of Nitric Oxide Production, Transport, and Consumption in The Lungs. *Drug Discovery Today: Disease Models,* 4(3) 147-153, 2007.
    *contributed equally to this manuscript
18. **Shin, H-W.,** D. A. Shelley, A. Fitzpatrick, B. M. Gaston, and S.C. George. Airway Nitric Oxide

is Reduced Following Phosphate Buffered Saline Inhalation in Asthma. *J. Appl. Physiol.,* 102(3) 1028-1033, 2007.

19. Suresh, V., Shelley, D.S., **H-W. Shin,** and S. C. George. Effect of Heterogeneous Ventilation and Nitric Oxide Production on Exhaled Nitric Oxide Profiles*J. Appl. Physiol.,* 104(3) 1743-1752, 2008.
20. **Shin, H-W. *,** B. J. Umber*****, S. Meinardi, S-Y. Leu, F. Zaldivar, D. R. Blake***** and D. M. Cooper*****. Acetaldehyde and Hexanaldehyde from Cultured White Cells. *J. Trans. Med.,*7(31) 1-11, 2009.
    *contributed equally to this manuscript
21. C. D. Schwindt, F. Zaldivar, A. Eliakim, **H-W Shin**, S-Y Leu, D. M. Cooper. Inhaled Fluticasone and the Hormonal and Inflammatory Response to Brief Exercise. *Medicine & Science in Sports and Exercise*, 42 (10): 1802-1808, 2010.

Corresponding Author:

22. **Shin, H-W.,** B. J. Umber, S. Meinardi, S-Y. Leu, F. Zaldivar, D. R. Blake***** and D. M. Cooper*****. Gas Signatures from Cultured Neutrophils and Peripheral Blood Mononuclear Cells Obtained from Healthy Humans. *Journal of Molecular Biomarkers and Diagnosis,* 2:112, 2011
23. Umber,B. J., **Shin, H-W.,** S. Meinardi, S-Y. Leu, F. Zaldivar, D. M. Cooper and D. R. Blake. Gas Signatures from Escherichia coli and E.coli-Inoculated Human Whole Blood. *Journal of Clinical and Translational Medicine,* 2:13, 2013.

(Manuscripts in Final Preparation)

24. **Shin, H-W**., D.A. Shelley, S. P. Arold, B. Gaston, and S. C. George. Impact of pH on Gas Phase Nitric Oxide Release in Normal Human Bronchial Epithelial Cells.
25. **Shin, H-W.,** B. J. Umber, S. Meinardi, S-Y. Leu, F. Zaldivar, M. Lily, D. R. Blake and D. M. Cooper. Gas Signatures from Cultured Leukemia Cells.
26. **Shin, H-W.,** F. Zaldivar, S-Y. Leu, S. Aizik, S. Graf, and D. M. Cooper. Simultaneous Measurement of NO in Circulating Leukocytes (Intracellular) and Exhaled Breath from Healthy Controls following Exercise Challenge.
27. **Shin, H-W.,** F. Zaldivar, S-Y. Leu, S. Aizik, S. Graf, and D. M. Cooper. Predicting Asthma and Exercise-Induced Airway Alterations Based on Baseline Exhaled Nitric Oxide Levels.
28. **Shin, H-W.,** S. Maharaj, F. Zaldivar, M. Digman, S. Aizik, F. Haddad, S-Y. Leu, I. Randhawa, E. Nussbaum, E. Gratton, and D. M. Cooper. Intracellular Nitric Oxide Production and Cellular Localization in Human Leukocytes.
29. **Shin, H-W.,** B. Barletta, L. Yoonessi, S. Meinardi, S. Aizik, I. Randhawa, E. Nussbaum, D. M. Cooper, and D.R. Blake. Pharmacokinetic Analysis of Breath Hydrofluoroalkane from Healthy Controls Following Inhaled Corticosteroids Administration.
30. Merchant, C., S. Meinardi, B. Barletta, S. Aizik, S. Leu, F. Bany-Mohammed, D. M. Cooper, D.R. Blake, and **H-W. Shin**. Analysis of Exhaled Volatile Organic Compounds in Intubated Preterm Infants.

CONFERENCE PRESENTATIONS/PROCEEDINGS

1. Jeong, J-C, J-H Yoon, **H-W Shin** and Huen Lee, Metal affinity precipitation of phosphoproteins. BPERC International symposium'93, Taejon, Korea, September 10, 1993 (poster).
2. Jeong, J-C, J-H Yoon, **H-W Shin** and Huen Lee, Separation of phosphoproteins using metal affinity precipitation. Fall symposium by The Korean Institute of chemical engineers, Chungju, Korea, October 22-23, 1993 (poster).

3. Chun, M-K, **H-W Shin** and Huen Lee, Extraction of taxol-like compounds from needle and seed of yew tree by using supercritical carbon dioxide. Spring symposium by The Korean Institute of chemical engineers, Seoul, Korea, April 28-29, 1994 (poster).
4. Chun, M-K, **H-W Shin** and Huen Lee, Extraction of taxol-like compounds from needle and seed of yew tree: supercritical fluid extraction and solvent extraction. BPERC International symposium'94, Taejon, Korea, September 9, 1994 (poster).
5. **Shin, H-W**, M-K Chun and Huen Lee, Extraction and Bioseparation of taxol-like compounds from needles and seeds of yew tree: supercritical fluid extraction and solvent extraction. Fall symposium by The Korean Institute of chemical engineers, Chunju, Korea, October 28-29, 1994 (poster).
6. **Shin, H-W**, M-K Chun and Huen Lee, Extraction of taxol and like compounds from yew tree: Extraction using by soxhlet extractor and supercritical carbon dioxide. The 7th symposium on chemical engineering, Kyushu-Taejon/Chungnam, Kitakyshu, Japan, December 15-16, 1994 (poster).
7. **Shin, H-W**.,and S.C. George. Microscopic modeling of nitric oxide, glutathione and S-nitrosoglutathione kinetics and transport in human airways. 2000 Experimental Biology (EB), San Diego, CA, April, 2000 (poster).
8. **Shin, H-W**, N. M. Tsoukias and S.C. George. Estimating Flow-Independent Parameters Characteristic of NO Exchange in the lungs. 2000 Biomedical Engineering Society (BMES) annual fall meeting, Seattle, WA, October, 2000 (talk).
9. **Shin, H-W.,** C. M. Rose-Gottron, F. Perez, D.M. Cooper, A.F. Wilson, and S.C. George. Flow-Independent Nitric Oxide Exchange Parameters in Healthy Adults. 2001 American Thoracic Society (ATS) International Conference, San Francisco, CA, May, 2001 (poster).
10. **Shin, H-W.,** C. M. Rose-Gottron, R. S. Sufi, F. Perez, D.M. Cooper, A.F. Wilson, and S.C. George. Flow-Independent Nitric Oxide Exchange Parameters in Healthy Children and Cystic Fibrosis. 2001 American Thoracic Society (ATS) International Conference, San Francisco, CA, May, 2001 (poster).
11. **Shin, H-W.,** C. M. Rose-Gottron, D.M. Cooper, A.F. Wilson, and S.C. George. Flow-Independent Nitric Oxide Exchange Parameters in Airway Response to Exercise. 2001 Biomedical Engineering Society (BMES) annual fall meeting, Durham, NC, October, 2001 (poster).
12. Condorelli, P., **H-W. Shin**, and S.C. George. Characterizing Nitric Oxide Exchange Dynamics During Tidal Breathing. 2002 American Thoracic Society (ATS) International Conference, Atlanta, Georgia, May, 2002 (poster).
13. **Shin, H-W.,** C. M. Rose-Gottron, D.M. Cooper, A.F. Wilson, and S.C. George. Flow-Independent Nitric Oxide Exchange Parameters in Airway Response to Exercise: Role of Nitric Oxide and Cytokines. 2002 American Thoracic Society (ATS) International Conference, Atlanta, Georgia, May, 2002 (poster).
14. **Shin, H-W**., C. M. Rose-Gottron, D.M. Cooper, A.F. Wilson, A.F. Gelb, and S.C. George. Flow-Independent Nitric Oxide Exchange Parameters in Healthy and Asthmatic Subjects. 2002 American Thoracic Society (ATS) International Conference, Atlanta, Georgia, May, 2002 (poster).
15. **Shin, H-W**. and S.C. George. Non-Enzymatic Degradation of GSNO to Release Nitric Oxide: Role of pH, Glutathione, and Superoxide. American 2002 Thoracic Society (ATS) International Conference, Atlanta, Georgia, May, 2002 (poster).
16. **Shin, H-W.,** C. M. Rose-Gottron, D.M. Cooper, R.L. Newcomb, and S.C. George. Impact of Exercise-Induced Bronchoconstriction on Flow-Independent Nitric Oxide Exchange Parameters. 2003 American Thoracic Society (ATS) International Conference, Seattle, Washington, May, 2003 (poster).
17. **Shin, H-W.**and S.C. George. Impact of Axial Diffusion on Nitric Oxide Exchange in the Lungs. 2003 American Thoracic Society (ATS) International Conference, Seattle,

Washington, May, 2003 (poster).

18. Condorelli, P., **H-W. Shin**, and S.C. George. Characterizing Nitric Oxide Exchange Dynamics During Tidal Breathing. 2003 Biomedical Engineering Society (BMES) annual fall meeting, Nashville, Tennessee, October, 2003 (talk).
19. **Shin, H-W**., C. M. Rose-Gottron, P. Condorelli, D.M. Cooper, and S.C. George. Nitric Oxide Exchange Dynamics on Heliox Breathing. 2003 Biomedical Engineering Society (BMES) annual fall meeting, Nashville, Tennessee, October, 2003 (invited talk).
20. Condorelli, P., **H-W. Shin**, and S.C. George. Partitioning airway and alveoli exhaled nitric oxide during tidal breathing. 2004 American Thoracic Society (ATS) International Conference, Orlando, Florida, May, 2004 (poster).
21. **Shin, H-W.**and S.C. George. A New Technique to Characterize Nitric Oxide Exchange Dynamics using Different Breathold Times. 2004 American Thoracic Society (ATS) International Conference, Orlando, Florida, May, 2004 (poster).
22. **Shin, H-W.,** M. Barker, C. M. Rose-Gottron, D.M. Cooper, R.L. Newcomb,and S.C. George. Nitric Oxide Exchange Following Exercise in Cystic Fibrosis. 2004 American Thoracic Society (ATS) International Conference, Orlando, Florida, May, 2004 (poster).
23. **Shin, H-W.,**P. Condorelli, C. M. Rose-Gottron, D.M. Cooper, and S.C. George. Probing the Impact of Axial Diffusion on Nitric Oxide Exchange Dynamics with Heliox. 2004 American Thoracic Society (ATS) International Conference, Orlando, Florida, May, 2004 (poster).
24. **Shin, H-W**., P. Condorelli, and S.C. George. Impact of Axial Diffusion on Pulmonary Nitric Oxide Exchange. 2004 UC System-Wide Bioengineering Symposium2004, Irvine, CA, June, 2004 (poster).
25. **Shin, H-W**., P. Condorelli, and S.C. George. Impact of Axial Diffusion on Nitric Oxide Exchange with Different Breathold Times. 2004 Biomedical Engineering Society (BMES) annual fall meeting, Philadelphia, PA, October, 2004 (poster).
26. **Shin, H-W**., P. Condorelli, and S.C. George. Impact of Axial Diffusion on Nitric Oxide Exchange Using Heliox and Different Breathhold Times. 2005 American Thoracic Society (ATS) International Conference, San Diego, California, May, 2005 (poster).
27. Shelley, D.A., **H-W. Shin**, and S.C. George. Modeling the impact of lung pH on exhaled nitric oxide. 2006 American Thoracic Society (ATS) International Conference, San Diego, California, May, 2006 (poster).
28. Condorelli, P., **H-W. Shin**, A.R. Aledia, P.E. Silkoff, and S.C. George. A Simple Technique to Characterize Proximal and Peripheral Nitric Oxide Exchange Using Constant Flow Exhalations and An Axial Diffusion Model. 2006 American Thoracic Society (ATS) International Conference, San Diego, California, May, 2006 (poster).
29. **Shin, H-W.,** C. D. Schwindt, A.R. Aledia, C. M. Rose-Gottron, J. K. Larson, R. L. Newcomb, D.M. Cooper, and S.C. George. Exercise-Induced Bronchoconstriction Alters Airway Nitric Oxide Exchange In A Pattern Distinct From Spirometry. 2006 American Thoracic Society (ATS) International Conference, San Diego, California, May, 2006 (poster).
30. **Shin, H-W.,** N. Malavia, E. M. Henderson, B. M. Gaston, S. C. George. IL-13 Enhances GSNO Reductase Activity and Decreases Intracellular S-nitrosothiols in Lung Epithelial Cells. 2006 European Respiratory Society (ERS) International Conference, Munich, Germany, September, 2006 (E-poster)
31. Olin, A-C.,B. Bake, **H-W. Shin,** and S. C. George. Modeling of Alveolar Nitric Oxide and Its Relation To Respiratory Symptoms In Adult Population Study. 2007 American Thoracic Society (ATS) International Conference, San Francisco, California, May, 2007 (Poster Discussion).
32. Malavia, N., **H-W. Shin**, E. M. Henderson, B. Gaston, R.A Panettieri, Jr,and S. C. George. IL-13 Enhances GSNO Reductase Activity In Human Airway Smooth Muscle Cells. 2007 American Thoracic Society (ATS) International Conference, San Francisco, California, May, 2007 (poster).

33. Shelley, D.S., **H-W. Shin,** and S. C. George. Cytokine Treatment Alters pH of Mucus Secreted from Normal Human Bronchial Epithelial Cells. 2007 American Thoracic Society (ATS) International Conference, San Francisco, California, May, 2007 (poster).
34. **Shin, H-W.,** D. A. Shelley, A. Fitzpatrick, B. M. Gaston, and S.C. George. Airway Nitric Oxide is Reduced Following Phosphate Buffered Saline Inhalation in Asthma. 2007 American Thoracic Society (ATS) International Conference, San Francisco, California, May, 2007 (poster).
35. **Shin, H-W.,** D. A. Shelley, E. M. Henderson, N. Malavia, B. M. Gaston, S. C. George. GSNO Reductase and Glutaminase may Regulate pH in Differentiated Normal Human Airway Epithelial Cells. 2007 American Thoracic Society (ATS) International Conference, San Francisco, California, May, 2007 (poster).
36. Shelley, D.S., **H-W. Shin,** N. Malavia, and S. C. George. Cytokine Treatment Alters Glutaminase Kinetics In Normal Human Bronchial Epithelial Cells. 2007 Biomedical Engineering Society (BMES) annual fall meeting, Los Angeles, CA, October, 2007 (poster).
37. Shelley, D.S., V. Suresh, J.L. Puckett, **H-W. Shin,** and S. C. George. Modeling Heterogeneous Nitric Oxide Exchange in The Asthmatic Lung Using Multi-Compartment Model. 2008American Thoracic Society (ATS) International Conference, Toronto, Canada, May, 2008 (Invited Talk).
38. Puckett, J.L., A. Aledia, **H-W. Shin**, D. Shelley, S.P. Galant, and S.C. George.Airway and Alveolar Nitric Oxide Phenotypes in the Pediatric Asthma Population. 2008 American Thoracic Society (ATS) International Conference, Toronto, Canada, May, 2008 (poster).
39. Puckett, J.L., A. Aledia, D. Shelley, **H-W. Shin**, S.P. Galant, and S.C. George. Phenotyping Symptomatic Asthma Using Proximal and Peripheral Exhaled Nitric Oxide. European Respiratory Society (ERS) International Conference, Berlin, Germany, October, 2008 (poster)
40. **Shin, H-W.,** B. J. Umber, S. Meinardi, S-Y. Leu, F. Zaldivar, D. R. Blake and D. M. Cooper. Acetaldehyde and Hexanaldehyde from Cultured White Cells. 2009 Experimental Biology (EB), New Orleans, LA, April, 2009 (poster).
41. **Shin, H-W.,** B. J. Umber, S. Meinardi, S-Y. Leu, F. Zaldivar, D. R. Blake and D. M. Cooper. Gas Signatures from Cultured Human Leukocytes. 2010 American Thoracic Society (ATS) International Conference, New Orleans, LA, May, 2010 (poster).
42. **Shin, H-W.,** F. Zaldivar, S-Y. Leu, S. Aizik, S. Graf, and D. M. Cooper. Simultaneous Measurement of NO in Circulating Leukocytes (Intracellular) and Exhaled Breath Following Exercise Challenge. 2011 American Thoracic Society (ATS) International Conference, Denver, CO, May, 2011 (oral presentation).
43. **Shin, H-W.,** F. Zaldivar, S-Y. Leu, S. Aizik, S. Graf, and D. M. Cooper. Predicting Asthma and Exercise-Induced Airway Alterations Based on Baseline Exhaled Nitric Oxide Levels. 2012 American Thoracic Society (ATS) International Conference, San Francisco, CA, May, 2012 (poster presentation).
44. **Shin, H-W.,**S. Maharaj, F. Zaldivar, M. Digman, S. Aizik, F. Haddad, S-Y. Leu, I. Randhawa, E. Nussbaum, E. Gratton, and D. M. Cooper. Intracellular Nitric Oxide Production and Cellular Localization in Human Leukocytes. 2013 American Thoracic Society (ATS) International Conference, Philadelphia, PA, May 17-22, 2013 (poster presentation).
45. **Shin, H-W.,**B. Umber, S. Meinardi, F. Zaldivar, S-Y. Leu, D. M. Cooper, and D.R. Blake. Gas Signatures from *E. coli* and *E.coli*-Inoculated Whole Blood. 2013 American Thoracic Society (ATS) International Conference, Philadelphia, PA, May 17-22, 2013 (poster presentation).
46. **Shin, H-W.,** B. Barletta, L. Yoonessi, S. Meinardi, S. Aizik, I. Randhawa, E. Nussbaum, D. M. Cooper, and D.R. Blake. A Novel Approach to Asthma Inhaler Compliance Using Breath Measurement of Aerosol. 2014 American Thoracic Society (ATS) International Conference, San Diego, CA, May 16-21, 2014 (poster presentation).

47. Merchant, C., S. Meinardi, B. Barletta, S. Aizik, S. Leu, F. Bany-Mohammed, D. M. Cooper, D.R. Blake, and **H-W. Shin**.Analysis of Exhaled Volatile Organic Compounds in Intubated Preterm Infants. 2014 American Thoracic Society (ATS) International Conference, San Diego, CA, May 16-21, 2014 (poster presentation).

INVITED SEMINARS AND PRESENTATIONS

1. Department of Chemical and Biochemical Engineering, University of California, Irvine, CA, Fall Seminar, 1999
2. 2nd Annual U.C. Irvine Multidisciplinary Exercise Science Group Retreat, Newport Beach, California, May 2003
3. Department of Biomedical Engineering, University of California, Irvine, CA, Spring Seminar, 2006
4. School of Medicine, Seoul National University Hospital, 2006
5. Breath Analysis Workshop, UC-Davis, California, September 8-9, 2008
6. 2010 National Regional Center of Excellence (RCE) Meeting, Las Vegas, Nevada, April 11-13, 2010
7. 2011 National Regional Center of Excellence (RCE) Meeting, Denver, Colorado, April 3-5,2011
8. The National Institute of Health conference “Cancer Detection and Diagnostics Technologies for Global Health”, Bethesda, Maryland, August 22-23, 2011

PROFESSIONAL SERVICES AND ACTIVITIES

Editorial Board Member:

- Editorial Board of Scientifica
- Editorial Board of Edorium Journal of Biomedical Science

Peer-Review Journal Referee:

- American Journal of Respiratory and Critical Care Medicine
- Journal of Biological Physics
- Journal of Applied Physiology
- Sensors Journal-IEEE
- European Respiratory Journal
- Journal of Breath Research
- Journal of Biomedical Science and Engineering
- International Journal of Sports Medicine

Extramural Grant Reviews:
National Institutes of Health (NIH), 2009-present

Institutional Grant Reviews:
Pilot Project Award Grant proposals, 2011-present
Institute for Clinical and Translational Sciences
University of California, Irvine

Dean’s Triumvirate Award Grant proposals, 2012-present

School of Medicine
Institute for Clinical and Translational Sciences
University of California, Irvine

University of Rochester Pilot Project Award Proposals, 2013
Institute for Clinical and Translational Sciences
University of California, Irvine

Panelist:
Invited Panelist for *NATURE* (www.nature.com) Reader Panel, 2010
Invited to *NEWNATURE Publishing Group Product*-Trial Invitation, 2011

University Services:
President,Students' Association, 1994-1995
Department of Chemical Engineering
The Korea Advanced Institute of Science and Technology (KAIST), South Korea

Chair, Institute for Clinical and Translational Sciences (ICTS) Core Laboratory Oversight Committee, 2009
University of California, Irvine

Judge, CAMP (the UC Louis Stokes Alliance for Minority Participation) Statewide Undergraduate Research Symposium (http://www.camp.uci.edu/), 2010-2011
University of California, Irvine

Research Strategic Planning Committee, 2010
Department of Pediatrics, University of California, Irvine

Research Grant Proposal Review Committee, 2011-present
Institute for Clinical and Translational Sciences (ICTS)
University of California, Irvine

Fellow's Scholarship Oversight Committee, 2013-present
Neonatal-Perinatal Medicine
Department of Pediatrics
University of California, Irvine

UCI Korea Alumni Club Leader, 2014-present
http://www.alumni.uci.edu/chapters/index.php
UCI Alumni Association, University of California, Irvine

K-12 EDUCATIONAL OUTREACH

Co-Program Developer, Summer 2010 Inaugural International K-12 Program
July 25-August 7, 2010
Gyeonggi Science High School, South Korea
The Center for Educational Partnership at University of California, Irvine

Organizer/Coordinator, COSMOS-UCI Biomedical Science Cluster"CLINICAL

TRANSLATIONAL SCIENCE: THE NEXT GENERATION OF BIOMEDICAL RESEARCH", 2010, 2011, 2012, 2013, 2014
University of California, Irvine

*COSMOS: UC System-wide Summer Program for High School Students (www.cosmos.uci.edu)

PROFESSIONAL AFFILIATIONS

The American Institute of Chemical Engineers (AIChE)
The American Physiological Society
The American Thoracic Society
Korean-American Scientists and Engineers Association

SKILLS AND LABORATORY EXPERIENCES

Computational Experiences:
Programs and Software: Labview, Matlab, MS-office, Sigma plot, Polymath, FEMLAB, JMP, RedCap
Programming language: Fortran

Laboratory Experiences:
Analytical Instrument: Nitric Oxide Analyzer (gas and liquid), Pneumotachometer, Gas Chromatography, High-Performance Liquid Chromatography

Separation Instrument: Extractor (conventional and supercritical extractor), Chromatography (batch to semi-plant scale including Thin layer chromatography, Metal affinity chromatography).

Cell/Tissue Culture: A549 (Human lung cell line), NHBE (Normal human bronchial epithelial cell), NHLF (Human lung fibroblast), HASM (Human airway smooth muscle cell), HL60 (human myeloid leukemia cell line), Jurkat (human leukemic T cell line) cell culture, Primary and transformed human leukocyte culture

Microbiological Culture: Escherichia coli, Burkholderia thailandensis

*Mathematical Modeling:*Multi-compartment modeling, Non-linear regression analysis, Enzyme Kinetics

Biological Analysis: Western Blotting, RT-PCR, Protein quantification, Reduced and oxidized glutathione assay, Nitrite/nitrate assay, Ammonia assay, Fluorescence imaging and analysis, gas phase nitric oxide and other volatile organic compounds characterization, Flow cytometry

Industrial Experience (Doosan Technology Center): Separation and purification process set-up and scale-up for bulk and fine lipids

LANGUAGES

English
Korean

REFERENCES

Steven C. George, M.D., Ph.D.
Elvera and William Stuckenburg Professor and Chair
Department of Biomedical Engineering
Washington University in St. Louis
1 Brookings Drive
Campus Box 1097
St. Louis, MO 63130, USA
Email: scg@wustl.edu
Voice: (314) 935-4588
Lab web: http://georgelab.bme.wustl.edu

Benjamin Gaston, M.D.
Professor of Pediatrics
Chief, Division of Pediatric Pulmonology, Allergy and Immunology
Case Western Reserve University
Rainbow Babies and Children's Hospital
2109 Adelbert Rd Cleveland, OH 44106
Email: bmg46@case.edu, benjamin.gaston@case.edu
Voice: (216) 368-0826

Michelle Digman, Ph.D.
Assistant Professor of Biomedical Engineering
University of California, Irvine Laboratory for Fluorescence Dynamics
3204 Natural Sciences II
Email: mdigman@uci.edu
Office:(949) 824-3255
Mobile: (949)282-8220
http://www.lfd.uci.edu/
https://sites.google.com/site/usibrprogram2013/