

# ***Curriculum Vitae for Said H. Audi, Ph.D.***

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<https://mcw.marquette.edu/biomedical-engineering/computational-lung-physiology-lab/index.php>

## **Education:**

<b>Institution and Location</b>	<b>Dates Attended</b>	<b>Degree</b>	<b>Conferred</b>	<b>Field of Study</b>
University of Georgia Athens, GA	1985-1986			Pre-engineering
Marquette University Milwaukee, WI	1986-1988	B.S.	December, 1988	Biomedical Engineering
Marquette University Milwaukee, WI	1989-1990	M.S.	December, 1990	Biomedical Engineering
Marquette University Milwaukee, WI	1991-1993	Ph.D.	December, 1993	Biomedical Engineering

## **Positions held:**

1988-1990	Research Assistant, Marquette University, Milwaukee, WI
1991-1993	Arthur Schmitt Predoctoral Fellow, Marquette University, Milwaukee, WI
1994-1996	Postdoctoral Fellow, American Heart Association (Marquette University), Milwaukee, WI
1997-2002	Research Assistant Professor, Biomedical Engineering, Marquette University
1997-present	Adjunct Assistant Professor of Medicine (Pulmonary and Critical Care), Medical College of Wisconsin, Milwaukee, WI
2002-2008	Assistant Professor of Biomedical Engineering, Marquette University, Milwaukee, WI
2008-2016	Associate Professor of Biomedical Engineering, Marquette University, Milwaukee, WI
2013-present	Associate Professor of Pulmonary/Critical Care section, Research Service, Zablocki VA Medical Center, Milwaukee, WI
2014-present	Adjunct Associate Professor of Biotechnology and Bioengineering, Medical College of Wisconsin, Milwaukee, WI
2016-present	Professor of Biomedical Engineering, Marquette University, Milwaukee, WI
2019-present	Director of Graduate Studies for the BME department, Marquette University, Milwaukee, WI

## **Awards and Honors:**

1988	<i>Summa Cum Laude</i> (Marquette University)
1988	Top Scholastic Award in Biomedical Engineering (Marquette University)
1990-1992	Arthur Schmitt Predoctoral Fellow
1994-1996	American Heart Association of Wisconsin Postdoctoral Fellowship
2016	2016 Outstanding Engineering Teacher Award, OPUS College of Engineering, Marquette University, Milwaukee, WI
2017	Medical College of Wisconsin Graduate School of Biomedical Sciences Dean's Choice for Outstanding Graduate School Educator.
2019	Outstanding Engineering Researcher, OPUS College of Engineering, Marquette University, Milwaukee, WI
2020	Medical College of Wisconsin Graduate School of Biomedical Sciences Dean's Choice for Outstanding Graduate School Educator.

## **Professional Affiliations:**

1993-present	Member, Biomedical Engineering Society
1996-present	Member, American Physiological Society

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1993-present Member, American Heart Association Council on Cardiopulmonary and Critical Care  
 1992-present Sigma Xi, the Scientific Research Society  
 2007-present Order of the Engineer

### **Professional Activities:**

February 25-26, 2021 NHLBI Respiratory Integrative Biology and Translational Research (RIBT) Study Section  
 August 17, 2020 Advancing Healthier Wisconsin RFA on Medical Devices and Cellular Engineering  
 July 10-15, 2020 DoD Peer Reviewed Medical Research Program Discovery- Respiratory Health- peer review panel (DIS-RH-2), ad hoc reviewer  
 October 31, 2019 NHLBI study section (ZRG1 F18-Z (20)), study section member  
 July 9-10, 2018 NHLBI study section (ZRG1 PSEA 55), study section member  
 June 12-13, 2017 NHLBI study section (PSE V 56), study section member  
 Dec 2016- Aug 2017 Inquiry and Investigative Committee member, Blood Research Institute  
 2014-present BMES abstract reviewer  
 October, 2016 Co-chaired a session (Experimental Respiratory Mechanobiology) at the fall meeting of the Biomedical Engineering Society, Minneapolis, MN.  
 April, 2016 Organized the annual Sigma Xi poster symposium  
 2015-2016 Clinical & Translational Science Institute (CTSI) Pilot Award Coach  
 April, 2015 Organized the annual Sigma Xi poster symposium  
 2014-present Treasurer, Marquette Chapter of Sigma Xi, the Scientific Research Society  
 2011-2014 Clinical and Translational Science Institute (CTSI) Core Committee  
 2009-2010 President, Marquette Chapter of Sigma Xi, the Scientific Research Society  
 October, 2009 Organized/co-chaired a lung session (Asthma, Fibrosis and COPD) at the fall meeting of the Biomedical Engineering Society, Pittsburgh, PA  
 July, 2009 NHLBI study section, ad hoc reviewer  
 October, 2008 Organized/co-chaired a lung session at the fall meeting of the Biomedical Engineering Society, St. Louis  
 March, 2008 Organized the annual Sigma Xi poster symposium  
 September, 2007 Organized/co-chaired a lung session at the fall meeting of the Biomedical Engineering Society, Los Angeles.  
 2007-2009 Vice President, Marquette Chapter of Sigma Xi, the Scientific Research Society  
 November, 2006 Moderator, *Ventilation and Perfusion Session*  
 Mathematical Biosciences Institute Workshop (NSF), Ohio State University  
 May, 2006 Member of the organizing committee of the Cardiovascular Health symposium sponsored by the Biomedical Technology Alliance (BTA) of Southeastern Wisconsin  
 2006-2007 Member-at-Large, Marquette Chapter of Sigma Xi, the Scientific Research Society  
 October, 2003 Session chair (Pulmonary circulation & gas exchange), annual fall meeting of the Biomedical Engineering Society  
 2001-2002 President, Marquette Chapter of Sigma Xi, the Scientific Research Society  
 2001-2002 Organized the annual Sigma Xi mini-symposium  
 2001-2002 Organized the annual Sigma Xi banquet  
 2000-2001 Vice President, Marquette Chapter of Sigma Xi, the Scientific Research Society  
 2000-2001 Organized the annual Sigma Xi poster symposium  
 1999-2000 Review Panel, National Defense Science and Engineering Graduate Fellowships

### **Editorial board:**

Frontiers in Physiology, 2021-present  
 Journal of Computational Medicine, 2013-present  
 World Journal of Biological Chemistry, 2014-present  
 Cardiovascular Pathology: Open Access, October 2015-present

### **Guest Referee:**

Annals of Biomedical Engineering, 1997-present  
 Journal of Applied Physiology, 1998-present  
 American Journal of Physiology, 2000-present  
 Pediatric Pulmonology, 2011-present

Journal of Computational Medicine, 2013-present  
 European Journal of Applied Physiology, 2011-present  
 Biomedical Engineering Society meeting (abstracts' reviewer), 2011-present  
 Physiological Reports, 2017-present  
 Frontiers in Physiology, 2017 - present  
 The Journal of Visualized Experiments, 2018-present  
 PLOS One, 2018-present  
 Current Pharmaceutical Design, 2018-present  
 Antioxidants, 2018-present  
 Apoptosis, 2018-present  
 Respiratory Research 2019-present  
 International Journal of Molecular Sciences, 2019-present  
 Transplant International, 2019-present  
 Journal of Radioanalytical and Nuclear Chemistry, 2020-present

### **Community service:**

2017 Career fair at New Belin Middle/High schools  
 2012-2017 High Interest Day (Orchard Lane Elementary School, New Berlin, WI)  
 Developed and run a pig heart dissection module for 5<sup>th</sup> and 6<sup>th</sup> graders

### **Teaching:**

- BIEN 3200: “Computer Applications in Biomedical Engineering”
- BIEN 4400/5400: “Transport Phenomena for Biomedical Engineers”
- BIEN 4710/5710: “Analysis of Physiological Models”
- BIEN 6620: “Modeling Rehabilitative Biosystems”
- BIEN 6931: “Modeling and Simulations of Integrated Cellular Systems”
- BIEN 4720/5720: *Cardiopulmonary mechanics (airway mechanics module)*

### **Mentoring, Supervision, Advising:**

#### ***Medical fellows:***

**Ruchi Singla, MD, 2011-2014**

Scholarship Oversight Committee member (Children’s Hospital of Wisconsin)

Overseeing and assessing the progress of Dr. Singla’s scholarly activity in the area of pulmonary hypertension.

Andrew Spearman, MD, 2022-present

One of the mentors for Dr. Spearman’s NIH K08 award

#### ***Current graduate students:***

**Ms. Pardis Tehari, PhD student, 2019-present (Committee Chair)**

#### ***Current undergraduate students:***

**Mr. Neil Battacharya, May 2022-present**

#### ***Former graduate students:***

**Ms. Swetha Ganesh, MS student, 2019-2021 (Committee Chair)**

**Mr. Anthony Cammarata, MS student, Biomedical Engineering, 2019 (Committee Chair)**

His thesis research focused on the development of an optical fluorescence imaging approach to evaluate the effect of acute lung injury on mitochondrial membrane potential in isolated perfused rat lungs.

**Mr. Xiao Zhang, PhD, Biomedical Engineering, 2019 (Committee Chair)**

A major focus of his dissertation work was the development of a large-scale, thermodynamically-constrained computational model of lung tissue bioenergetics under physiologic and pathophysiologic conditions.

**Current position:** Postdoctoral fellow, Joint MU-MCW department of Biomedical Engineering

**Mr. Benjamin Rizzo** *PhD, Mathematics, Statistics and Computer Science, 2018 (co-mentor/committee member, Dr. Anne Clough: mentor/committee chair).*

**Current position:** Postdoctoral fellow, Joint MU-MCW department of Biomedical Engineering

**Ms. Katherine Barry.** *MS, Biomedical Engineering, 2018 (Committee Chair)*

Her thesis research focused on the use of physiologically based pharmacokinetic modeling (PBPK) to elucidate the mechanisms that determine the lung uptake and retention of two clinical SPECT biomarkers under physiologic and pathophysiologic conditions.

**Current position:** Product Manager, Vista Apex Dental Products

**Ms. Nina Friedly, MS.,** *Biomedical Engineering, 2018 (committee chair)*

Her thesis research focused on the use of optical fluorescence imaging to evaluate the rate of lung formation of reactive oxygen species.

**Current position:** Technical Solutions Engineer – Radiology, Epic Computer Software, WI

**Zhuohui Gan, PhD, 2011 (Committee Chair)**

**Dissertation title:** *Quantitative Evaluation of Redox Processes in the Intact Rat Lung and Cultured Pulmonary Arterial Endothelial Cells and the Effect of Hyperoxia*

**Current position:** Senior Researcher, Wenzhou Medical University, Wenzhou, China

**Joseph Capacete, MS, 2010 (committee chair)**

**Thesis title:** *Quantification of <sup>99m</sup>Tc-Duramycin Uptake Kinetics in Normal and Infarct Rat Myocardium Using Compartmental Analysis.*

**Current position:** Software Engineer at Virtual Radiologic, Minneapolis, MN

**Madhavi Ramakrishna, MS, 2009 (committee chair)**

**Thesis title:** “Capillary Perfusion Kinematics in Lungs of Oxygen-Tolerant Rats”

**Current position:** Software Requirements Engineer, St. Jude Medical Cardiac Rhythm Management Division, Sylmar CA.

**Taniya Ahuja, MS, 2006 (committee chair)**

**Thesis Title:** *Quantification of Pulmonary Perfusion Kinematics in Rats from Microfocal Angiographic Images*

**Current position:** Instructional Designer-Technical, GE Healthcare, Waukesha, WI

**Viola Fernandes, MS, 2004 (committee chair)**

**Thesis title:** *Development of Numerical and Statistical Tools for Quantitative Interpretation of Cellular Redox Mechanisms*

**Current position:** Product Manager, Siemens Healthcare, Philadelphia, PA

**Luke Rugani, MS, 2004 (committee chair)**

**Thesis title:** *Multiple Indicator Dilution Approach to Understanding Mechanisms of Lung Adaptation to Hyperoxia*

**Current position:** Associate, TigerRisk Partners, Raleigh-Durham, NC

**Jessica O’Connor, MS, 2003 (committee chair)**

**Thesis title:** *Reduction Of Trolox Quinone by Pulmonary Artery Endothelial Cells*

**Current position:** Program Manager, Covance Laboratories, Monona, WI

***Dissertation/thesis committee service (\*co-mentor):***

**Arash Ghorbannia, (MU-MCW, BME), PhD dissertation 2020-present**

**Hoon Choi, (MU-MCW, BME), PhD dissertation, 2020**

**Xiangqian Hong (MU-MCW, BME), PhD dissertation 2018-present**

**Shima Sadri, (MU-MCW, BME), PhD dissertation, 2017-present**

**Sofie Schunk (MU, BME), MS, 2015**

**Hongfeng Wang (MU, BME), PhD, 2013**

**Kevin Staniszewski (UW-Milwaukee, Electrical Engineering), MS, 2012\***

**Arjun Menon** (MU, BME), PhD, 2012  
**Loolu Rafecq** (MU, BME), MS, 2012 \*  
**Xiaoguang Zhu** (Medical College of Wisconsin, Biophysics), PhD, 2010  
**Andrew Williams** (MU, BME), MS, 2008  
**Jason Haines** (MU, BME), MS, 2008  
**Xiaolin Liu** (MU, BME), PhD, 2008  
**Yu Wang** (MU, BME), PhD, 2008  
**Aparna Nittala**, (MU, BME), MS, 2005  
**Deborah Jaye**, (MU, BME), MS, 2005  
**Angela Schultz**, (MU, BME) MS, 2005  
**Laura Danielson**, (MU, BME), MS, 2004  
**Christopher Quarles** (Medical College of Wisconsin, Radiology), PhD, 2004  
**Olga Imas** (MU/Medical College of Wisconsin, BME-Functional Imaging), PhD, 2004  
**John LaDisa** (MU, BME), PhD, 2004  
**Samhita Rhodes** (MU/Medical College of Wisconsin, BME-Functional Imaging), PhD, 2003  
**Amanda Potocky** (MU, BME), MS, 2002  
**Eric Rohr** (MU, BME), MS Thesis, 2000  
**Marie Schulte** (Medical College of Wisconsin, Physiology), PhD, 2000  
**Meha Petal** (MU, BME), MS, 1999

***Former undergraduate BME students:***

**Madison Sirney**, June 2019-August 2019  
**Jarret Burgess**, June 2019-August 2019  
**Marcus Weitikammer**, May 2019-November 2019  
     *Second place poster, 2019 CVC Research Retreat*  
     *Title: Evaluation of Airway Mechanics in a Rat Model of Acute Lung Injury*  
**Barbara Sammut**, March 2019-May 2019  
**Anthony Cammarata**, June 2015-August 2015  
**Nina Friedly**, June 2015-May 2016  
**Khader Zahdan**, June 2015-August 2016  
**Devin Wozniak**, March 2015-December 2015  
**John Sobolewski**, January 2014-December 2014  
**Hassan Qureshi**, August 2012-November 2013  
**Dean Zsenak**, May 2011-May 2012  
**Adam Theis**, Sept 2010- May 2012  
**Michael Poellmann**, May 2006-May 2007

***Senior design projects (role: Advisor):***

**Project title:** *Hearing Protection Device for Dentists* (fall 2021-spring 2022)  
**Project title:** *Software for Modeling Aneurysms* (fall 2019-spring 2020)  
**Project title:** *Real-Time Heart Rate Variability Feedback Device* (fall 2018 –spring 2019)  
**Project title:** *Hypothermia Blanket* (fall 2017-spring 2017)  
**Project title:** *RF Torso Model* (fall 2015-spring 2016)  
**Project title:** *Cardiac Patient Simulator* (fall 2013-spring 2016), 3-year project  
**Project title:** *Self Casting Fishing Rod* (fall 2012, spring 2013)  
**Project title:** *Acidosis/Alkalosis Detector* (fall 2011, spring 2012)  
**Project title:** *Wireless ECG* (fall 2010, spring 2011)  
**Project title:** *Assistive Technology to Dispense Medication for Patient without Hand Function* (fall 2009, spring 2010)  
**Project title:** *Passive-knee Rehabilitation Brace* (fall 2008, spring 2009)  
**Project title:** *Method for Diagnosis of Pulmonary Edema* (fall 2006, spring 2007)  
**Project title:** *A Counterpulsation System for Reducing Cardiac Workload* (fall 2005, spring 2006)  
**Project title:** *Respiratory Motion Trigger* (fall 2003, spring 2004)  
**Project title:** *Development of Valve for Urostomy Pouch* (fall 2002, spring 2003)

**University Service:*****Departmental:***

2019-2020 Interim Chair, P&T Committee  
 2019-present Director of Graduate Studies  
 2019-present Faculty search committee  
 2019 Faculty search committee  
 2016-2017 Developed (with Dr. Dash) the Student Handbook for the new MU-MCW PhD degree program in Biomedical Engineering  
 2015-2016 Chair search committee  
 2002-present Department Graduate committee  
 2002-present Department Laboratory committee  
 2003-present Academic advisor for 20-25 BME undergraduate students/year  
 2012-2014 Biomedical Engineering Chair search committee  
 2006-2007 Faculty search committee  
 2016-present Department P&T committee

***College:***

2010 College Task Force on Measuring Faculty Activity  
 2017-present College P&T committee (BME representative)

***University:***

2018-2019 University Board of Graduate Studies  
 2018-2019 Academic Integrity Council  
 2015-2017 Academic Integrity Council  
 2015-present Reviewer, Schmitt Fellowship  
 2015-2018 Faculty Council Committee  
 2013-present Vice-Chair, University Committee on Committees and Elections  
 2012-2015 University Committee on Faculty Welfare  
 2006-2009 University Core Curriculum Review committee

***Zablocki VA Medical Center:***

2016-Present Radiation Safety Committee

**Research Grants:*****Active:***

**Summer Faculty Fellowship/Regular Research Grant (MU)** \$20,920 1/21/2022 –6/30/2023  
**Title:** Evaluation of a Novel Therapeutic for Acute Respiratory Distress Syndrome (ARDS)  
**Role:** PI

**Opus College of Engineering (SURF program)** 05/01/2022-12/31/2022  
**Title:** *Redesigning a Rodent Imaging System*  
**Total budget:** Undergraduate Research Fellowship Program  
**Role:** PI and Mentor, Neil Bhattacharya (undergraduate student)

**NIH (NHLBI) R15** 01/15/2019– 9/30/2022  
**Title:** SPECT Imaging and Computational Modeling for Assessment of Acute Lung Injury  
**Total budget:** \$379,414  
**Role:** PI

**VA Merit Review (PI: Dr. Elizabeth Jacobs, Medical College of Wisconsin)** 04/01/2019 – 07/31/2023  
**Title:** Role of Mitochondrial Dysfunction in Hyperoxia-induced Pulmonary Vascular Endothelial Injury  
**Total budget:** \$641,936 (MU budget: \$210,058)  
**Role:** Co-1/site PI (25% effort) (PI: Dr. Elizabeth Jacobs, Medical College of Wisconsin)

**NIH/NIAID 1U01AI133594-01 (PI: Meetha Medhora, MCW)** 12/01/2017 – 11/30/2022  
**Title:** Mechanism of Radiation Induced Endovascular Injury and Mitigation via the Notch-DII4 Pathway  
**Total budget:** \$2,599,476 (MU budget: \$53,513)

**Role:** Co-I (8.3% effort for years 1-3)

**Pending:**

**NIH (NIGMS) STTR Phase I (PI: Vivid Microscopy, Madison, WI)** 6/1/2021 – 5/30/2022  
**Title:** *Dithio Probes to Monitor Lung Thiol Levels in Models of ARDS: Tools for Drug Screening and Diagnosis*  
**Budget:** \$252,131 (MU Subcontract, \$48,741)  
**Role:** Co-investigator/MU PI

**Department of Defense (PI: Clements A)** 11/01/2020 -10/31/2022  
**Title:** *Sustained delivery of anakinra to treat & prevent acute respiratory distress syndrome*  
**Objective:** To improve the efficacy of anakinra to treat and prevent ARDS and decrease the amount of anakinra required for successful treatment, and to produce IND-enabling preclinical data and further develop and scaleup the manufacture of anakinra and MCMs in preparation of clinical trial initiation.  
**Role:** Co-investigator/MU PI

**Completed:**

**Opus College of Engineering** 05/01/2019-12/31/2019  
**Title:** *Evaluation of Airway Mechanics in a Rat Model of Acute Lung Injury*  
**Total budget:** Undergraduate Research Fellowship Program, \$5,000  
**Role:** PI and Mentor, Marcus, Weitekamper (undergraduate student)

**Summer Faculty Fellowship/Regular Research Grant (MU)** 1/21/2018 – 12/31/2018  
**Title:** Molecular imaging in lung transplantation  
**Role:** PI  
 Overall goal is to evaluate and test novel means of detecting and reversing lung transplant-induced injury.

**NIH (NHLBI) R15 HL129209** 7/1/2015 – 10/31/2018  
**Title:** SPECT Imaging and Computational Modeling for Assessment of Acute Lung Injury  
**Total budget:** \$378,555  
**Role:** PI

**NIH (NHLBI) R01 HL116530** 08/01/2013– 04/31/2018  
**Title:** Novel imaging to identify lung mitochondrial injury and predict recovery  
**Total budget:** \$1,074,263 (MU budget: \$258,749)  
**Role:** Co-I/site PI (17% effort) (PI: Dr. Elizabeth Jacobs, Zablocki VAMC/Medical College of Wisconsin)

**VA Merit Review Award BX001681** 04/01/2013 to 3/31/2018  
**Title:** Novel Diagnostics to Detect Lung Injury  
**Total budget:** \$641,936 (MU budget: \$50,000)  
**Role:** Co-I/site PI (5% effort) (PI: Dr. Elizabeth Jacobs, Medical College of Wisconsin)

**Birnschein Foundation, Milwaukee, WI** 1/1/2014-12/30/2017  
**Title:** Preclinical Evaluation of a Novel Treatment for Acute Lung Injury  
**Total budget:** \$115,035  
**Role:** PI

**NIH CTSI small pilot grant** 4/1/2017 – 4/31/2018  
**(Medical College of Wisconsin CTSI)**  
**Title:** Multiple Organ Failure (MOF) from Sepsis Causes Skeletal Muscle Mitochondrial (MT) Fragmentation and Dysfunction (MOF – MT Fray)  
**Total budget:** \$50,000 (MU budget: \$7,122)  
**Role:** Co-I (6% effort) (PI: Dr. Dr. Rahul Nancal, Medical College of Wisconsin)

**NIH CTSI small pilot grant** 4/1/2016 – 4/31/2017  
**(Medical College of Wisconsin CTSI)**

**Title:** Role of endoplasmic reticulum in the evolution of bronchopulmonary dysplasia with pulmonary hypertension

**Total budget:** \$50,000 (MU budget: \$7,735)

**Role:** Co-I (6% effort) (PI: Dr. Ru-Jeng Teng, Medical College of Wisconsin)

**Opus College of Engineering**

4/1/2015-8/30/2015

**Title:** Optical Fluorescent Imaging: Assessment of the Effect of Hydrogen Gas on the Rate of Formation of Reactive Oxygen Species in Ex-Vivo Lungs of Rats Exposed to Hyperoxia

**Total budget:** \$5,000

**Role:** PI

**NIH CTSI small pilot grant**

4/1/2013 – 3/31/2014

**(Medical College of Wisconsin CTSI)**

**Total budget:** \$49,628

**Title:** Multi-scale pharmacokinetic modeling of imaging biomarkers for assessing acute lung injury.

**Role:** PI

**NIH CTSI K12 Award**

4/1/2011 – 4/1/2014

**Title:** Mitochondrial Redox Studies by Optical Spectroscopy and CryoImaging in Cardiopulmonary Oxidative Stress

**Role:** Co-Mentor to Dr. Mahsa Ranji (PI, University of Wisconsin-Milwaukee).

**NIH CTSI small pilot grant**

4/1/2013 – 3/31/2014

**(Medical College of Wisconsin CTSI)**

**Title:** Tetrahydrobiopterin in neonatal hyperoxic lung injury

**Total budget:** \$50,000 (MU budget: \$2,500)

**Role:** Co-I (PI: Dr. Ru-Jeng Teng, Medical College of Wisconsin)

**Summer Faculty Fellowship/Regular Research Grant**

1/21/2013 – 12/31/2013

**(Marquette University)**

**Title:** Understanding Lung Injury Using Mathematical Modeling of Imaging Agents

**Total budget:** \$19,500

**Role:** PI

**University of Wisconsin RGI**

7/1/2011-6/30/2012

University of Wisconsin Foundation

**Title:** Lung Oxygen Toxicity: Optical Biopsy and Imaging Techniques

**Total budget:** \$100,000 (MU budget: \$38,839)

**Role:** Co-PI (PI: Dr. Mahsa Ranji, University of Wisconsin-Milwaukee)

**NIH CTSI small pilot grant (MCW CTSI)**

4/1/2011 – 3/31/2012

**Title:** Mitochondrial Redox State and hyperoxic lung injury: Optical Spectroscopy and Cryo-Imaging Techniques

**Total budget:** \$50,000 (MU budget: \$18,500)

**Role:** Co-PI (PI: Dr. Mahsa Ranji, University of Wisconsin-Milwaukee)

**NIH CTSI pilot grant (MCW CTSI)**

4/1/2011 – 3/31/2012

**Title:** Mitochondrial oxidative stress in acute lung injury from sepsis

**Total budget:** \$100,000 (MU budget: \$8,104)

**Role:** Co-Investigator (PI: Dr. Ganesh Konduri, Medical College of Wisconsin)

**NIH NHLBI R01**

7/1/2007– 6/30/2012

**Title:** Lung Metabolism: Multiple Indicator Dilution

**Total budget:** \$1,026,320

**Role:** PI

**NIH NHLBI R01**

7/1/2007– 6/31/2012



- Title:** Lipid Modulators of Pulmonary Vascular Tone  
**Total budget:** \$1,203,498 (MU budget: \$55,740)  
**Role:** Co-investigator (PI: Dr. Elizabeth Jacobs, Medical College of Wisconsin)
- VA Medical Research (Merit Review)** 10/1/2005 -9/30/2009  
**Title:** Pulmonary Uptake of Amine Drugs  
**Total budget:** \$1,130,500 (MU budget: \$100,000)  
**Role:** Co-investigator (PI: Dr. David L. Roerig, Medical College of Wisconsin)
- Biomedical Technology Alliance (BTA)** 7/1/2006 – 6/30/2007  
**Title:** Quantification of Molecular Probe Uptake in Acute Myocardial Infarction  
**Total budget:** \$50,000 (MU budget: \$20,000)  
**Role:** Co-PI (PI: Dr. Ming Zhao, Medical College of Wisconsin/Northwestern University)
- NIH NHLBI R01** 9/1/2000 – 8/31/2006  
**Title:** Lung Metabolism: Multiple Indicator Dilution  
**Total budget:** \$1,243,382  
**Role:** PI (2002-2006), Co-PI (2000-2002)
- VA Medical Research (Merit Review)** 9/1/1999 -8/31/2004  
**Title:** Pulmonary Uptake of Amine Drugs  
**Total budget:** \$849,600 (MU budget: \$80,000)  
**Role:** Co-investigator (PI: Dr. David Roerig, Medical College of Wisconsin)
- Whitaker Foundation** 7/1/1996-1/31/2000  
**Title:** Detection of Pathophysiological Changes in Lung Perfusion and Tissue Composition Using Lipophilic Probes in the Multiple Indicator Dilution Method.  
**Total budget:** \$210,000  
**Role:** PI
- VA Medical Research (Merit Review)** 9/1/1995 -8/31/1999  
**Title:** Pulmonary Uptake of Amine Drugs  
**Total budget:** \$480,000 (MU budget: \$80,000)  
**Role:** Co-investigator (PI: Dr. David Roerig, Medical College of Wisconsin)
- Dr. Ralph and Marion Falk Medical Research Trust** 8/15/1997-8/15/2000  
**Title:** Pulmonary Hypertension  
**Total budget:** \$540,000 (MU budget: \$80,000)  
**Role:** Co-investigator (PI: Dr. Christopher Dawson, Medical College of Wisconsin)
- American Heart Association of Wisconsin Postdoctoral Fellowship** 7/1/1993-7/1/1995  
**Title:** In Vivo Estimation of the Pulmonary Capillary Transit Time Distribution  
**Total budget:** \$38,300  
**Role:** PI

## **Publications:**

### **I. Peer-Reviewed Journal Articles : *complete List of Published Work in MyBibliograph:***

<http://www.ncbi.nlm.nih.gov/sites/myncbi/said.audi.1/bibliography/41160836/public/?sort=date&direction=ascending>

1. Rizzo, B.M., E.Y. Sidky, **S.H. Audi**, T. Gilat-Schmidt, E.R. Jacobs, and A.V. Clough. Reconstruction for few-view multi-pinhole single photon emission computed tomography (SPECT) using TV-penalized fidelity optimization. *IEEE Transactions on Medical Imaging (in review)*.

2. Said H. Audi, Pardis Taheri, Ming Zhao, Elizabeth R. Jacobs, and Anne V. Clough. In vivo molecular imaging stratifies rats with different susceptibilities to hyperoxic acute lung injury AJP lung cellular and molecular physiology (revised, under review).
3. Joohyun Kim, Yongqiang Yang, Seung-Keun Hong, Jacek Zielonka, Ranjan Dash, Said Audi, Suresh Kumar, Amit Joshi, Michael Zimmerman, and Johnny Hong. Fluorescein Clearance Kinetics in Blood and Bile Indicates Hepatic Ischemia-Reperfusion Injury in Rats. *American Journal of Physiology-Gastrointestinal and Liver Physiology (in press)*
4. Xiao Zhang, Namrata Tomar, Sunil Kandel, Said Audi, Allen W. Cowley Jr. \*, Ranjan K. Dash \*Substrate and Calcium-Dependent Differential Regulation of Mitochondrial Oxidative Phosphorylation and Energy Production in the Heart and Kidney. *Cells* 11(1):131, 2021 doi: 10.3390/cells11010131. PMID: 35011693
5. Audi, SH, S Ganesh, P Taheri, X Zhang, RK Dash, AV Clough, and ER Jacobs. Depolarized Mitochondrial Membrane Potential and Protection with Duroquinone in Isolated Perfused Lungs from Rats Exposed to Hyperoxia. *Journal of Applied Physiology* Dec, 2021. PMID: 34941441
6. Namrata Tomar, Xiao Zhang, Sunil M. Kandel, Shima Sadri, Chun Yang, Mingyu Liang, Said H. Audi, Allen W. Cowley Jr, and Ranjan K. Dash. Substrate-Dependent Differential Regulation of Mitochondrial Bioenergetics in the Heart and Kidney Cortex and Outer Medulla. *Biochimica et Biophysica Acta – Bioenergetics* 1863(2):148518, 2022. PMID: 34864090
7. Audi, SH, ER Jacobs, P Taheri, S Ganesh, AV Clough. Assessment of protection offered by the Nrf2 pathway against hyperoxia-induced acute lung injury in Nrf2 knockout rats. *Shock* 57: 274–280, 2022. PMID: 34738958
8. Beyer A.M., Norwood L.E., Hughes W.E., Clough A.V., Gao F., Medhora M., **Audi S.H.**, Jacobs E.R. Mitophagy, TERT and mitochondrial dysfunction in hyperoxia. *AJP: Heart and Circulatory Physiology* 321(5):H985-H1003, 2021.
9. Jagtap J., **S.H. Audi**, B.L. Fish, C. Hansen, J. Narayan, F. Gao, G. Sharma, A.K. Parchur, C. Bergom, M. Medhora M, A. Joshi. A rapid dynamic in vivo near-infrared fluorescence imaging assay to track lung vascular permeability after acute radiation injury. *American Journal of Physiology: Lung Cellular and Molecular Physiology (accepted)*. Jan 6., 2021. PMID: 33404364
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### **Seminars and Invited Presentations:**

Poster presentation, Annual Experimental Biology meeting, Pittsburg, PA April 2-5, 2022. Title: "Depolarized mitochondrial membrane potential and protection with duroquinone in isolated perfused lungs from rats exposed to hyperoxia"

Invited speaker Advancing a Healthier Wisconsin, April 9, 2019. Title: "*Acute Respiratory Distress Syndrome (ARDS): Developing a Better Diagnostic Tool.*"

Invited speaker, Medical College of Wisconsin, December 5, 2014. Title: "Acute lung injury: In Vivo SPECT Imaging and Computational Modeling of Lung Tissue Redox State and Bioenergetics."

Invited speaker, Medical College of Wisconsin, Pulmonary and Critical Care Medicine Annual Research Retreat, Milwaukee, WI, February 11, 2014. Title: "SPECT Imaging for Early Detection of Acute Lung Injury."

Oral Presentation, Annual Fall Meeting of the Biomedical Engineering Society, Seattle, WA September 24-28, 2013. *In Vivo* Detection of Hyperoxia-Induced Pulmonary Endothelial Cell Death Using  $^{99m}\text{Tc}$ -Duramycin

Poster presentation, Annual Fall Meeting of the Biomedical Engineering Society, Atlanta, GA, October 24-27, 2012. Title: "Lung Uptake of  $^{99m}\text{Tc}$ - Hexamethylpropyleneamine Oxime ( $^{99m}\text{Tc}$ -HMPAO) in Two Unique Rat Models of Pulmonary Oxygen Toxic"

Poster presentation, American Thoracic Society Meeting, New Orleans, May 14-19, 2010. Title: "Capillary Perfusion Kinematics in Isolated Lungs of Oxygen-Tolerant Rats."

Oral Presentation, Annual Fall Meeting of the Biomedical Engineering Society, Pittsburgh, PA October 7-10, 2009. Title: "Redox metabolism of quinone compounds during passage through lungs of oxygen-tolerant rats."

Oral Presentation, Annual Fall Meeting of the Biomedical Engineering Society, St. Louis, MO October 1-4, 2008. Title: "A novel approach for measuring intact pulmonary endothelial cells mitochondrial membrane potential."

Poster Presentation, American Thoracic Society, Toronto Canada, May 16-21, 2008. Title: "Novel Use of Rhodamine 123 (R123) as an Extracellular Probe Of Mitochondrial Membrane Potential ( $\Delta\phi$ ) In Intact Pulmonary Arterial Endothelial Cells (PAEC)."

Oral Presentation, Annual Fall Meeting of the Biomedical Engineering Society, Los Angeles, CA September 26-29, 2007. Title: "Coenzyme Q1 Reduction During Passage Through the Rat Pulmonary Circulation and the Effect of Hyperoxia."

Invited Speaker, Department of Biomedical Engineering, Tulane University, June 18, 2007. Title: "Probing Redox Processes in the Intact Lung: Multiple Indicator Dilution."

Moderator, *Ventilation and Perfusion Session*, Mathematical Biosciences Institute Workshop, Ohio State University, November (6-10), 2006.

Invited Speaker, Medical College of Wisconsin, Mitochondria Interest Research Group, Milwaukee, November 21, 2006, title: "Probing Lung Redox Functions *In Situ*."

Invited Speaker, Hariri Canadian University, Mechref, Lebanon, July 3, 2006. Title: "Probing Lung Metabolic Functions *In Situ*."

Oral Presentation, Annual Fall Meeting of the Biomedical Engineering Society, Chicago, Illinois, October 11-14, 2006. Title: "In Situ Detection of Hyperoxia-Induced Decrease in Rat Lung Mitochondrial Complex I Activity."

Invited Speaker at the Spring 2006 Research Retreat, Department of Pulmonary and Critical Care Medicine, Medical College of Wisconsin, Milwaukee, May 2, 2006, title: "*In Situ* Evaluation of the Effects of Hyperoxia on Pulmonary Capillary Endothelium Redox Functions."

Poster Presentation, Experimental Biology (FASEB) Annual Spring Meeting, San Francisco, April 2006. Title: "Early decrease in rotenone-sensitive Coenzyme Q1 reduction in intact lungs from rats exposed to hyperoxia."

Seminar Presentation, Department of Pulmonary and Critical Care Medicine, Medical College of Wisconsin, Milwaukee, December 5, 2005, title: "Probing Lung Tissue Redox Functions *In Situ*."

Oral Presentation, Annual Fall Meeting of the Biomedical Engineering Society, Philadelphia, Pennsylvania, October 13-16, 2004. Title: "Probing Changes In Rat Lung Redox Status Associated With Hyperoxia Induced Oxidative Stress."

Experimental Biology (FASEB) Annual Spring Meeting, Washington D.C., April 2003. Title: "Effects of Chronic Exercise and Hyperoxia on Quinone Reduction in Rat Lungs."

Seminar Presentation, Marquette University BMES chapter, November 17, 2003, title: "Lung: A chemical reactor."

Seminar Presentation, Institute for Environmental Medicine, University of Pennsylvania, Philadelphia, October 24, 2003, title: "Probing Pulmonary Redox Function *In Situ*."

Invited participant at the 2003 Annual Fall Meeting of the Biomedical Engineering Society, Nashville, Tennessee, October 1-4, 2003. Title: "Adaptation of Pulmonary Capillary Endothelium Redox Metabolism to Oxidative Stress."

Seminar Presentation, Department of Biomedical Engineering, Marquette University, Milwaukee, WI, March 11, 2002. Title: "Probing Mechanisms of Adaptation in Lungs."

Invited participant at the 2000 Annual Fall Meeting of the Biomedical Engineering Society, Seattle, Washington, October 12-14. Title: "Mechanism of Pulmonary Reduction of Blood-Borne Electron Acceptors."

Seminar Presentation, Department of Biomedical Engineering, Marquette University, Milwaukee, WI, October 6, 2000. Title: "Probing Mitochondrial Functions *In Situ*."

Seminar Presentation, Department of Bioengineering, University of Washington, Seattle, Washington, May 4, 2000. Seminar title: "Probing Mitochondrial Functions *In Situ*."

Seminar Presentation, Department of Biomedical Engineering, Marquette University, October 30, 1998. Title: "Detection of Pathophysiological changes in Lung Tissue Properties With Multiple Indicator Dilution."

Invited participant at the 1998 Annual Fall Meeting of the Biomedical Engineering Society, Cleveland, Ohio, October 10-13, 1998. Title: "Lipophilic Amine Compounds as Probes for Detecting Lung Inflammation in the Multiple Indicator Dilution Method."

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Invited participant at the 1997 National Simulation Resource on Mathematical modeling Symposium, Milwaukee, WI. Title: "Accounting For the Heterogeneity of Capillary Transit Times in the Modeling of Multiple Indicator Dilution Data."

Invited participant at the 1996 Annual Fall Meeting of the Biomedical Engineering Society, University Park, Pennsylvania, October 3-6, 1996. Title: "Lipophilic Amine Compounds (LAC) as Probes for Detecting Lung Inflammation in the Multiple Indicator Dilution (MID) Method."

Invited participant at the 27th Annual Biomedical Engineering Society meeting, Boston, Mass, October 6-8, 1995. Title: "Distributed In Time and Space Recirculation Model of the Pulmonary Endothelial Uptake of 18F-Fluorocaptopril."

Invited speaker at the international symposium on "Whole Organ Approach to Cellular Metabolism" in Montreal, Canada, July 14-16, 1995. Title: "Lipophilic Amines as Probes for Measurement of Lung Capillary Transport Function and Tissue Composition Using the Multiple Indicator Dilution Method."

Invited speaker at Milwaukee Conference on Biomedical Engineering and Biomathematics, Milwaukee, WI, April 21, 1995. Title: "An Overview of the Multiple Indicator Dilution Technique and its Applications in the Lungs."

Marquette University Biomedical Engineering Symposium. April, 1995. Title: "Detection of Changes in The Pulmonary Capillary Perfused Surface Area With Flow Using the Multiple Indicator Dilution Technique."

Marquette University Biomedical Engineering Symposium. April, 1994. Title: "Pulmonary Capillary Transport Function."

Invited seminar at University of British Columbia Pulmonary Research Laboratory, Vancouver, Canada, November 14, 1994. Title: "Estimation of the Capillary Transit Time Distribution Using Rapidly Equilibrating Indicators".

Invited speaker at the Milwaukee Conference on Biomedical Engineering and Biomathematics, Milwaukee, WI, April 22, 1994. Title: "Pulmonary Capillary Transit Time in Rabbit Lungs."

Invited participant at the 26th Annual Biomedical Engineering Society meeting, Tempe, Arizona, October 21-24, 1994. Title: "Pulmonary Capillary Transit Time Distribution in Isolated Rabbit Lungs."

Invited participant at the 25th Annual Biomedical Engineering Society Meeting, Memphis, TN, October 21-24, 1993. Title: "Pulmonary Capillary Transit Time Distribution."

Seminar Presentation, Department of Physiology, Medical College of Wisconsin, June 6, 1990. Title: "Localization of Sites of Pulmonary Vasomotion Using the Occlusion Method."

Seminar Presentation, Division of Pulmonary and Critical Care Medicine, Medical College of Wisconsin, November 19, 1990. Title: "Indirect Identification of Sites of Pulmonary Vasomotion."

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