BIOGRAPHICAL SKETCH

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NAME: Siddharthan, Trishul

eRA COMMONS USER NAME (credential, e.g., agency login): T_SIDDHARTHAN

POSITION TITLE: Associate Professor, Pulmonary and Critical Care Medicine

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	Completion Date MM/YYYY	FIELD OF STUDY
University of Miami, Coral Gables FL	B.S.	06/07	Neurobiology and Chemistry
University of Miami School of Medicine, Miami FL	M.D.	05/11	Medicine
Yale University, New Haven CT	Postgraduate medical training	05/14	Internal Medicine
Johns Hopkins University, Baltimore MD	Postgraduate medical training	06/19	Pulmonary Critical Care Medicine

A. Personal Statement

The current proposal aims to determine aims to determine (a) if changes in ventilation heterogeneity ($\dot{V}_H$) can serve as a predictive biomarker for therapeutic response to IL-5 Rα blockade in asthma, and whether persistent $\dot{V}_H$ is linked to persistent inflammation among non-responders; and (b) how different asthma endotypes affect $\dot{V}_H$ in connection with T_H2 and non- T_H2 lung tissue inflammation and spatial transcriptomic signatures in murine models. Our hypothesis is that is that $\dot{V}_H$ is a marker of airway inflammation and associated airway remodeling in asthma. The investigative team includes established investigators in asthma, functional lung imaging and airway inflammation and leverages existing infrastructure at the University of Miami and Cleveland Clinic Foundation. I am well positioned to execute this proposal given my research focuses on the diagnosis and management of chronic respiratory domestically and globally, including experience phenotyping chronic obstructive lung diseases. I have ten years' experience conducting observational studies and clinical trials related to respiratory disease in a range of settings. I am currently PI on a randomized controlled trial assessing the effectiveness of pharmacotherapy for the management of COPD among never-smokers (NHLBI K23HL146946) as well a study to characterize $\dot{V}_H$ as a marker of airways disease.

Ongoing and recently completed projects that I would like to highlight include:

4/01/2023 – 3/31/2028
ALHI
Siddharthan, Punjabi (MPI)
Functional Lung Imaging to Assess Respiratory Disease
4/01/2023 – 3/31/2028

Citations:

1. **Siddharthan T**, Grealis K, Kirkness JP, Ötvös T, Stefanovski D, Tombleson A, Dalzell M, Gonzalez E, Nakrani KB, Wenger D, Lester MG, Richmond BW, Fouras A, Punjabi NM. Quantifying ventilation by X-ray velocimetry in healthy adults. Respir Res. 2023 Aug 30;24(1):215. doi: 10.1186/s12931-023-02517-z. PMCID: PMC10469820
2. **Siddharthan T**, Xu Z, Spottiswoode B, Schettino C, Siegel Y, Georgiou M, Eluvathingal T, Geiger B, Grbic S, Gosh P, Fahmi R, Punjabi N. A multi-stage 3D convolutional neural network algorithm for CT-based lung segment parcellation. J Appl Clin Med Phys. 2025 Aug;26(8):e70193. PMCID: PMC12284833
3. Karmali D, Afanador-Castiblanco S, Ötvös T, Aguilar G, Hossen S, Eikelis N, Nilsen K, Punjabi NM, **Siddharthan T**, Kirkness JP. Regional Lung Volume Changes with Non-Invasive Positive Pressure Ventilation in Healthy Adults. J Appl Physiol (1985). 2025 Feb 12. PMID: 39938869.
4. **Siddharthan T**, Pollard SL, Quaderi SA, Rykiel NA, Wosu AC, Alupo P, Barber JA, Cárdenas MK, Chandyo RK, Flores-Flores O, Kirenga B, Miranda JJ, Mohan S, Ricciardi F, Sharma AK, Das SK, Shrestha L, Soares MO, Checkley W, Hurst JR; GECo Study Investigators. Discriminative Accuracy of Chronic Obstructive Pulmonary Disease Screening Instruments in 3 Low- and Middle-Income Country Settings. *JAMA*. 2022 Jan 11;327(2):151-160. doi: 10.1001/jama.2021.23065. PMCID: PMC8753498.

B. Positions and Honors

Positions and Employment

2024 – current	Director, Clinical Research, Pulmonary and Critical Care Medicine, University of Miami
2023 – current	Associate Professor, Pulmonary and Critical Care Medicine, University of Miami
2020 – current	Assistant Professor, Adjunct, Pulmonary and Critical Care Medicine, Johns Hopkins University
2020 – 2023	Assistant Professor, Pulmonary and Critical Care Medicine, University of Miami
2019 – 2020	Assistant Professor, Pulmonary and Critical Care Medicine, Johns Hopkins University
2015 – 2019	Postdoctoral Fellow, Pulmonary and Critical Care Medicine, Johns Hopkins University
2015 – 2016	Clinical Instructor, Adjunct, Internal Medicine, Yale University
2014 – 2024	Board Certification, Internal Medicine, American Board of Internal Medicine
2014 – 2015	Chief Residency, Internal Medicine, Yale University
2012 – 2014	Residency, Internal Medicine, Yale University
2011 – 2012	Internship, Internal Medicine, Yale University

Other Experiences and Professional Memberships

2016 – current	Member, Society of Critical Care Medicine
2015 – current	Member, American Thoracic Society
2015 – current	Member, American College of Chest Physicians
2012 – 2015	Member, American Medical Association

Academic and Professional Honors

2025	Fellow, American Thoracic Society
2020	Fellow, American College of Chest Physicians
2019	Career Mentored Development Award, National Heart, Lung and Blood Institute, NIH
2017	National Research Service Award, National Institute of Environmental Health Sciences, NIH
2015	Fogarty Global Health Post-Doctoral Fellowship, UMJT Global Health Consortium, Fogarty Global Health Center, NIH
2014	Fulbright Scholar, J. William Fulbright Foreign Scholarship Board
2012	Johnson & Johnson Global Health Scholar, Yale University
2006	Phi Beta Kappa

C. Contributions to Science

I have co-authored 105 publications with an h-index of 27 accessed on 09/28/2025.

1. **Functional Lung Imaging in Acute and Chronic Respiratory Disease**: Acute and chronic respiratory diseases are a leading cause of death globally and affects approximately 1 billion adults. Functional lung imaging allows for the assessment of physiologic correlates to pathologic changes in the lung in a range of respiratory conditions. We have previously demonstrated that lung displacement on standard fluoroscopy can be utilized to derive flow and volume. Additionally, I have utilized lung imaging, such as ultrasound, to assess disease trajectories in acute respiratory failure in a range of global settings. The work to date has additionally contributed to guidelines on the use of these emerging technologies in disease management.
    a. Karmali D, Sowho M, **Bose S**, Pearce J, Tejwani V, Diamant Z, Yarlagadda K, Ponce E, Eikelis N, Otvos T, Khan A, Lester M, Fouras A, Kirkness J, **Siddharthan T**. Functional imaging for assessing regional lung ventilation in preclinical and clinical research. *Frontiers in medicine*. 2023 May 16;10:1160292. doi: 10.3389/fmed.2023.1160292. PMCID: PMC10228734
    b. **Siddharthan T**, Grealis K, Kirkness JP, Ötvös T, Stefanovski D, Tombleson A, Dalzell M, Gonzalez E, Nakrani KB, Wenger D, Lester MG, Richmond BW, Fouras A, Punjabi NM. Quantifying ventilation by X-ray velocimetry in healthy adults. Respir Res. 2023 Aug 30;24(1):215. doi: 10.1186/s12931-023-02517-z. PMCID: PMC10469820.
    c. **Siddharthan T**, Xu Z, Spottiswoode B, Schettino C, Siegel Y, Georgiou M, Eluvathingal T, Geiger B, Grbic S, Gosh P, Fahmi R, Punjabi N. A multi-stage 3D convolutional neural network algorithm for CT-based lung segment parcellation. J Appl Clin Med Phys. 2025 Aug;26(8):e70193. PMCID: PMC12284833
    d. Richmond B, Lester MG, Lui V, Dusting J, Raju S, Snell GI, Blackburn JB, Douglas K, Miller RF, **Siddharthan T**, Fouras A. X-ray Velocimetry Provides Temporally and Spatially-Resolved Biomarkers of Lung Ventilation in Small Airways Disease. *Respir. Res.* 2025 Jul 2;26(1):226. PMID: 40604808

2. **Global Epidemiology of Chronic Respiratory Disease**: I have contributed to the understanding of the epidemiology and attributable risk concerning respiratory diseases in low-and middle-income settings (LMICS), where approximately 90% of disease related mortality occurs. Specifically, I have provided estimates on the burden of asthma, COPD and chronic bronchitis globally, as well as contributed to the understanding of novel risk factors beyond smoking (e.g. biomass exposure, poverty and tuberculosis exposure). Additionally, I have collaborated with other investigators to compile one of the largest datasets concerning spirometry and respiratory symptoms across 13 low- and middle-income settings.
    a. Grigsby M, **Siddharthan T**, Chowdhurry MAH, Siddiquee A, Rubinstein A, Sobrino E, Miranda JJ, Bernabe-Ortiz A, Alam D, Checkley W. Socioeconomic status and COPD among low- and middle-income countries. *Int J Chron Obstruct Pulmon Dis*. 2016 Oct 5;11:2497-2507. PMCID: PMC5065097.
    b. **Siddharthan T**, Grigsby M, Miele CH, Bernabe-Ortiz A, Miranda JJ, Gilman RH, Wise RA, Porter JC, Hurst JR, Checkley W, CRONICAS Cohort Study Group. Prevalence and risk factors of restrictive spirometry in a cohort of Peruvian adults*. Int J Tuberc Lung Dis*. 2017 Sep 1;21(9):1062-8. PMCID: PMC8558895.
    c. **Siddharthan T**, Grigsby M, Goodman D, Chowdhurry M, Rubenstein A, Irazola V, Gutierrez L, Miranda JJ, Bernabe-Ortiz A, Alam D, Kirenga B, Jones R, van Gemert F, Wise RA, Checkley W. Association between household air pollution exposure and chronic obstructive pulmonary disease outcomes in 13 low- and middle-income countries. *Am J Resp Crit Care Med.* 2018 Mar 1;197(5):611-620 PMCID: PMC6005243
    d. **Siddharthan T**, Grigsby M, Morgan B, Kalyesubula R, Wise RA, Kirenga B, Checkley W. Prevalence of chronic respiratory disease in urban and rural Uganda. *Bull World Health Organ*. 2019 May 1;97(5):318-27. PMCID: PMC6747035.

3. **Management of Non-Communicable Diseases in LMICs:** My work related to understanding the effectiveness of interventions for the management of chronic respiratory disease across a range of resource settings. Specifically, using interventions adapted to low- and middle-income resource settings, I have examined the clinical and cost-effectiveness of COPD screening and community-worker based management. I have additionally contributed to guidelines related to the management of respiratory diseases globally, with a focus on cost-effective interventions and access to medications.
    a. **Siddharthan T**, Ramaiya K, Yonga G, Mutungi G, Rabin T, List J, Kishore S, Schwartz J. Noncommunicable Diseases In East Africa: Assessing The Gaps In Care And Identifying Opportunities For Improvement*. Health Aff*, 2015 Sep;34(9):1506-13. PMID: 26355052

b. Hurst JR, Buist AS, Gaga M, Gianella GE, Kirenga B, Khoo EM, Mendes RG, Mohan A, Mortimer K, Rylance S, **Siddharthan T**, Singh SJ, van Boven JFM, Williams S, Zhang J, Checkley W. Challenges in the Implementation of Chronic Obstructive Pulmonary Disease Guidelines in Low- and Middle-Income Countries: An Official American Thoracic Society Workshop Report. *Ann Am Thorac Soc*. 2021 Aug;18(8):1269-1277. PMCID: PMC8513652.
c. **Siddharthan T**, Robertson NM, Rykiel NA, Underhill LJ, Rahman N, Kafle S, Mohan S, Padalkar R, McKeown S, Flores-Flores O, Quaderi SA, Alupo P, Kalyesubula R, Kirenga B, Luo J, Cárdenas MK, Gianella G, Miranda JJ, Checkley W, Hurst JR, Pollard SL. Availability, affordability and access to essential medications for asthma and chronic obstructive pulmonary disease in three low- and middle-income country settings. PLOS Glob Public Health. 2022 Dec 16;2(12):e0001309. PMCID: PMC10021856.
d. **Siddharthan T**, Pollard SL, Quaderi SA, Rykiel NA, Wosu AC, Alupo P, Barber JA, Cárdenas MK, Chandyo RK, Flores-Flores O, Kirenga B, Miranda JJ, Mohan S, Ricciardi F, Sharma AK, Das SK, Shrestha L, Soares MO, Checkley W, Hurst JR; GECo Study Investigators. Discriminative Accuracy of Chronic Obstructive Pulmonary Disease Screening Instruments in 3 Low- and Middle-Income Country Settings. *JAMA*. 2022 Jan 11;327(2):151-160. doi: 10.1001/jama.2021.23065. PMCID: PMC8753498.

Complete List of Published Work in MyBibliography:
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