

**CURRICULUM VITAE**  
Johns Hopkins University School of Medicine



**Lonny Yarmus, DO, MBA**

**January 25, 2021**

**DEMOGRAPHIC AND PERSONAL INFORMATION**

**Current Appointments**

2015-present Associate Professor of Medicine, Johns Hopkins University School of Medicine  
2015-present Associate Professor of Oncology, Johns Hopkins University School of Medicine  
2014-present Clinical Director, Division of Pulmonary and Critical Care Medicine, Johns Hopkins University  
2014-present Director, Interventional Pulmonology, Johns Hopkins Bayview Medical Center  
2010-present Co-Director, Interventional Pulmonology, Johns Hopkins Hospital

**Personal Data**

Division of Pulmonary and Critical Care Medicine  
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**Education and Training**

**Undergraduate**

1994 Bachelor of Arts., Emory University, Atlanta, GA

**Doctoral/Graduate**

1995-1997 Health Careers Postbaccalaureate, Harvard University, Boston, MA  
1999-2003 Doctor of Osteopathy, University of New England, Biddeford, ME  
2013-2018 Masters of Business Administration, Johns Hopkins University Carey School of Business

**Postdoctoral**

2003-2004 Intern, Internal Medicine, Tufts Univ School of Medicine, Maine Medical Center, Portland, ME  
2004-2006 Resident, Internal Medicine, Tufts University Sch of Medicine, Maine Medical Center, Portland, ME  
2006-2009 Postdoctoral Fellow, Pulmonary Critical Care Med, Tufts Univ, Maine Medical Center, Portland, ME  
2009-2010 Postdoctoral Fellow, Interventional Pulmonology, Pulmonary & Critical Care Med, Johns Hopkins  
2010-2011 Science of Clinical Investigation Certificate Program, Johns Hopkins Bloomberg Sch Public Health

**Professional Experience**

1996-1998 Teaching Fellow, Department of Physics, Harvard University, Boston, MA  
1998-1999 Teacher, Department of Physics, North Springs Charter High School, Sandy Springs, GA  
2010-2011 Instructor of Medicine, Johns Hopkins University School of Medicine, Baltimore, MD  
2011-2015 Fellowship Program Director, Interventional Pulmonary, Division of Pulmonary and Critical Care, Johns Hopkins University School of Medicine, Baltimore, MD  
2011-2015 Assistant Professor of Medicine, Johns Hopkins University School of Medicine, Baltimore, MD  
2012-present Instructor, Pulmonary Section, Second Year Medical School Curriculum, Genes-to-Society Course, Johns Hopkins University School of Medicine, Baltimore, MD  
2014-present Clinical Director, Division of Pulmonary and Critical Care Medicine, Johns Hopkins University School of Medicine, Baltimore, MD  
2015-present Associate Professor of Medicine, Johns Hopkins University School of Medicine, Baltimore, MD  
2017-present Associate Professor of Oncology, Johns Hopkins University School of Medicine, Baltimore, MD

## PUBLICATIONS

### Original Research [OR]

1. Restrepo A, Johnson TC, Widjaja D, **Yarmus L**, Meyer K, Clain DJ, Bodenheimer HC Jr, Min AD. The rate of treatment of HCV in patients co-infected with HIV. *J Viral Hepatology*. 2005 Jan 12(1): 86-90.
2. **Yarmus L**, Napier M, Van der Kloot T, Feller-Kopman, D. A Randomized Prospective Trial of Rapid On-Site Transbronchial Needle Aspirate Specimens. *J Bronchol Interv Pulmonol*. 2011 Apr;18(2):121-127.
3. Harvey C, Thimmulappa R, Sethi S, **Yarmus L**, Feller-Kopman D, Wise R, Biswal S. Targeting Nrf2 signaling improves bacterial clearance by alveolar macrophages in patients with COPD and in a mouse model. *Sci Transl Med*. 2011 Apr 13;3(78):78ra32.
4. Ost D, Ernst A, Lei X, Feller-Kopman D, **Yarmus L**, Simoff M. Diagnostic Yield of Endobronchial Ultrasound Guided Transbronchial Needle Aspiration: Results of the AQUIRE Registry. *Chest*. 2011 Dec;140(6):1557-1566  
*\*served as a founder member of the AQUIRE executive committee and site principal investigator\**
5. Tsai HC, Li H, Van Neste L, Cai Y, Robert C, Rassool FV, Shin JJ, Harbom KM, Beaty R, Pappou E, Harris J, Yen RW, Ahuja N, Brock MV, Stearns V, Feller-Kopman D, **Yarmus L**, Lin YC, Welm AL, Issa JP, Minn I, Matsui W, Jang YY, Sharkis SJ, Baylin SB, Zahnow CA. Transient Low Doses of DNA-Demethylating Agents Exert Durable Antitumor Effects on Hematological and Epithelial Tumor Cell. *Cancer Cell*. 2012 Mar 20;21(3): 430-446.
6. Eberlein M, Arnaoutakis GJ, **Yarmus L**, Feller-Kopman D, Dezube R, Chahla MF, Bolukbas S, Reed RM, Klesney-Tait J, Parekh KR, Merlo CA, Shah AS, Orens JB, Brower RG. The effect of lung size mismatch on complications and resource utilization after bilateral lung transplantation. *J Heart Lung Transplant*. 2012 May; 31(5):492-500.
7. **Yarmus L**, Pandian V, Gilbert C, Schiavi A, Haider A, Chi A, Morad A, Miller C, Efron D, Stevens K, Gangidi S, Vaswani R, Haut E, Mirski M, Bhatti N, Feller-Kopman D. Safety and efficiency of interventional pulmonologists performing percutaneous tracheostomy. *Respiration*. 2012 Jun; 84(2):123-7.
8. Mirski MA, Pandian V, Bhatti N, Haut E, **Yarmus L**, D, Morad A, Haider A, Schiavi A, Efron D, Ulatowski J. Safety, efficiency, and cost-effectiveness of a multidisciplinary percutaneous tracheostomy program. *Crit Care Med*. 2012 Jun;40(6):1827-34.
9. Yung RC, Otell S, Illei P, Clark DP, Feller-Kopman D, **Yarmus L**, Askin F, Gabrielson E, Li QK. Improvement of cellularity on cell block preparations using the so-called tissue coagulum clot method during endobronchial ultrasound-guided transbronchial fine-needle aspiration. *Cancer Cytopathol*. 2012 Jun 25;129(3):185-195.
10. **Yarmus L**, Gilbert C, Akulian J, Feller-Kopman D. 2012. Novel Use of the Glide Scope for Rigid bronchoscopic placement of a Dynamic Y stent. *Annals of Thoracic Surgery*. 2012 Jul;94(1):308-10.
11. Pandian V, Gilstrap DL, Mirski MA, Haut ER, Haider AH, Efron DT, Bowman NM, **Yarmus LB**, Bhatti NI, Stevens KA, Vaswani R, Feller-Kopman D. Predictors of short-term mortality in patients undergoing percutaneous dilatational tracheostomy. *J Crit Care*. 2012 Aug;27(4): 420.e9-15.
12. Pandian V, Miller CR, Mirski MA, Schiavi AJ, Morad AH, Vaswani RS, Kalmar CL, Feller-Kopman DJ, Haut ER, **Yarmus LB**, Bhatti NI. Multidisciplinary team approach in the management of tracheostomy patients. *Otolaryngol Head Neck Surg*. 2012 Oct; 147(4):684-691.
13. **Yarmus LB**, Akulian J, Gilbert C, Illei P, Dedhiya P, Merlo CA, Orens JB, Feller-Kopman D. Cryoprobe transbronchial lung biopsy in lung transplant patients: A Safety Pilot. *Chest*. 2013 Mar;143(3):621-6.  
*\*First study investigating a novel approach to assess host rejection in lung transplantation patients\**
14. Akulian J, **Yarmus L**, Feller-Kopman D. The evaluation and clinical application of pleural physiology. *Clin Chest Med*. 2013 Mar;34(1):11-9.
15. **Yarmus LB**, Akulian JA, Gilbert C, Mathai SC, Sathiyamoorthy S, Sahetya S, Harris K, Gillespie C, Haas A, Feller-Kopman D, Serman D, Lee HJ. Comparison of moderate vs. deep sedation for endobronchial ultrasound transbronchial needle aspiration. *Ann Am Thoracic Soc*. 2013 Apr; 10(2):121-126.
16. Eapen GA, Shah AM, Lei X, Jimenez CA, Morice RC, **Yarmus L**, Filner J, Ray C, Michaud G, Greenhill SR, Sarkiss M, Casal R, Rice D, Ost DE. Complications, consequences, and practice patterns of endobronchial ultrasound-guided transbronchial needle aspiration: Results of the AQUIRE registry. *Chest*. 2013 Apr;143(4): 1044-53.
17. **Yarmus LB**, Akulian J, Lechtzin N, Yasin F, Kamdar B, Ernst A, Ost DE, Ray C, Greenhill SR, Jimenez CA, Filner J, Feller-Kopman D. Comparison of 21-gauge and 22-gauge aspiration needle in endobronchial

- ultrasound-guided transbronchial needle aspiration: results of the American College of Chest Physicians Quality Improvement Registry, Education, and Evaluation Registry. *Chest*. 2013 Apr;143(4):1036-43.
18. Feller-Kopman D, Brigham E, Lechtzin N, **Yarmus L**. Training perspective: The Impact of starting an EBUS Program at a major academic center on Fellows' training of TBNA. *Ann Am Thorac Soc*. 2013 Apr;10(2):127-30.
  19. Gilbert C, Akulian J, Feller-Kopman D, **Yarmus L**. Ergonomics and Bronchoscopy: A Survey of the American Association of Bronchology and Interventional Pulmonology. *J Bronchology Interv Pulmonol*. 2013 Apr;20(2):113-20.
  20. Lee H, Feller-Kopman D, Shepherd RW, Almeida F, Bechara R, Berkowitz D, Chawla M, Folch E, Gillespie C, Haas A, Lee R, Majid A, Malhotra R, Musani A, Puchalski J, Sterman D, **Yarmus L**. Validation of an Interventional Pulmonary examination. *Chest*. 2013 Jun;143(6):1667-70.
  21. De Souza Lawrence L, Ford E, Gilbert C, **Yarmus LB**, Meneshian A, Feller-Kopman D, Hales R. Novel applications of an injectable radio-opaque hydrogel tissue marker for management of thoracic malignancies. *Chest*. 2013 Jun;143(6):1635-41.
  22. **Yarmus L**, Feller-Kopman D, Imad M, Kim S, Lee H. Procedural Volume and Structure of Interventional Pulmonary Fellowships: A Survey of Fellows and Fellowship Program Directors. *Chest*. 2013 Sep;144(3):935-9 \*This study resulted in efforts to standardize curricula across all IP fellowships nationwide\*
  23. Gilbert C, Akulian J, Feller-Kopman D, Hayes M, **Yarmus L**. Interventional Pulmonology Procedures in the Pediatric Population. *Pediatr Pulmonol*. 2014. Jun;49(6):597-604.
  24. **Yarmus LB**, Gilbert C, Lechtzin N, Imad M, Ernst A, Feller-Kopman D. The safety and feasibility of Interventional Pulmonologists performing bedside percutaneous endoscopic gastrostomy tube placement. *Chest*. 2013 Aug;144(2):436-40.
  25. Zarogoulidis P, Petridis D, Ritzoulis C, Darwiche K, Spyrtos D, Huang H, Goldberg EP, **Yarmus L**, Li Q, Freitag L, Zarogoulidis K. Establishing the optimal nebulization system for paclitaxel, docetaxel, cisplatin, carboplatin and gemcitabine: Back to drawing the residual cup. *Int J Pharm*. 2013 Sep 10;453(2):480-7.
  26. Gilbert CR, Chen A, Akulian JA, Lee HJ, Wahidi M, Argento AC, Tanner NT, Pastis NJ, Harris K, Sterman D, Toth JW, Chenna PR, Feller-Kopman D, **Yarmus L**. The use of convex probe endobronchial ultrasound-guided transbronchial needle aspiration in a pediatric population: A multicenter study. *Pediatr Pulmonol*. 2014. Aug;49(8):807-15.
  27. Sussan TE, Ingole V, Kim JH, McCormick S, Negherbon J, Fallica J, Akulian J, **Yarmus L**, Feller-Kopman D, Wills-Karp M, Horton MR, Breyse PN, Agrawal A, Juvekar S, Salvi S, Biswal S. Source of Biomass Cooking Fuel Determines Pulmonary Response to Household Air Pollution. *Am J Respir Cell Mol Biol*. 2014. Mar;50(3):538-48.
  28. Zarogoulidis P, Petridis D, Ritzoulis C, Darwiche K, Kioumis I, Porpodis K, Spyrtos D, Hohenforst-Schmidt W, **Yarmus L**, Huang H, Li Q, Freitag L, Zarogoulidis K. Internal mouthpiece designs as a future perspective for enhanced aerosol deposition. Comparative results for aerosol chemotherapy and aerosol antibiotics. *Int J Pharm*. 2013 Nov 18;456(2):325-31
  29. Fysh ET, Tremblay A, Feller-Kopman D, Mishra EK, Slade M, Garske L, Clive AO, Lamb C, Boshuizen R, Ng BJ, Rosenstengel AW, **Yarmus L**, Rahman NM, Maskell NA, Lee YC. Clinical Outcomes of Indwelling Pleural Catheter-Related Pleural Infections: an international multicenter study. *Chest*. 2013 Nov;144(5):1597-1602.
  30. Akulian J, **Yarmus L**, Feller-Kopman D. Tissue acquisition and specimen processing in the diagnosis of NSCLC. *Semin Respir Crit Care Med*. 2013 Dec;34(6):787-91.
  31. **Yarmus L**, Akulian J, Gilbert C, Feller-Kopman D, Lechtzin N, Ali S, Sathiyamoorthy V. Optimizing Endobronchial Ultrasound for Molecular Analysis: How many passes are needed? *Ann Am Thorac Soc*. 2013 Dec;10(6):636-43.
  32. Sorokina A, Danilevskaya O, Averyanov A, Zabozaev F, Sazonov D, **Yarmus L**, Lee HJ. Comparative study of ex vivo probe-based confocal laser endomicroscopy and light microscopy in lung cancer diagnostics. *Respirology*. 2014 Aug;19(6):907-13.
  33. **Yarmus L**, Lee H, Kidd D, Ortiz R, Thompson R, Akulian J, Gilbert C, Hughes A, Arias S, Feller-Kopman D. Comparison of Pleural Pressure Measuring Instruments. *Chest*. 2014. Oct;146(4):1007-12.
  34. Tsiouda T, Zarogoulidis P, Petridis D, Pezirkianidis N, Kioumis I, **Yarmus L**, Huang H, Li Q, Hohenforst-Schmidt W, Porpodis K, Spyrtos D, Tsakiridis K, Pitsiou G, Kontakiotis T, Argyropoulou P, Kyriazis G,

- Zarogoulidis K. A multifactorial analysis of 1452 patients for smoking sensation. An outpatient lab experience. *J Cancer*. 2014 May 10;5(6):433-45
35. Gilbert C, Akulian J, Ortiz R, Lee H, **Yarmus L**. Novel bronchoscopic strategies for the diagnosis of peripheral lung lesions: present techniques and future directions. *Respirology*. 2014 Jul;19(5):636-44.
  36. Hohenforst-Schmidt W, Zarogoulidis P, Linsmeier B, Kioumis I, Li Q, Huang H, Sachpatzidou D, Lampaki S, Organtzis J, Domvri K, Sakkas L, Zachariadis GA, Archontas KN, Kallianos A, Rapti A, **Yarmus L**, Zarogoulidis K, Brachmann J. Enhancement of Aerosol Cisplatin Chemotherapy with Gene Therapy Expressing ABC10 protein in Respiratory System. *Cancer*. 2014 Mar 24;5(5):344-50.
  37. Lithoxopoulou H, Zarogoulidis K, Bostantzopoulou S, Eleftheriadou E, Zarogoulidis P, Huang H, Porpodis K, Kioumis I, Tsiouda T, **Yarmus L**, Kontakiotis T. Monitoring changes in quality of life in patients with lung cancer by using specialised questionnaires: implications for clinical practice. *Support Care Cancer*. 2014 Aug;22(8):2177-83.
  38. Hohenforst-Schmidt W, Banckwitz R, Zarogoulidis P, Vogl T, Darwiche K, Goldberg E, Huang H, Simoff M, Li Q, Browning R, Freitag L, Turner JF, Pivert PL, **Yarmus L**, Zarogoulidis K, Brachmann J. Radiation Exposure of Patients by Cone Beam CT during Endobronchial Navigation - A Phantom Study. *J Cancer*. 2014 Feb 6;5(3):192-202.
  39. Pandian V, Miller CR, Schiavi AJ, **Yarmus L**, Contractor A, Haut ER, Feller-Kopman DJ, Mirski MA, Morad AH, Carey JP, Hillel AT, Maragos CS, Bhatti NI. Utilization of a standardized tracheostomy capping and decannulation protocol to improve patient safety. *Laryngoscope*. 2014 Aug;124(8):1794-800.
  40. Akulian J, Feller-Kopman D, Lee H, **Yarmus L**. Advances in interventional pulmonology. *Expert Rev Respir Med*. 2014 Apr;8(2):191-208.
  41. Zarogoulidis P, Kioumis I, Lampaki S, Organtzis J, Porpodis K, Spyrtos D, Pitsiou G, Petridis D, Pataka A, Huang H, Li Q, **Yarmus L**, Hohenforst-Schmidt W, Pezirkianidis N, Zarogoulidis K Optimization of nebulized delivery of linezolid, daptomycin, and vancomycin aerosol. *Drug Des Dev Ther*. 2014 August:8 Pages 1065-1072.
  42. Pandian V, Smith CP, Cole TK, Bhatti NI, Mirski MA, **Yarmus LB**, Feller-Kopman DJ. Optimizing Communication in Mechanically Ventilated Patients. *J Med Speech Lang Pathol*. 2014;21(4):309-318.
  43. Feller-Kopman D, **Yarmus L**. Interventional pulmonology. *Semin Respir Crit Care Med*. 2014. Dec;35(6):629-30.
  44. Lee HJ, Feller-Kopman D, Islam S, Majid A, **Yarmus L**. Analysis of Employment Data for Interventional Pulmonary Fellowship Graduates. *Ann Am Thorac Soc*. 2015 Apr;12(4):549-52.
  45. Gilbert C, Lee H, Maldonado F, Skalski H, Wahidi M, Choi P, Bessich J, Serman D, Argento A, Shojaee S, Gorden J, Wilshire C, Feller-Kopman D, Ortiz R, Nonyane B, **Yarmus, L**. The Use of Indwelling Tunneled Pleural Catheters for Recurrent Pleural Effusions in Patients with Hematologic Malignancies: A Multicenter Study. *Chest* 2015. Sep 1;148(3):752-758.
  46. Ost DE, Ernst A, Grosu HB, Lei X, Diaz-Mendoza J, Slade M, Gildea TR, Machuzak MS, Jimenez CA, Toth J, Kovitz KL, Ray C, Greenhill S, Casal RF, Almeida FA, Wahidi MM, Eapen GA, Feller-Kopman D, Morice RC, Benzaquen S, Tremblay A, Simoff M; **AQuIRE Bronchoscopy Registry**. Therapeutic bronchoscopy for malignant central airway obstruction: success rates and impact on dyspnea and quality of life. *Chest*. 2015 May; 147(5):1282-1298.
  47. Thomas R, Piccolo F, Miller D, MacEachern P, Chee, A, Husein, **Yarmus L**; Bhatnagar R, Lee HJ, Feller-Kopman D, Maskell N, Tremblay A, Lee YC. Intrapleural Fibrinolysis for the Treatment of Indwelling Pleural Catheter-Related Symptomatic Loculations – A Multi-Center Observational Study. *Chest* 2015. Sep 1;148(3):746-51.
  48. Ost D, Ernst A Grosu H, Lei X, Diaz-Mendoza J, Slade M, Gildea T, Machuzak M, Jimenez C, Toth J, Kovitz K, Ray C, Greenhill S, Casal R, Almeida F, Wahidi M, Eapen G, **Yarmus L**, Morice R, Benzaquen S, Simoff M. Complications Following Therapeutic Bronchoscopy for Malignant Central Airway Obstruction: Results of the AQuIRE Registry. *Chest* 2015. Aug 1;148(2):450-71.
  49. Gilbert, C; Lee, Hans; Feller-Kopman; **Yarmus, L**. A Quality Improvement Intervention to Reduce Indwelling Tunneled Pleural Catheter Pleural Infection Rates. *Ann Am Thorac Soc*. 2015. Jun;12(6):847-53. *\*Results led to international changes in the standard of care during tunneled pleural catheter placement\**
  50. Arias S, Lee H, Semaan R, Frimpong B, Ortiz R, Feller-Kopman D, Oakjones-Burgess K, **Yarmus L**. Use of Electromagnetic Navigational Transthoracic Needle Aspiration (E-TTNA) for Sampling of Lung Nodules. *J Vis Exp*. 2015 May 23;(99):e52723.

51. Shafiq M, Frick KD, Lee H, **Yarmus L**, Feller-Kopman DJ. Management of Malignant Pleural Effusion: A Cost-Utility Analysis. *J Bronchol Interv Pulmonol*. 2015 Jul;22(3):215-25.
52. Ost DE, Ernst A, Lei X, Kovitz KL, Benzaquen S, Diaz-Mendoza J, Greenhill S, Toth J, Feller-Kopman D, Puchalski J, Baram D, Karunakara R, Jimenez CA, Filner JJ, Morice RC, Eapen GA, Michaud GC, Estrada-Y-Martin RM, Rafeq S, Grosu HB, Ray C, Gilbert CR, **Yarmus L**, Simoff M. Diagnostic Yield and Complications of Bronchoscopy for Peripheral Lung Lesions: Results of the AQUIRE Registry. *Am J Respir Crit Care Med*. 2016 Jan 1;193(1):68-77.
53. **Yarmus L**, Akulian J, Ortiz R, Thompson R, Oakjones-Burgess K, Arias S, Semaan R, Feller-Kopman D, Lee H, Wang KP. A randomized controlled trial evaluating airway inspection effectiveness during endobronchial ultrasound bronchoscopy. *J Thorac Dis*. 2015 Oct;7(10):1825-32.
54. **Yarmus LB**, Semaan RW, Arias SA, Feller-Kopman D, Ortiz R, Bösmüller H, Illei PB, Frimpong BO, Oakjones-Burgess K, Lee HJ. A Randomized Controlled Trial of a Novel Sheath Cryoprobe for Bronchoscopic Lung Biopsy in a Porcine Model. *Chest*. 2016 Aug;150(2):329-36.  
\*First report and evaluation of a new invention of a minimally invasive device. Accompanying editorial published highlighting the potential impact of this novel approach\*
55. Gilbert CR, Casal RF, Lee HJ, Feller-Kopman D, Frimpong B, Dincer HE, Podgaetz E, Benzaquen S, Majid A, Folch E, Gorden JA, Chenna P, Chen A, Abouzgheib W, Sanny Nonyane BA, **Yarmus LB**. Use of One-Way Intrabronchial Valves in Air Leak Management After Tube Thoracostomy Drainage. *Ann Thorac Surg*. 2016 May;101(5):1891-6.
56. **Yarmus LB**, Arias S, Feller-Kopman D, Semaan R, Wang KP, Frimpong B, Oakjones Burgess K, Thompson R, Chen A, Ortiz R, Lee HJ. Electromagnetic navigation transthoracic needle aspiration for the diagnosis of pulmonary nodules: a safety and feasibility pilot study. *J Thorac Dis*. 2016 Jan;8(1):186-94.  
\*First in human report of a novel minimally invasive approach to lung cancer diagnostics\*
57. Semaan RW, Hazbon MP, Arias SA, Lerner AD, **Yarmus LB**, Feller-Kopman DJ, Lee HJ. Academic Productivity of Interventional Pulmonology Training Programs. *Ann Am Thorac Soc*. 2016 Apr;13(4):536-9
58. Krochmal R, Reddy C, **Yarmus L**, Desai NR, Feller-Kopman D, Lee HJ. Patient evaluation for rapid pleurodesis of malignant pleural effusions. *J Thorac Dis*. 2016 Sep;8(9):2538-2543.
59. Belanger AR, Nguyen K, Osman U, Gilbert CR, Allen K, Al Rais AF, **Yarmus L**, Akulian JA. Pleural effusions in non-transplanted cystic fibrosis patients. *J Cyst Fibros*. 2017 Jul;16(4):499-502.
60. Pandian V, Hutchinson CT, Schiavi AJ, Feller-Kopman DJ, Haut ER, Parsons NA, Lin JS, Gorbalkin C, Angamuthu PG, Miller CR, Mirski MA, Bhatti NI, **Yarmus LB**. Predicting the need for nonstandard tracheostomy tubes in critically ill patients. *J Crit Care*. 2017 Feb;37:173-178.
61. Semaan RW, Lee HJ, Feller-Kopman D, Lerner AD, Mallow CM, Thiboutot J, Arias SA, **Yarmus LB**. Same-Day Computed Tomographic Chest Imaging for Pulmonary Nodule Targeting with Electromagnetic Navigation Bronchoscopy May Decrease Unnecessary Procedures. *Ann Am Thorac Soc*. 2016 Dec;13(12):2223-2228.
62. Hohenforst-Schmidt W, Zarogoulidis P, Steinheimer M, Benhassen N, Tsiouda T, Baka S, **Yarmus L**, Stratakos G, Organtzis J, Pataka A, Tsakiridis K, Karapantzios I, Karapantzou C, Darwiche K, Zissimopoulos A, Pitsiou G, Zarogoulidis K, Man YG, Rittger H. Tyrosine Kinase Inhibitors for the Elderly. *J Cancer*. 2016 Mar 21;7(6):687-93.
63. O'Connell OJ, Almeida FA, Simoff MJ, **Yarmus L**, Lazarus R, Young B, Chen Y, Semaan R, Saettele TM, Cicensia J, Bedi H, Kliment C, Li L, Sethi S, Diaz-Mendoza J, Feller-Kopman D, Song J, Gildea T, Lee H, Grosu HB, Machuzak M, Rodriguez-Vial M, Eapen GA, Jimenez CA, Casal RF, Ost DE. A Prediction Model to Help with the Assessment of Adenopathy in Lung Cancer (HAL). *Am J Respir Crit Care Med*. 2017 Jun 15;(12):1651-1660.
64. Scholten EL, Semaan R, Illei P, Mallow C, Arias S, Feller-Kopman D, Oakjones-Burgess K, Frimpong B, Ortiz R, Lee H, **Yarmus L**. Stylet Usage Does Not Improve Diagnostic Outcomes in Endobronchial Ultrasound Transbronchial Needle Aspiration: A Randomized Clinical Trial. *Chest*. 2017 Mar;151(3):636-642.
65. Wahidi MM, Reddy C, **Yarmus L**, Feller-Kopman D, Musani A, Shepherd RW, Lee H, Bechara R, Lamb C, Shofer S, Mahmood K, Michaud G, Puchalski J, Rafeq S, Cattaneo SM, Mullon J, Leh S, Mayse M, Thomas SM, Peterson B, Light RW. Randomized Trial of Pleural Fluid Drainage Frequency in Patients with Malignant Pleural Effusions-The ASAP Trial. *Am J Respir Crit Care Med*. 2017 Apr 15;195(8):1050-1057.
66. Arias S, Liu QH, Frimpong B, Lee H, Feller-Kopman D, **Yarmus L**, Wang KP. Role of the Endobronchial Landmarks Guiding TBNA and EBUS-TBNA in Lung Cancer Staging. *Can Respir J*. 2016; 2016:1652178.

67. Lee HJ, Coleman B, Lerner AD, Feller-Kopman D, Semaan R, Frimpong B, **Yarmus L**. Procedural Learning Perspectives of Pulmonary Fellows and Practitioners. *J Bronchol Interv Pulmonol*. 2017 Jul;24(3):200-205
68. Zarogoulidis P, Huang H, Bai C, Petridis D, Papadopoulou S, Faniadou E, Eleftheriadou E, Trakada G, Cristoforos K, Rapti A, **Yarmus L**, Kopman DF, Man YG, Hohenforst-Schmidt W. Nab-paclitaxel as First Line Treatment for NSCLC in Elderly Patients More Than 75 Years Old. *J Cancer*. 2017 Jun 4;8(9):1673-78
69. Munoz ML, Lechtzin N, Li QK, Wang K, **Yarmus LB**, Lee HJ, Feller-Kopman DJ. Bronchoscopy with endobronchial ultrasound guided transbronchial needle aspiration vs. transthoracic needle aspiration in lung cancer diagnosis and staging. *J Thorac Dis*. 2017 Jul;9(7):2178-2185.
70. Yuan W, Brown R, Mitzner W, **Yarmus L**, Li X. Super-achromatic monolithic microprobe for ultrahigh-resolution endoscopic optical coherence tomography at 800 nm. *Nature Commun*. 2017 Nov 16;8(1):1531.
71. Lee HJ, Labaki W, Yu D, Salwen B, Gilbert C, Schneider A, Ortiz R, Feller-Kopman D, Arias S, **Yarmus L**. Airway stent complications: the role of follow-up bronchoscopy as a surveillance method. *J Thorac Dis* 2017 Dec;9(11):4651-4659.
72. Tsukada H, Entcheva-Dimitrov P, Ernst A, Rafeq S, Keating JH, Seward KP, **Yarmus L**. Pharmacokinetics and safety of paclitaxel delivery into porcine airway walls by a new endobronchial drug delivery catheter. *Respirology*. 2018 Apr;23(4):399-405.
73. Silvestri GA, Tanner NT, Kearney P, **Yarmus L**, Vachani A, Massion P, Porter A, Springmeyer SC, Fang KC, Midthun D, Mazzone PJ. Assessment of Plasma Proteomics Biomarker's Ability to Distinguish Benign From Malignant Lung Nodules: Results of the PANOPTIC (Pulmonary Nodule Plasma proteomics Classifier) trial. *Chest*. 2018 Sep;154(3):491-500.
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15. Arias S, Semaan R, Lee H, Molena D, Feller-Kopman D, **Yarmus L**. Tridimensional Medical Thoracoscopy. *Ann Am Thorac Soc*. 2015 Jun;12(6):945-7.
16. Gilbert CR, Abendroth C, **Yarmus LB**. The Intranodal Presence of Coexisting Granulomatous Inflammation and Carcinoma During Transbronchial Needle Aspiration of Intrathoracic Lymphadenopathy. *J Bronchol Interv Pulmonol*. 2017 Jan;24(1):80-83.
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18. Adkinson BC, Akkineni S, Villamizar NR, Donna EE, Yarmus LB, Arias SA. Computed Tomography during Bronchoscopic Lung Splinting for Atelectasis. *Ann Thorac Surg*. 2021 Jan 6:S0003-4975(21)00030-8.

#### Book Chapters [BC]

1. **Yarmus L**, Feller-Kopman D. New Bronchoscopic Instrumentation: A Review and Update in Rigid Bronchoscopy. In *Interventional Pulmonology*, Beamis J, Mathur P, Mehta A (eds). Informa Healthcare, New York. 2010
2. **Yarmus L**, Feller-Kopman D. Pulmonary Physiology, Pulmonary Function Tests and Bronchoscopic Techniques. In *Johns Hopkins Cardiothoracic Surgery*, Yuh D, Vricella L, Yang S (eds). McGraw Hill, New York, 2011
3. **Yarmus L**. Percutaneous Tracheostomy. In *Principles and Practice of Interventional Pulmonology*, Ernst A, Herth F (eds). Springer, Louisiana, 2011
4. Gilbert C, Akst L, **Yarmus L**. Diseases and Management of the Trachea. In *Otolaryngology*, McGraw Hill, New York. 2012
5. Gilbert C, **Yarmus L**. Interventional Pulmonology. In *Current Therapy in Thoracic and Cardiovascular Surgery*. Elsevier, New York. 2013
6. Arias S, **Yarmus L**. Endobronchial Ultrasound. In *Diagnostic Evaluation of the Respiratory System*. Jaypee Brothers, India, 2016
7. Batra H, **Yarmus L**. Pulmonary Physiology, Pulmonary Function Tests and Bronchoscopic Techniques. In *Johns Hopkins Cardiothoracic Surgery*, 3rd Ed. Yuh D, Vricella L, Yang S (eds). McGraw Hill, New York, 2018
8. Kapp C, Janssen J, Maldonado F, **Yarmus L**. Nonspecific Pleuritis. In *ERS Pleural Disease*, ERS publ, Sheffield, UK 2020 (in press)
9. **Yarmus L**, Feller-Kopman D. Interventional Pulmonary Medicine. In *Harrison's Principle of Internal Medicine 21<sup>st</sup> Ed*. McGraw Publ. 2020 (in press)

#### Books, Textbook [BK]

1. **Yarmus L**, Herth F (eds). In Principles and Practice of Interventional Pulmonology. Springer, Louisiana 2020 (in press)\**Regarded as the most authoritative textbook in interventional pulmonology\**

#### **Guidelines/Protocols, Consensus Statement, Expert Opinion, Consortium Articles [GL]**

1. Ernst A, Wahidi MM, Read CA, Buckley JD, Addrizzo-Harris DJ, Shah PL, Herth FJ, de Hoyos Parra A, Ornelas J, **Yarmus L**, Silvestri GA. Adult Bronchoscopy Training: Current State and Suggestions for the Future: CHEST Expert Panel Report. *Chest*. 2015. Aug 1;148(2):321-32.
2. McSparron JI, Michaud GC, Gordon PL, Channick CL, Wahidi MM, **Yarmus LB**, Feller-Kopman DJ, Makani SS, Koenig SJ, Mayo PH, Kovitz KL, Thomson CC; for the Skills-based Working Group of the Education Committee, American Thoracic Society. Simulation for Skills-based Education in Pulmonary and Critical Care Medicine. *Ann Am Thorac Soc*. 2015 Apr;12(4):579-86.
3. Wahidi MM, Herth F, Yasufuku K, Shepherd RW, **Yarmus L**, Chawla M, Lamb C, Casey KR, Patel S, Silvestri GA, Feller-Kopman DJ. Technical Aspects of Endobronchial Ultrasound Guided Transbronchial Needle Aspiration: CHEST Guideline and Expert Panel Report. *Chest*. 2015. Mar; 149(3):816-35.
4. Hetzel J, Maldonado F, Ravaglia C, Wells AU, Colby TV, Tomassetti S, Ryu JH, Fruchter O, Piciucchi S, Dubini A, Cavazza A, Chilosi M, Sverzellati N, Valeyre D, Leduc D, Walsh SLF, Gasparini S, Hetzel M, Hagemeyer L, Haentschel M, Eberhardt R, Darwiche K, **Yarmus LB**, Torrego A, Krishna G, Shah PL, Annema JT, Herth FJF, Poletti V. Transbronchial Cryobiopsies for the Diagnosis of Diffuse Parenchymal Lung Diseases: Expert Statement from the Cryobiopsy Working Group on Safety and Utility and a Call for Standardization of the Procedure. *Respiration*. 2018;95(3):188-200.
5. Crespo MM, McCarthy DP, Hopkins PM, Clark SC, Budev M, Bermudez CA, Benden C, Eghtesady P, Lease ED, Leard L, D'Cunha J, Wigfield CH, Cypel M, Diamond JM, Yun JJ, **Yarmus L**, Machuzak M, Klepetko W, Verleden G, Hoetzenecker K, Dellgren G, Mulligan M. ISHLT Consensus Statement on adult and pediatric airway complications after lung transplantation: Definitions, grading system, and therapeutics. *J Heart Lung Transplant*. 2018 May;37(5):548-563.
6. Maldonado F, Danoff SK, Wells AU, Colby TV, Ryu JH, Liberman M, Wahidi MM, Frazer L, Hetzel J, Rickman O, Herth FJF, Poletti V, **Yarmus L**. Transbronchial Cryobiopsy for the Diagnosis of Interstitial Lung Diseases: CHEST Guideline and Expert Panel Report. *Chest*. 2020 Apr;157(4):1030-1042. *\*First evidence-based guideline on technique and approach developed by Dr. Yarmus\**
7. Gilbert CR, Wahidi MM, **Yarmus LB**, Roy-Chowdhuri S, Pastis NJ. Key Highlights for the College of American Pathology Statement on Collection and Handling of Thoracic Small Biopsy and Cytology Specimens for Ancillary Studies. *Chest* 2020. Dec;158(6):2282-2284.
8. Roy-Chowdhuri S, Dacic S, Ghofrani M, Illei PB, Layfield LJ, Lee C, Michael CW, Miller RA, Mitchell JW, Nikolic B, Nowak JA, Pastis NJ Jr, Rauch CA, Sharma A, Souter L, Billman BL, Thomas NE, VanderLaan PA, Voss JS, Wahidi MM, **Yarmus LB**, Gilbert CR. Collection and Handling of Thoracic Small Biopsy and Cytology Specimens for Ancillary Studies: Guideline From the College of American Pathologists in Collaboration With the American College of Chest Physicians, Association for Molecular Pathology, American Society of Cytopathology, American Thoracic Society, Pulmonary Pathology Society, Papanicolaou Society of Cytopathology, Society of Interventional Radiology, and Society of Thoracic Radiology. *Arch Pathol Lab Med*. 2020 May 13. [Epub ahead of print]

#### **Editorials [ED]**

1. Wang KP, Feller-Kopman D, Mehta A, Sharma M, **Yarmus L**. Endobronchial ultrasound and esophageal ultrasound: just because we can, does not necessarily mean we should. *Chest*. 2011 Jul;140(1):271-2.
2. **Yarmus L**, Feller-Kopman D, Browning R, Wang KP. TBNA: should EBUS be used on all lymph node aspirations? *J Bronchology Interv Pulmonol*. 2011 Apr;18(2):115-7.
3. Gilbert CR, **Yarmus LB**, Feller-Kopman DJ, Lee HJ, Gordon JA. The Undefined Value of Pleural Interventions in Advanced Heart Failure and Recurrent Pleural Effusions. *Ann Am Thorac Soc*. 2016 Mar;13(3):447-8.
4. Akulian JA, **Yarmus L**. If they don't degrade can indwelling pleural catheters evolve? *Respirology*. 2016 Jul;21(5):787-8.
5. Semaan RW, Lerner AD, Lee HJ, Feller-Kopman D, **Yarmus LB**. Electromagnetic Guidance for the Diagnosis of Pulmonary Nodules: Don't Put the Nail in the Coffin. *Am J Respir Crit Care Med*. 2016 Jul 1;194(1):121.

6. Lerner AD, **Yarmus L**, Gorden JA, Gilbert CR. Intrabronchial valves for persistent air-leaks: what's the verdict?. *Expert Rev Respir Med*. 2016 Oct 3:1-3.
7. Maldonado F, Yarmus, L. Response to A Randomized Controlled Trial of a Novel Sheath Cryoprobe for Bronchoscopic Lung Biopsy in a Porcine Model. *Chest*. 2017 Feb;151(2):513-514.
8. Semaan R, **Yarmus L**. Reply: Same-Day Computed Tomographic Chest Imaging for Pulmonary Nodule Targeting with Electromagnetic Navigation Bronchoscopy: Will It Prevent Unnecessary Procedures? *Ann Am Thorac Soc*. 2017 Mar;14(3):479-480.
9. Bedawi EO, **Yarmus L**, Rahman NM. The ongoing struggle with empyema management: is surgery really the answer? *J Thorac Dis*. 2018 Nov;10(Suppl 33):S4122-S4125. doi: 10.21037/jtd.2018.10.54.
10. Akulian JA, **Yarmus L**. The Cold Truth About Cryobiopsy Readiness. *J Bronchology Interv Pulmonol*. 2019 Jan;26(1):4-5.
11. **Yarmus L**, Danoff S. COUNTERPOINT: Should Transbronchial Cryobiopsies Be Considered the Initial Biopsy of Choice in Patients With a Possible Interstitial Lung Disease? No. *Chest*. 2019 May;155(5):895-897.
12. Thiboutot J, **Yarmus LB**, Lee HJ, Rivera MP, Ost DE, Feller-Kopman D. Real-World Application of the NAVIGATE Trial. *J Thorac Oncol*. 2019 Jul;14(7):e146-e147.
13. Maldonado F, **Yarmus L**. Pragmatic Studies in Interventional Pulmonology: Two Steps Forward, One Step Back, but an Imminent Leap Forward. Introducing IPOG, the Interventional Pulmonary Outcome Group. *J Bronchology Interv Pulmonol*. 2019 Jul;26(3):150-152.
14. **Yarmus L**, Danoff S. Rebuttal From Drs **Yarmus** and Danoff. *Chest*. 2019 May;155(5):898-899.
15. Akulian JA, Maldonado F, **Yarmus L**. Do Not go Gentle Into the Ice. *J Bronchology Interv Pulmonol*. 2019 Oct;26(4):e45-e46.
16. Maldonado F, Wells A, Danoff S, Colby T, Ryu J, Poletti V, Rickman O, Herth F, Wahidi M, Hetzel J, Liberman M, **Yarmus L**. Before Freezing Out Cryobiopsy, We Need to Thaw Out Flaws in the Diagnosis of Interstitial Lung Disease. *Am J Respir Crit Care Med*. 2019 Oct 1;200(7):937-938.
17. Burks AC, Gould MK, Silvestri G, **Yarmus LB**, Sears CR, Arenberg DA, Gonzalez AV, Slatore CG, Tanner NT, Vachani A, Nana-Sinkam P, Fuster MM, Wahidi MM, Tanoue LT, Rivera MP. Safely and Effectively Evaluating Computed Tomography-detected Lung Lesions. Much Work to Be Done. *Ann Am Thorac Soc*. 2019 Nov;16(11):1360-1362.
18. Gilbert CR, Maldonado F, **Yarmus LB**, Akulian JA, Wilshire CL, Gorden JA. Life Is Really Simple, but We Insist on Making It Complicated-Lessons From Confucius on Ultrasound Use in the ICU. *Crit Care Med*. 2020 Jan;48(1):e81.
19. Lentz R, **Yarmus L**, Maldonado F, Response to Suction versus Gravity Thoracentesis, *Chest* 2020 Jul;158(1):424-425.
20. Silvestri GA, Beville B, Chen A, Pastis NJ, Rivera MP, Tanner NT, **Yarmus L**, Vachani A. Response. *Chest*. 2021 Jan;159(1):438-439.

#### Letters, Correspondence [LT]

1. **Yarmus L**. Mirski, M. Not all indications for tracheostomy are created equal. *Crit Care Med*, 2013 May;41(5):e58-9.
2. Lee HJ, **Yarmus L**. Response. *Chest*. 2014 Feb;145(2):425-6.
3. Gilbert C, Feller-Kopman D, **Yarmus L**. Response. *Chest*. 2014 Feb;145(2):422-3.
4. Gilbert CR, Lee HJ, Feller-Kopman D, **Yarmus LB**. The continuing search for the peripheral pulmonary nodule and virtual bronchoscopy. *Am J Respir Crit Care Med*. 2014 Feb 1;189(3):367-8.

#### Other Media [OM]

1. **Yarmus L**, Wahidi M, Finley D. Bronchoscopic Lung Volume Reduction. *ACCP Newsletter, Chest Physician*. 2012.
2. **Yarmus L**, Pneumothorax Pathophysiology and Management, BMJ Best Practice point of care electronic decision tool. 2019
3. **Yarmus L**, Building a Research Program in Interventional Pulmonology, American Association for Bronchology and Interventional Pulmonology webinar 2019

#### FUNDING

##### EXTRAMURAL FUNDING

##### Research Extramural Funding

##### Current

9/1/15-8/31/21	<p>Biomarker Levels during Indwelling Pleural Catheter Sample Testing  Rocket Medical  \$145,361  Role: PI: 1%</p>
9/1/15-8/31/20	<p>Concordance of EGFR Mutational Analysis between Blood and Tissue Biopsy for Metastatic NSCLC Patients  Sysmex Inostics, Inc.  \$128,488  PI: Feller-Kopman  Role: Co-Investigator: 1%</p>
6/1/16-6/1/21	<p>A Phase 3, Open-Label, Randomized, Parallel Group Study to Evaluate the Efficacy and Safety of Intrapleural Administration of Adenovirus-Delivered Interferon Alpha-2b (rADIFN) in Combination with Celecoxib and Gemcitabine in Patients with Malignant Pleural Mesothelioma  Infinite / Trizel  \$179,335  PI (Hopkins): Feller-Kopman  Role: Co-Investigator: 5%</p>
7/1/16-6/30/21	<p>Micro Coherence Imaging Technology for Assessing Obstructive Lung Disease in vivo  NIH R01HL121788-01A1  \$2,655,793  PI: Brown  Role: Co-Investigator: 10%</p>
6/30/17-5/31/21	<p>NanoSpectrometer Based Lung Cancer Biomarker Discovery and Confirmation Study  Nanobeak  \$273,056  Role: PI: 5%</p>
2/14/18-1/13/22	<p>Multicenter, Prospective Trial of Electromagnetic Bronchoscopic and Electromagnetic Transthoracic Approaches for the Biopsy of Peripheral Pulmonary Lesions (ALL IN ONE)  Veran Medical Technologies, Inc.  \$293,978  Role: PI: 10%</p>
3/1/18-2/28/21	<p>Neoadjuvant Nivolumab or Nivolumab in Combination with Ipilimumab in Resectable NSCLC  Stand Up 2 Cancer  \$43,545  PI (Hopkins): Feller-Kopman  Role: Co-Investigator (L Yarmus): 5%</p>
4/1/18-3/31/21	<p>The Impact of a Gravity versus Vacuum Based Indwelling Tunneled Pleural Drainage System on Pain: A Multicenter, Randomized Trial  Rocket Medical  \$320,895  Role: PI: 3%</p>
6/1/18-5/31/21	<p>Blood Sample Collection in Subjects with Pulmonary Nodules or CT Suspicion of Lung Cancer  Exact Sciences  \$184,836  Role: PI: 1%</p>

5/23/19-4/12/25	Evaluation of the Safety and Efficacy of TLD in Patients with COPD (AIRFLOW-3) Nuvaira, Inc. \$126,735 Role: PI: 5%
3/1/20-2/28/22	A Phase 2 randomized, placebo-controlled, double-blind, dose-ranging study evaluating LTI-01 (single-chain urokinase plasminogen activator, scuPA) in patients with infected, non-draining pleural effusions Lung Therapeutics, Inc. \$112,345 Role: PI: 1%
4/1/20-6/30/24	Safety of a Sheath Cryoprobe Bronchoscopic Transbronchial Biopsy Technique (The FROSTBITE Trial) ERBE USA, Incorporated \$91,933 Role: PI: 1%
4/1/20-3/31/24	A multicenter, randomized controlled trial, prospectively evaluating the clinical utility of the Nodify XL2 proteomic classifier in incidentally discovered low to moderate risk lung nodules Biodesix, Inc. \$74,060 Role: PI: 1%
5/1/20-6/30/22	SEER-Lung: A Prospective Blood Sample Collection Study to Develop and Validate a Panel of Protein-based Biomarkers in Patients with Pulmonary Nodules Seer, Inc. \$284,257 Role: PI: 1%
7/1/21-6/30/26	Liquid Biopsy of Solitary Pulmonary Nodule with Extracellular Vesicles NIH R01CA255948-01A1 Directs: \$1,879,110 PI: Wan Role: Co-Investigator: 15%
Previous	
10/1/07-7/31/09	A Randomized Prospective Trial of Rapid On Site Evaluation of Transbronchial Needle Aspirate Specimens Maine Medical Center Research Committee \$10,200 Role: PI: 1%
6/22/10-12/31/13	Randomized Trial of Pleural Fluid Drainage Frequency in Patients with Malignant Pleural Effusions. The ASAP Trial Duke University / CareFusion Inc. \$28,015 Role: PI: 1%
7/1/11-6/30/12	A Survey of Dedicated Interventional Pulmonology Fellowships in the United States American Association of Bronchology and Interventional Pulmonology \$3,000 Role: PI
1/1/12-12/31/17	Targeting inflammation in COPD Cureveda, Inc. \$32,061

Role: PI: 1%

2/1/13-7/10/13 Lung Volume Reduction Coil Treatment in Patients with Emphysema  
PneumRx, Inc  
\$292,632  
Role: PI: 1%

3/15/13-3/14/14 Airway Stenosis after Undergoing Lung Transplant (ASSAULT)  
American Association of Bronchology and Interventional Pulmonology  
\$10,000  
Role: PI: 1%

7/1/13-6/30/14 The Analysis of the EBUS scope as a Hybrid Bronchoscope  
Fuji Corporation  
\$65,000  
Role: PI 1%

7/1/13-6/30/17 Early diagnosis of pulmonary nodules using a plasma proteomic classifier  
Integrated Diagnostics  
\$126,254  
Role: PI: 5%

9/12/13-12/31/14 An Open-label Study to Evaluate Plasma and Pulmonary Pharmacokinetics Following  
Intravenous Administration of GSK2140944 in Healthy Adult Subjects  
Paraxel / Glaxo Smith Klein  
\$31,650  
Role: PI: 1%

1/1/14 – 6/30/14 MouthLab Optimization  
Maryland Innovation Initiative  
\$11,690  
PI: Gene Fridman  
Role: Co-Investigator

3/15/14-3/14/15 Treatment of Airway Stenosis after Undergoing Lung Transplant  
American Association of Bronchology and Interventional Pulmonology  
\$25,000  
Role: PI: 1%

7/1/14-6/30/17 Randomized Controlled Trial of EBUS Needles for Molecular Assessment  
Cook Medical  
\$68,320  
Role: PI: 1%

8/1/14-7/31/17 Broncho-adventitial Drug Delivery: Paclitaxel for Bronchial Carcinoma  
NIH/NCI 2R42CA141907-02  
\$138,156  
Role: PI: 10%; *\*First Interventional Pulmonary NIH grant ever awarded\**

12/17/14-3/16/19 A Multi-center, prospective, randomized trial of bronchoscopy with the ultrathin  
bronchoscope and radial Endobronchial ultrasound with fluoroscopy versus standard fiber  
optic bronchoscopy with fluoroscopy for biopsy of pulmonary function  
Medical University of South Carolina (sub-award)  
\$36,820.89  
PI: Silvestri  
Role: Co-Investigator: 5%



- 7/1/16-6/30/18 A Phase III Study Evaluating the Efficacy and Safety of Compared to Placebo and Midazolam in Patients Undergoing Bronchoscopy  
Paion, UK  
\$53,663  
Role: PI: 5%
- 8/1/16-7/31/14 Navigational bronchoscopy and transthoracic needle biopsy for the diagnosis of peripheral pulmonary nodules: A safety and feasibility study  
Veran Medical Technologies  
\$60,000  
Role: PI: 5%
- 12/1/16-12/31/18 A Pivotal Multi-Center, Randomized, Controlled, Single-Blinded Study Comparing the Silver Nitrate-Coated Indwelling Pleural Catheter (SNCIPC) to the Uncoated PleurX Catheter for the Management of Symptomatic, Recurrent, Malignant Pleural Effusions  
Becton, Dickenson & Company  
\$237,467  
PI (Hopkins): Feller-Kopman  
Role: Co-Investigator: 1%

### **Educational Extramural Funding**

#### **Current**

- 7/1/09-6/30/28 Multidisciplinary Training Program in Lung Diseases.  
NIH/NHLBI T32 HL07534  
\$6,431,304  
PI: Larissa Shimoda, PhD  
Role: Participating investigator

### **CLINICAL ACTIVITIES**

#### **Clinical Focus**

My clinical focus is strongly rooted in the field of Interventional Pulmonology where my clinical activities are centered on the diagnosis, staging and treatment of lung cancer. Our section is currently the most clinically and academically productive Interventional Pulmonology program in the country, and the first IP training program in the world to transition from a dedicated one-year fellowship program to a two-year program to ensure the academic success of our trainees. Because of our accomplishments, we were designated by the American College of Chest Physicians as a 'Center of Excellence' in 2012 and remain the only program in the country to be granted this designation. I serve as PI of multiple prospective multicenter clinical trials in the field and have authored and led multiple international guideline efforts in the field.

#### **Certification**

##### **Medical, other state/government licensure**

- 2009-present Maryland Medical License (#H0068282)  
2009-present Maryland Controlled Substances (#O66307)  
2009-present USDEA License (#BY9314915)

##### **Boards, other specialty certifications**

- 2006-2016 Diplomat in Internal Medicine, American Board of Internal Medicine  
2006-present Board Certified in Pulmonary Medicine, American Board of Internal Medicine  
2010-present Board Certified in Critical Care Medicine, American Board of Internal Medicine  
2014-present Board Certified in Interventional Pulmonology, American Association of Bronchology and Interventional Pulmonology  
2019-present Diplomat in Internal Medicine, National Board of Physicians and Surgeons  
2019-present Board Certified in Pulmonary Medicine, National Board of Physicians and Surgeons  
2019-present Board Certified in Critical Care Medicine, National Board of Physicians and Surgeons

### **Clinical (Service) Responsibilities**

- 2010-present Co-Director, Interventional Pulmonology, Attending Physician on the Interventional Pulmonology Service, Johns Hopkins Hospital (15%)
- 2010-present Critical Care Medicine, Attending in the Medical Intensive Care Unit, Critical Care Medicine, Johns Hopkins Hospital (5%)
- 2009-2011 Critical Care Medicine, Attending in the Cardiothoracic Intensive Care Unit (15%)
- 2013-present Director, Solitary Pulmonary Nodule Clinic (5%), Johns Hopkins Bayview (15%)
- 2013-present Attending, Inpatient Medicine Service, Janeway Firm Faculty (2%)
- 2014-present Director, Interventional Pulmonology, Attending Physician on the Interventional Pulmonology Service, Johns Hopkins Bayview (15%)

### **Clinical Program Building/Leadership**

- 2010-present Co-Director, Interventional Pulmonology, Johns Hopkins University School of Medicine  
Responsible for co-directing the program as a whole across the health system, including supervision of the dedicated clinical and research fellows, the research program and administrative needs of the section of Interventional. Because of our accomplishments, we were designated by the American College of Chest Physicians as a 'Center of Excellence' in 2012 and remains the only program in the country to be granted this designation.
- 2010-2015 Fellowship Program Director, Interventional Pulmonology, Johns Hopkins University School of Medicine - Responsible for creation of a formal IP training curriculum and the first to transition from a dedicated one-year fellowship program to a two-year program to ensure the academic success of our trainees and the Johns Hopkins Medicine tripartite mission. Our section is currently the most academically productive Interventional Pulmonology program in the country, and I am the PI of multiple prospective multicenter clinical trials in the field and have authored and led multiple international guideline efforts in the field.
- 2014-present Director, Interventional Pulmonology, Johns Hopkins Bayview- Tasked to direct and build an entirely new Interventional Pulmonary service on the Bayview campus. This effort required business plan creation, funding, capital equipment build and staffing efforts. Since its inception the program has grown annually and exceeded all clinical metric estimates.
- 2014-present Clinical Director, Division of Pulmonary and Critical Care, Johns Hopkins University School of Medicine- Responsible for direct clinical and operations oversight of over 100 faculty at Johns Hopkins Hospital, Johns Hopkins Bayview, Johns Hopkins Howard County and Johns Hopkins Sibley. During my tenure in this position I have created multiple new service lines within pulmonary and critical care throughout the health system resulting in improved clinical services, patient outcomes and revenue streams. The division's clinical budget has been profitable and continues to show incremental growth annually.

## **EDUCATIONAL ACTIVITIES**

### **Teaching**

#### **Classroom instruction**

- 1996-1997 Teaching Fellow, Department of Physics, Harvard University, Boston, MA
- 2012-present Instructor, Pulmonary Section, Second Year Medical School Curriculum, Genes-to-Society Course, Johns Hopkins University School of Medicine, Baltimore, MD

#### **Clinical Instruction**

- 2009-present Attending Physician, Interventional Pulmonary Consultation Service, 2 months/year, Johns Hopkins
- 2009-present Instructor, Intern procedural workshop, Johns Hopkins
- 2009-present Instructor, Pulmonary Fellows Introduction to Bronchoscopy, Johns Hopkins
- 2010-present Instructor. Anesthesia Critical Care Fellows Introduction to Bronchoscopy, Johns Hopkins
- 2013-present Teaching Attending, Osler Firm Faculty, Janeway Service
- 2015-present Core Teaching Faculty, Pulmonary and Critical Care Fellowship, Johns Hopkins
- 2016-present Housestaff Educator, Johns Hopkins School of Medicine

### **CME Instruction**

#### **JHMI/Regional**

2010 Lecturer, Malignant Pleural Effusions, Management of Pleural Disease: 100<sup>th</sup> Anniversary of Thoracoscopy, Johns Hopkins University School of Medicine, Baltimore

2011 Lecturer, Thoracic Ultrasound, Anesthesia Critical Care Ultrasound, Johns Hopkins University School of Medicine, Baltimore, MD

2011 Lecturer, Medical Thoracoscopy, 2<sup>nd</sup> Annual Management of Pleural Disease, Johns Hopkins University School of Medicine, Baltimore, MD

2012 Lecturer, Introduction to EBUS, EBUS and Advanced Diagnostic Bronchoscopy, Johns Hopkins University School of Medicine, Cambridge, MD

2012 Lecturer, Medical Thoracoscopy. 3<sup>rd</sup> Annual Diagnosis and Management of Pleural Disease, Johns Hopkins University School of Medicine, Baltimore, MD

2013 Lecturer, EBUS Anatomy, 2<sup>nd</sup> Annual EBUS and Advanced Diagnostic Bronchoscopy. Johns Hopkins University School of Medicine, Cambridge, MD

2013 Lecturer, Bronchoscopy in the ICU, 13<sup>th</sup> Annual Update and Board Review Pearls in Pulmonary and Critical Care Medicine, Johns Hopkins University School of Medicine, Cambridge, MD

2013 Lecturer, Percutaneous Tracheostomy Technique, Percutaneous Tracheostomy, Johns Hopkins University School of Medicine, Baltimore, MD

2014 Lecturer, Medical Thoracoscopy, 4<sup>th</sup> Annual Diagnosis and Management of Pleural Disease, Pulmonary CME Course, Johns Hopkins University School of Medicine, Baltimore, MD

2014 Lecturer, EBUS Anatomy, 3<sup>rd</sup> Annual EBUS and Advanced Diagnostic Bronchoscopy. Johns Hopkins University School of Medicine, Cambridge, MD

2015 Lecturer, Medical Thoracoscopy, 5<sup>th</sup> Annual Diagnosis and Management of Pleural Disease, Johns Hopkins University School of Medicine, Baltimore, MD

2015 Lecturer, EBUS Anatomy, 4<sup>th</sup> Annual EBUS and Advanced Diagnostic Bronchoscopy. Johns Hopkins University School of Medicine, Cambridge, MD

2016 Lecturer, Medical Thoracoscopy, 6<sup>th</sup> Annual Diagnosis and Management of Pleural Disease, Johns Hopkins University School of Medicine, Baltimore, MD

2016 Lecturer, EBUS Anatomy, 5<sup>th</sup> Annual EBUS and Advanced Diagnostic Bronchoscopy. Johns Hopkins University School of Medicine, Cambridge, MD

2017 Lecturer, Medical Thoracoscopy, 7<sup>th</sup> Annual Diagnosis and Management of Pleural Disease, Johns Hopkins University School of Medicine, Baltimore, MD

2017 Lecturer, EBUS Anatomy, 6<sup>th</sup> Annual EBUS and Advanced Diagnostic Bronchoscopy. Johns Hopkins University School of Medicine, Cambridge, MD

2018 Lecturer, Medical Thoracoscopy, 8<sup>th</sup> Annual Diagnosis and Management of Pleural Disease, Johns Hopkins University School of Medicine, Baltimore, MD

2018 Lecturer, EBUS Anatomy, 7<sup>th</sup> Annual EBUS and Advanced Diagnostic Bronchoscopy. Johns Hopkins University School of Medicine, Cambridge, MD

2019 Lecturer, Medical Thoracoscopy, 9<sup>th</sup> Annual Diagnosis and Management of Pleural Disease, Johns Hopkins University School of Medicine, Baltimore, MD

2019 Lecturer, EBUS Anatomy, 8<sup>th</sup> Annual EBUS and Advanced Diagnostic Bronchoscopy. Johns Hopkins University School of Medicine, Cambridge, MD

### **National**

2009 Lecturer, Bronchoscopy Year in Review, 12<sup>th</sup> Annual Update in Pulmonary and Critical Care Medicine, Johns Hopkins University School of Medicine, Bar Harbor, ME

2010 Lecturer, IP Training Experience, Interventional Pulmonology, Henry Ford Hospital, Detroit, MI

2011 Lecturer, Biopsy of the Lung, Pulmonary Nodules, Washington University in St Louis, St Louis. MO

2011 Lecturer, EBUS TBNA, American Thoracic Society, Denver, CO

2011 Lecturer, Pleural Ultrasound, Thoracic Ultrasound, Washington University in St Louis, St Louis. MO

2012 Lecturer, Pleural Manometry, American Thoracic Society, San Francisco, CA

2012 Lecturer, Electromagnetic Navigation, Pulmonary Nodules, Washington University in St Louis, St Louis. MO

2012 Lecturer, Pleural Ultrasound, Thoracic Ultrasound, Washington University in St Louis, St Louis. MO

2013 Lecturer, Biopsy of the Lung, Pulmonary Nodules, Washington University in St Louis, St Louis. MO

2013 Lecturer, Lung Transplant Airway Stenosis, American Thoracic Society, Philadelphia, PA

2013 Lecturer, Pleural Ultrasound, Thoracic Ultrasound, Washington University in St Louis, St Louis. MO

- 2014 Lecturer, Tissue Samples for Molecular Analysis, Lung Cancer Updates and Pearls. Johns Hopkins University School of Medicine, Chapel Hill, NC
- 2014 Lecturer, Interventional Pulmonary, 14<sup>th</sup> Annual Update and Board Review Pearls in Pulmonary and Critical Care Medicine, Johns Hopkins University School of Medicine, Sulphur Springs, WV
- 2014 Lecturer, A Multi-Disciplinary Approach to Lung Cancer, American Society of Clinical Pathology, Tampa, Florida.
- 2014 Lecturer, Pleural Updates, American Thoracic Society, San Diego, CA
- 2015 Lecturer, Biopsy of the Lung, Pulmonary Nodules, Washington University in St Louis, St Louis, MO
- 2015 Lecturer, Pleural Ultrasound, Thoracic Ultrasound, Washington University in St Louis, St
- 2015 Lecturer, Interventional Pulmonology, 15<sup>th</sup> Update and Board Review Pearls in Pulmonary and Critical Care Medicine, Johns Hopkins University School of Medicine, Isle of Palms, SC
- 2016 Lecturer, Tissue Samples for Molecular Analysis, 2<sup>nd</sup> Annual Lung Cancer Updates and Pearls. Johns Hopkins University School of Medicine, Chapel Hill, NC
- 2016 Lecturer, Interventional Pulmonology, 16<sup>th</sup> Update and Board Review Pearls in Pulmonary and Critical Care Medicine, Johns Hopkins University School of Medicine, Santa Fe, NM
- 2017 Lecturer, Tissue Samples for Molecular Analysis, 3<sup>rd</sup> Annual Lung Cancer Updates and Pearls. Johns Hopkins University School of Medicine, Chapel Hill, NC
- 2017 Lecturer, Advancement in Navigational Bronchoscopy, American Cancer Society, Las Vegas, NV
- 2017 Lecturer, Interventional Pulmonology, 17<sup>th</sup> Update and Board Review Pearls in Pulmonary and Critical Care Medicine, Johns Hopkins University School of Medicine, Napa Valley, CA
- 2018 Lecturer, Tissue Samples for Molecular Analysis, 4<sup>th</sup> Annual Lung Cancer Updates and Pearls. Johns Hopkins University School of Medicine, Chapel Hill, NC
- 2018 Lecturer, Cryobiopsy Guidelines, American College of Chest Physicians, San Diego, CA
- 2018 Lecturer, Navigational Bronchoscopy, Pittsburgh International Lung Conference, Pittsburgh, PA
- 2019 Lecturer, Tissue Samples for Molecular Analysis, 5<sup>th</sup> Annual Lung Cancer Updates and Pearls. Johns Hopkins University School of Medicine, Chapel Hill, NC
- 2019 Lecturer, Specimens and EBUS, American Thoracic Society, Dallas, TX
- 2019 Lecturer, Innovation in IP, National Innovation Summit, Dallas, TX
- 2019 Lecturer, Updates in Cryobiopsy, American College of Chest Physicians, San Antonio, TX
- 2020 Lecturer, Ciaglia Award Lecture: Interventional Pulmonary Outcomes Group, Chicago, IL

### **International**

- 2010 Lecturer, Basic Bronchoscopy, American College of Chest Physicians / American Association for Bronchology & Interventional Pulmonology, Vancouver, Canada
- 2012 Lecturer, Interventional in the USA, Asian Pacific Society of Respiriology, Shanghai, China
- 2013 Lecturer, Airway Stenosis, International Society for Heart and Lung Transplantation Annual Meeting, Montreal, Canada.
- 2014 Lecturer, EBUS Innovations, World Congress in Interventional Pulmonology, Kyoto, Japan.
- 2014 Lecturer, Updates in Thoracic Navigation, Chinese Respiratory Society, Shanghai, China
- 2015 Lecturer, Navigational Bronchoscopy, Korean Pulmonary Society, Juju, South Korea
- 2016 Lecturer, Navigational Bronchoscopy, Taiwan Pulmonary Society, Taipei, Taiwan
- 2017 Lecturer, Navigational Bronchoscopy, Malaysian Thoracic Society, Bangkok, Thailand
- 2018 Lecturer, Navigational Bronchoscopy, Taiwan Thoracic Society, Taipei, Taiwan
- 2019 Lecturer, Navigational Bronchoscopy, Japanese Thoracic Society, Tokyo, Japan

### **Workshops/seminars**

#### **National**

- 2010 Lecturer, EBUS Bronchoscopy Education, American College of Chest Physicians, Chicago, IL
- 2010 Lecturer, Difficult Airway, American College of Chest Physicians, Chicago, IL
- 2011 Lecturer, EBUS, American Thoracic Society, Denver, CO
- 2011 Lecturer, Pleural Disease, American Thoracic Society, Denver, CO
- 2012 Lecturer, GAIN NSCLC Regional Summit, American College of Chest Physicians, San Francisco CA
- 2013 Lecturer, Translational Science, American Association of Bronchology and Interventional Pulmonology, Denver, CO
- 2013 Lecturer, EMPOWER NSCLC Regional Summit, American College of Chest Physicians, Chicago, IL
- 2014 Lecturer, Advanced and Therapeutic Bronchoscopy Society of Thoracic Surgeons, NY, NY

2014 Lecturer, Lung Cancer, American Society of Clinical Pathology, Tampa, FL  
2015 Lecturer, EBUS, American Society of Clinical Pathology, Tampa, FL

#### International

2014 Lecturer, Interventional Pulmonary, Chinese Thoracic Society, Shanghai, China  
2015 Lecturer, Interventional Pulmonary, Korean Pulmonary Society, Jujju, South Korea  
2016 Lecturer, Interventional Pulmonary, Taiwan Pulmonary Society, Taipei, Taiwan  
2017 Lecturer, Interventional Pulmonary, Malaysian Thoracic Society, Bangkok, Thailand  
2018 Lecturer, Interventional Pulmonary, Taiwan Thoracic Society, Taipei, Taiwan  
2019 Lecturer, Interventional Pulmonary, Japanese Thoracic Society, Tokyo, Japan

#### Mentoring

##### Pre-doctoral Advisees /Mentees

2013-present Ricardo Ortiz, MS, Research Assistant Interventional Pulmonology, MD, Harvard University School of Medicine on full scholarship, Resident, Plastic Surgery, Massachusetts General Hospital, Boston, MA; OR 33, 35, 45, 49, 52, 53, 55, 63, 70, 101; CR 11  
2014-present David Hasemi, MS, Research Assistant Interventional Pulmonology, MD, University of Pennsylvania School of Medicine, Internal Medicine, Columbia University, NY  
2014-present Alphonso Robles, BA, Research Assistant Interventional Pulmonology, MD, University of Arizona School of Medicine, Med-Peds Residency, Mayo Clinic, Rochester, MN  
2015-2016 Julie Ng, MD, Research Assistant Interventional Pulmonology, Internal Medicine, Johns Hopkins University  
2016-2018 Ben Salwen, BA, Research Assistant Interventional Pulmonology, Medical Student, Sackler University School of Medicine, Tel Aviv, Israel; OR 70, 76, 82, 89, 97  
2017-2018 William Justice, BS, Research Assistant Interventional Pulmonology, Medical Student, Howard University School of Medicine  
2016-2020 Alexa Barriere, BA, Research Assistant Interventional Pulmonology, MPH, Johns Hopkins University Bloomberg School of Public Health; OR 76  
2018-2019 Anagha Sadasivan, BS, Research Assistant Interventional Pulmonology, Medical Student, University of Florida School of Medicine

##### Post-doctoral Advisees /Mentees - *\*indicates fellows graduating during my time as Fellowship Director*

2010-2011 Melhem Imad, MD\*, Interventional Pulmonology, Johns Hopkins University School of Medicine, Director of Interventional Pulmonary, East Virginia University Medical School, Norfolk, VA; OR 22, OR 24, CR 9  
2011-2012 Christopher Gilbert, DO\*, Interventional Pulmonology, Johns Hopkins University School of Medicine, Director of Interventional Pulmonary, Swedish Medical Center, Seattle, WA; OR 7, 10, 13, 15, 17, 21, 23, 24, 26, 31, 33, 35, 45, 48, 51, 54, 58, 70, 74, 76, 89, 94, 95, 97, 99; RA 7, 15; CR 7, 16; BC 4, 5; ED 3, 6, 18; LT 3, 4  
2012-2014 Jason Akulian, MD\*, Interventional Pulmonology, Johns Hopkins University School of Medicine, Director of Interventional Pulmonary, University of North Carolina, Chapel, NC; OR 10, 13, 14, 15, 17, 19, 23, 26, 30, 31, 33, 35, 40, 52, 58, 76, 80, 83, 85, 92, 94, 99; RA 20; CR 8, 10, 12; ED 4, 10, 15, 18  
2013-2014 Christina Argento, MD\*, Interventional Pulmonology, Duke University, Director of Interventional Pulmonary, Northwestern University, Chicago, IL; OR 26, 45, 74, 89, 97; RA 23  
2013-2017 Molly Hayes, MD\*, Director, MICU, Pulmonary and Critical Care Medicine, Director of MICU, Beth Israel Deaconess Hospital, Harvard University School of Medicine, Boston MA; OR 23, 73, 75; CR 1, 11  
2013-present Eric Scholten, MD\*, Internal Medicine, Johns Hopkins University School of Medicine, Pulmonary and Critical Care postdoctoral fellow, University of California San Diego; OR 63  
2013-present Sixto A. Arias, MD\*, Interventional Pulmonology, Johns Hopkins University School of Medicine, Director of Interventional Pulmonary, University of Miami School of Medicine, FL; OR 33, 49, 52, 53, 55, 56, 60, 63, 65, 70, 82, 101; RA 16, 23; CR 11, 13, 15; BC 6  
2013-present Roger Samuels, MD, MPH\*, Internal Medicine, Johns Hopkins University School of Medicine, Johns Hopkins University School of Medicine, Pulmonary and Critical Care postdoctoral fellow, Johns Hopkins University School of Medicine, Baltimore, MD

- 2014-present Sarina Sahetya, MD\*, Internal Medicine, Johns Hopkins University School of Medicine, Johns Hopkins University School of Medicine, Pulmonary and Critical Care postdoctoral fellow, Johns Hopkins University School of Medicine, Baltimore, MD; OR 15, OR 77
- 2014-present Roy Semaan, MD\*, Interventional Pulmonology, Johns Hopkins University School of Medicine Interventional Pulmonology, Director of Interventional Pulmonology, University of Pittsburgh, Pittsburgh, PA; OR 49, 52, 53, 55, 60, 62, 63, 66, 73, 75, 76, 82, 85; RA 21, 22; CR 15; ED 7, 8
- 2015-present Andrew Lerner, MD\*, Interventional Pulmonology, Johns Hopkins University School of Medicine, Director of Interventional Pulmonary, Sibley Hospital, Johns Hopkins University School of Medicine, Washington, DC; OR 56, 60, 66, 79, 81, 82, 84, 87, 89, 93, 97, 102; RA 27, 30; ED 5, 6
- 2016-present Diana Yu, MD\*, Interventional Pulmonology, Johns Hopkins University School of Medicine Interventional Pulmonology, Director of Interventional Pulmonology, Stanford University, Palo Alto, CA; OR 70, 89, 92, 100; BC 2, 7
- 2016-present Christopher Mallow, MD, Pulmonary and Critical, Johns Hopkins University School of Medicine, Pulmonary and Critical Care, University of Miami School of Medicine, Miami, FL; OR 60, 63, 73, 75, 76, 82, 83, 85, 89, 93, 95, 97, 100; RA 25
- 2017-present Majid Shafiq, MD, Interventional Pulmonology, Johns Hopkins University School of Medicine Interventional Pulmonology, Director of Interventional Pulmonology, Brigham and Women's Hosp, Harvard University School of Medicine, Boston, MA; OR 50, 87, 96, 100; RA 28, 31, CR 17
- 2017-present Jeffery Thiboutot, MD, Interventional Pulmonology, Johns Hopkins University School of Medicine Interventional Pulmonology, Interventional Pulmonology, Johns Hopkins University School of Medicine, Baltimore, MD; OR 60, 73, 76, 83, 89, 93, 97, 100; RA 30; ED 12; \*First IP fellow to receive an NIH F32. K08 pending\*
- 2018-present Sharad Chandrika, Interventional Pulmonology, Johns Hopkins University School of Medicine Interventional Pulmonology, Interventional Pulmonology, Cancer Treatment Centers of America, Phoenix, AZ; RA 33
- 2019-present Christopher Kapp, MD, Pulmonary and Critical, Johns Hopkins University School of Medicine, Interventional Pulmonology postdoctoral fellow, Johns Hopkins University School of Medicine, Baltimore, MD; BC 8

### **Thesis Committees**

- 2011-2012 Vinciya Pandian, PhD, Quality of Life in Mechanically Ventilated Patients, Johns Hopkins University School of Nursing, Baltimore, MD
- 2013-2019 Thesis Committee Member, The Whitaker Biomedical Engineering Institute, Johns Hopkins University, Baltimore, MD

### **Educational Program Building/Leadership**

- 2011-2015 Fellowship Program Director, Interventional Pulmonary, Division of Pulmonary and Critical Care, Johns Hopkins University School of Medicine, Baltimore, MD- Responsible for the training program as a whole including curriculum development, procedural and clinical competence and research mentorship. Created the first IP training program in the world to transition from a dedicated one-year fellowship program to a two-year program to ensure the academic success of our trainees and this Johns Hopkins Medicine tripartite mission. Our section is currently the most academically productive Interventional Pulmonology program in the country with 100% of graduates on faculty at academic centers.
- 2012-present Board of Directors, American Association for Bronchology and Interventional Pulmonology Exam Certification Committee. I am a founding member and exam writer of the American Association for Bronchology and Interventional Pulmonology's Board Certification Examination. This included working with a nationally recognized testing company to develop the outline for the examination, form a test writing committee, write the questions and administer the examination annually.
- 2019-present Co-Director, Economics of Clinical Operations Course, Office of Faculty Development, Johns Hopkins University School of Medicine, Baltimore, MD- To provide a basic, physician-oriented program with a goal of enhancing the understanding of business principles associated with healthcare financial and related regulatory environments.

## **RESEARCH ACTIVITIES**

### **Research Focus**

My research is focused on minimally invasive device design, prototyping, validation, safety and outcomes research to advance the minimally invasive diagnosis of lung cancer. I have concentrated my recent research and efforts to innovate and optimize tools to improve our diagnostic capabilities and have positioned my lab to work from bench to bedside. As part of this work, I invented a novel minimally invasive device at Johns Hopkins University to improve lung cancer diagnostics; utilized my business experience to partner with industry in the field to prototype and produce the device; ran several feasibility trials which resulted in FDA 510K approval in January 2020; and am the principal investigator of a randomized controlled multicenter trial to show efficacy and improvements over current methods.

### **Research Program Building/Leadership**

- 2012-present Founder and Director, Airway Stenosis After Undergoing Lung Transplantation network. Director of a multi-centered research network investigating airway stenosis after lung transplant pathophysiology and therapeutics.
- 2013-present Founder and Director, Interventional Pulmonary Outcomes Group (IPOG); the first multicentered research consortium within the Interventional Pulmonary community to organize and facilitate clinical and translational research focused on multicentered prospective trials. We have received a \$100,000 grant from a grateful patient to fund IPOG.
- 2013-2018 Director, Hopkins Lung Tissue (HOLT) Biorepository; a divisional multidisciplinary collaborative research-working group to organize and facilitate translational research through human specimens.
- 2013-present Director, Johns Hopkins Interventional Pulmonary Research Core. In this capacity, I am responsible for directing the translational, clinical and basic research projects efforts, overseeing the research lab team and building significant extramural funding since the creation of the core. From 2015 forward, Johns Hopkins Interventional Pulmonary Research Core remains one of the largest and most academically productive/funded IP programs in the world.

### **Research Demonstration Activities**

- 2015-present Association of Interventional Pulmonary Program Directors Research Mentorship Program, Curriculum based mentorship program to provide directed research mentorship to Interventional Pulmonary postdoctoral fellows in the US and Canadian.

### **Inventions, Patents, Copyrights**

- 8/1/13 Inventor, Encapsulated Cryoprobe for flexible bronchoscopic sampling of lung parenchyma  
Patent number 5038260b
- 1/6/20 FDA 510K Approval K190651, Encapsulated Cryoprobe
- 1/15/21 Inventor, Early stage lung cancer detection with volatile organic compound breath signatures  
Patent number pending

### **Technology Transfer Activities**

- 2018 Co-founder, Inspire Medical, LLC, a company that provides clinical research design, trial build, site selection, publication strategy and device expansion pathways to minimally invasive medical device corporations

## **SYSTEM INNOVATION AND QUALITY IMPROVEMENT ACTIVITIES**

### **System Innovation Focus**

Focus on improving lung nodule and lung cancer patient centered outcomes. I am the lead on projects generating a collaborative program to structure and improve the care of those patients both at JHMI and internationally. These programs include management of complex airways, tracheostomy, lung nodule management, pleural intervention management documentation and procedural safety.

### **System Innovation and Quality Improvement efforts within JHMI**

- 2010-present Co-Director, Multidisciplinary complex airway team, Initiated a multidisciplinary team and tumor board where active patients with complex airways are treated between the Interventional Pulmonology, Thoracic Surgery, Otorhinolaryngology Head & Neck Surgery and Anesthesiology services with a forum to discuss morbidity and mortality. The goal is continuous quality improvement for the care of these difficult patients.
- 2015-present Chair, Indwelling Pleural Catheter Safety Committee, Initiated quality assessment and improvement committee to develop improvement solutions to improve infection outcomes in patients with

- indwelling pleural catheters. Projects have resulted in evidence based institutional protocols which have improved patient outcomes.
- 2016-present Co-Chair, Pleural Infection and Thrombolysis Safety Committee, Develop institutional guidelines for the safe and effective administration of lytic therapy for pleural infection.
  - 2019-present Service Specific Liaison for Pulmonary and Critical Care Clinical Documentation Excellence (CDE) Program, works closely with CDE specialists to actively support and improve the process of clinical documentation in the inpatient medical record.
  - 2019-present Core Faculty, Johns Hopkins US News and World Report Marketing Committee
  - 2020-present Co-Director, COVID-19 Thoracic Oncology Triage Committee, Developed institutional guidelines and recommendations for thoracic oncology patient triage during the global pandemic.
  - 2020-present Clinical Director, COVID-19 ICU Taskforce, Modeled, designed and staffed 100 additional multidisciplinary ICU beds at Johns Hopkins Hospital to facilitate health system wide care capacity during the global pandemic. Required a multidisciplinary effort with the departments of medicine, anesthesia, surgery and pediatrics.

### **System Innovation and Quality Improvement efforts outside JHMI**

- 2013-present Founder and Director, Interventional Pulmonary Outcomes Group (IPOG): the first multicenter research consortium within the IP community with a mission to improve patient safety and quality improvement.
- 2016-present Co-Director, International Cryobiopsy Safety Consortium, Developed multidisciplinary guidelines and clinical trial development tools to advance procedural education and optimize safety during cryobiopsy procedures.
- 2018-present FDA Panel Member, Anesthesiology and Respiratory Therapy Devices Panel of the Medical Devices Advisory Committee, Food and Drug Administration

### **System Innovation and Quality Improvement/Leadership**

- 2010-present Co-Director, I have led the effort to create a multidisciplinary complex airway team, initiated a multidisciplinary team and tumor board where active patients with complex airways are treated between the Interventional Pulmonology, Thoracic Surgery, Otorhinolaryngology Head & Neck Surgery and Anesthesiology services with a forum to discuss morbidity and mortality. The goal is continuous quality improvement for the care of these difficult patients.
- 2015-present Chair, Indwelling Pleural Catheter Safety Committee, I have led the effort to create a quality assessment and improvement committee to develop improvement solutions to improve infection outcomes in patients with indwelling pleural catheters. Projects have resulted in evidence based institutional protocols which have improved patient outcomes.
- 2016-present Co-Chair, Pleural Infection and Thrombolysis Safety Committee, I have led the effort to develop institutional guidelines for the safe and effective administration of lytic therapy for pleural infection.
- 2020-present Co-Director, COVID-19 Thoracic Oncology Triage Committee, I led the effort to develop institutional and international guidelines and recommendations for thoracic oncology patient triage during the global pandemic.
- 2020-present Clinical Director, COVID-19 ICU Taskforce, Modeled, designed and staffed 100 additional multidisciplinary ICU beds at Johns Hopkins Hospital to facilitate health system wide care capacity during the global pandemic. Required a multidisciplinary effort with the departments of medicine, anesthesia, surgery and pediatrics.

## **ORGANIZATIONAL ACTIVITIES**

### **Institutional Administrative Appointments**

- 2010-present Co-Director, Interventional Pulmonology, Johns Hopkins Hospital
- 2010-Present Director, Interventional Pulmonology Fellowship Training Program
- 2010-present Procedural Complication Committee
- 2011-present Curriculum Development for Interventional Pulmonology Workshop
- 2013-present Director, Interventional Pulmonology, Johns Hopkins Bayview Medical Center
- 2013-present Director, Lung Nodule Clinic
- 2014-present Clinical Director, Division of Pulmonary and Critical Care Medicine
- 2017-present New Building Workgroup Committee, Johns Hopkins Bayview



2019-present Service Specific Liaison for Pulmonary and Critical Care Clinical Documentation Excellence (CDE) Program, works closely with CDE specialists to actively support and improve the process of clinical documentation in the inpatient medical record

### **Editorial Activities**

#### **Editorial Board Appointments**

2014-2017 Associate Editor, *Immunome Research*  
2015 Guest Editor, *Seminars in Respiratory and Critical Care Medicine: Interventional Pulmonology*  
2017-2019 Associate Editor, *BMC Pulmonary Medicine*  
2016-present Associate Editor, *Respirology*

#### **Journal Peer Review Activities**

2011-present *Chest: American College of Chest Physicians*  
2012-present *Journal of the American Medical Association*,  
2012-present *American Journal of Respiratory and Critical Care Medicine*  
2012-present *New England Journal of Medicine*  
2012-present *Respiration*  
2012-present *Respirology*  
2012-present *Journal of Bronchology and Interventional Pulmonology*  
2012-present *Journal of Hospital Medicine*  
2012-present *Respiratory Care*  
2012-present *Case Reports in Medicine*  
2012-present *American Journal of Medicine*  
2015-present *Thorax*  
2019-present *Lancet Respiratory Medicine*  
2019-present *Journal of Clinical Investigation*

#### **Advisory Committees, Review Groups/Study Sections**

2010-2015 National Chair, National Residency Matching Program (NRMP) for Interventional Pulmonology Fellowship Programs  
2011-2015 Executive Committee, American College of Chest Physicians (ACCP) Quality Improvement Registry (AQuIRE)  
2011-2015 Chair, NSCLC AQuIRE Data Element Workgroup  
2011-2015 Co-Chair, Thoracic Oncology Network E-Community committee  
2011-present Director, AIPPD Interventional Pulmonology Training and Curriculum Committee  
2011-2014 Co-Director, AABIP Interventional Pulmonology Board Certification Exploration Committee  
2012-present Member, AABIP Interventional Pulmonology Board Certification Exam Writing Committee  
2012-present Member, ACCP Interventional Pulmonary Network Steering Committee  
2013-present Member, Scientific Presentation and Awards Committee, American College of Chest Physicians  
2013-present Member, Clinical Advisory Committee, American Thoracic Society  
2014-present Member, Resident Development Scholarship Planning Committee, American Thoracic Society  
2014-present Executive Director, Research Committee, World Association of Bronchology and Interventional Pulmonology  
2015-2017 Vice-Chair, ACCP Interventional Pulmonary Network Steering Committee  
2017-2019 Chair, ACCP Interventional Pulmonary Network Steering Committee  
2018 Global Scientific Committee, 20<sup>th</sup> WCBIP/WCBE World Congress of Interventional Pulmonology  
2018-present Panel Member, Anesthesiology and Respiratory Therapy Devices Panel of the Medical Devices Advisory Committee, Food and Drug Administration  
2018-2020 Chair, American College of Chest Physicians Cryobiopsy for ILD Guidelines  
2019-present Study Section, Canada Foundation for Innovation  
2019 Advisory Board, Multidisciplinary Non-Small Cell Lung Cancer Diagnostics, NCCN  
2019-present Member, Program Committee, Thoracic Oncology Assembly, American Thoracic Society  
2019-present Member, Program Committee, Clinical Problems Assembly, American Thoracic Society  
2020-present Member, Nominating Committee, Thoracic Oncology Assembly, American Thoracic Society  
2020 Member, Lung Cancer Research Program Study Section, Department of Defense

## **Professional Societies**

2006-present American Thoracic Society  
2019-present Program Committee, Thoracic Oncology Assembly  
2019-present Program Committee, Clinical Problems Assembly  
2020-present Nominating Committee, Thoracic Oncology Assembly  
2006-present American College of Chest Physicians  
2015 -2017 Vice-Chair, ACCP Interventional Pulmonary Network  
2017-2019 Chair, ACCP Interventional Pulmonary Network  
2006-present American Association of Bronchoscopy and Interventional Pulmonology (AABIP)  
2011-present Director, AIPPD Interventional Pulmonology Training and Curriculum Committee  
2011-2014 Co-Director, AABIP Interventional Pulmonology Board Certification Exploration Committee  
2012-present Member, AABIP Interventional Pulmonology Board Certification Exam Writing Committee  
2006-2014 Society for Critical Care Medicine  
2009-present Founding Member, Association of Interventional Pulmonary Program Directors  
2013-present Founder, Interventional Pulmonary Outcomes Group  
2014-present Executive Director  
2019-present Study Section, Interventional Pulmonary Grants  
2014-present World Association of Bronchology and Interventional Pulmonology (WABIP)  
2014-present Executive Director, Research Committee, WABIP  
2014-present Fellow, American College of Chest Physicians  
2018-present Fellow, American Thoracic Society

## **Conference Organizer**

### **JHMI/Regional**

2010 Conference Organizer, The Management of Pleural Disease: 100<sup>th</sup> Anniversary of Thoracoscopy, Johns Hopkins University School of Medicine, Baltimore, MD  
2011 Conference Organizer, 2<sup>nd</sup> Annual Management of Pleural Disease, Johns Hopkins University School of Medicine, Baltimore, MD  
2012 Conference Organizer, EBUS and Advanced Diagnostic Bronchoscopy, Johns Hopkins University School of Medicine, Cambridge, MD  
2012 Conference Organizer, 3<sup>rd</sup> Annual Diagnosis and Management of Pleural Disease, Johns Hopkins University School of Medicine, Baltimore, MD  
2013 Conference Organizer, 2<sup>nd</sup> Annual EBUS and Advanced Diagnostic Bronchoscopy. Johns Hopkins University School of Medicine, Cambridge, MD  
2013 Conference Organizer, 13<sup>th</sup> Annual Update and Board Review Pearls in Pulmonary and Critical Care Medicine, Johns Hopkins University School of Medicine, Cambridge, MD  
2013 Conference Organizer, Percutaneous Tracheostomy, Johns Hopkins University School of Medicine, Baltimore, MD  
2014 Conference Organizer, 4<sup>th</sup> Annual Diagnosis and Management of Pleural Disease, Pulmonary CME Course, Johns Hopkins University School of Medicine, Baltimore, MD  
2014 Conference Organizer, 3<sup>rd</sup> Annual EBUS and Advanced Diagnostic Bronchoscopy. Johns Hopkins University School of Medicine, Cambridge, MD  
2015 Conference Organizer, 5<sup>th</sup> Annual Diagnosis and Management of Pleural Disease, Johns Hopkins University School of Medicine, Baltimore, MD  
2015 Conference Organizer, 4<sup>th</sup> Annual EBUS and Advanced Diagnostic Bronchoscopy. Johns Hopkins University School of Medicine, Cambridge, MD  
2016 Conference Organizer, 6<sup>th</sup> Annual Diagnosis and Management of Pleural Disease, Johns Hopkins University School of Medicine, Baltimore, MD  
2016 Conference Organizer, Percutaneous Tracheostomy, Johns Hopkins University School of Medicine, Baltimore, MD  
2016 Conference Organizer, 5<sup>th</sup> Annual EBUS and Advanced Diagnostic Bronchoscopy. Johns Hopkins University School of Medicine, Cambridge, MD  
2017 Conference Organizer, Percutaneous Tracheostomy, Johns Hopkins University School of Medicine, Baltimore, MD

- 2017 Conference Organizer, 7th Annual Diagnosis and Management of Pleural Disease, Johns Hopkins University School of Medicine, Baltimore, MD
- 2017 Conference Organizer, 6<sup>th</sup> Annual EBUS and Advanced Diagnostic Bronchoscopy. Johns Hopkins University School of Medicine, Cambridge, MD
- 2018 Conference Organizer, Percutaneous Tracheostomy, Johns Hopkins University School of Medicine, Baltimore, MD
- 2018 Conference Organizer, 8th Annual Diagnosis and Management of Pleural Disease, Johns Hopkins University School of Medicine, Baltimore, MD
- 2018 Conference Organizer, 7<sup>th</sup> Annual EBUS and Advanced Diagnostic Bronchoscopy. Johns Hopkins University School of Medicine, Cambridge, MD
- 2019 Conference Organizer, Percutaneous Tracheostomy, Johns Hopkins University School of Medicine, Baltimore, MD
- 2019 Conference Organizer, 9th Annual Diagnosis and Management of Pleural Disease, Johns Hopkins University School of Medicine, Baltimore, MD
- 2019 Conference Organizer, 8<sup>th</sup> Annual EBUS and Advanced Diagnostic Bronchoscopy. Johns Hopkins University School of Medicine, Cambridge, MD
- 2020 Conference Organizer, Percutaneous Tracheostomy, Johns Hopkins University School of Medicine, Baltimore, MD
- 2020 Conference Organizer, 10th Annual Diagnosis and Management of Pleural Disease, Johns Hopkins University School of Medicine, Baltimore, MD
- 2020 Conference Organizer, A COVID-19 Pandemic Update for Hospitals and Clinicians: A Virtual and Interactive Learning Experience, Johns Hopkins University School of Medicine, Baltimore, MD  
*\*Organized and directed the first global COVID-19 education effort during the pandemic in collaboration with Johns Hopkins International with proceeds directed towards institutional COVID-19 research and international humanitarian relief efforts\**

**National**

- 2014 Conference Organizer, Lung Cancer Updates and Pearls. Johns Hopkins University School of Medicine, Chapel Hill, NC
- 2014 Conference Organizer, 14<sup>th</sup> Annual Update and Board Review Pearls in Pulmonary and Critical Care Medicine, Johns Hopkins University School of Medicine, Sulphur Springs, WV
- 2015 Conference Organizer, 15th Update and Board Review Pearls in Pulmonary and Critical Care Medicine, Johns Hopkins University School of Medicine, Isle of Palms, SC
- 2016 Conference Organizer, 2<sup>nd</sup> Annual Lung Cancer Updates and Pearls. Johns Hopkins University School of Medicine, Chapel Hill, NC
- 2016 Conference Organizer, 16th Update and Board Review Pearls in Pulmonary and Critical Care Medicine, Johns Hopkins University School of Medicine, Santa Fe, NM
- 2017 Conference Organizer, 3<sup>rd</sup> Annual Lung Cancer Updates and Pearls. Johns Hopkins University School of Medicine, Chapel Hill, NC
- 2017 Conference Organizer, 17th Update and Board Review Pearls in Pulmonary and Critical Care Medicine, Johns Hopkins University School of Medicine, Napa Valley, CA
- 2018 Conference Organizer, 4th Annual Lung Cancer Updates and Pearls. Johns Hopkins University School of Medicine, Chapel Hill, NC
- 2019 Conference Organizer, 5th Annual Lung Cancer Updates and Pearls. Johns Hopkins University School of Medicine, Chapel Hill, NC

**Session Chair**

**JHMI/Regional**

- 2010 Session Chair, The Management of Pleural Disease: 100<sup>th</sup> Anniversary of Thoracoscopy, Johns Hopkins University School of Medicine, Baltimore, MD
- 2011 Session Chair, 2<sup>nd</sup> Annual Management of Pleural Disease, Johns Hopkins University School of Medicine, Baltimore, MD
- 2012 Session Chair, EBUS and Advanced Diagnostic Bronchoscopy, Johns Hopkins University School of Medicine, Cambridge, MD
- 2012 Session Chair, 3<sup>rd</sup> Annual Diagnosis and Management of Pleural Disease, Johns Hopkins University School of Medicine, Baltimore, MD

- 2013 Session Chair, 2<sup>nd</sup> Annual EBUS and Advanced Diagnostic Bronchoscopy. Johns Hopkins University School of Medicine, Cambridge, MD
- 2013 Session Chair, 13<sup>th</sup> Annual Update and Board Review Pearls in Pulmonary and Critical Care Medicine, Johns Hopkins University School of Medicine, Cambridge, MD
- 2013 Session Chair, Percutaneous Tracheostomy, Johns Hopkins University School of Medicine, Baltimore, MD
- 2014 Session Chair, 4<sup>th</sup> Annual Diagnosis and Management of Pleural Disease, Pulmonary CME Course, Johns Hopkins University School of Medicine, Baltimore, MD
- 2014 Session Chair, 3<sup>rd</sup> Annual EBUS and Advanced Diagnostic Bronchoscopy. Johns Hopkins University School of Medicine, Cambridge, MD
- 2015 Session Chair, 5<sup>th</sup> Annual Diagnosis and Management of Pleural Disease, Johns Hopkins University School of Medicine, Baltimore, MD
- 2015 Session Chair, 4<sup>th</sup> Annual EBUS and Advanced Diagnostic Bronchoscopy. Johns Hopkins University School of Medicine, Cambridge, MD
- 2016 Session Chair, 6<sup>th</sup> Annual Diagnosis and Management of Pleural Disease, Johns Hopkins University School of Medicine, Baltimore, MD
- 2016 Session Chair, Percutaneous Tracheostomy, Johns Hopkins University School of Medicine, Baltimore, MD
- 2016 Session Chair, 5<sup>th</sup> Annual EBUS and Advanced Diagnostic Bronchoscopy. Johns Hopkins University School of Medicine, Cambridge, MD
- 2016 Session Chair, 3<sup>rd</sup> International Tracheostomy Symposium, Baltimore, MD
- 2017 Session Chair, Percutaneous Tracheostomy, Johns Hopkins University School of Medicine, Baltimore, MD
- 2017 Session Chair, 7<sup>th</sup> Annual Diagnosis and Management of Pleural Disease, Johns Hopkins University School of Medicine, Baltimore, MD
- 2017 Session Chair, 6<sup>th</sup> Annual EBUS and Advanced Diagnostic Bronchoscopy. Johns Hopkins University School of Medicine, Cambridge, MD
- 2018 Session Chair, Percutaneous Tracheostomy, Johns Hopkins University School of Medicine, Baltimore, MD
- 2018 Session Chair, 8<sup>th</sup> Annual Diagnosis and Management of Pleural Disease, Johns Hopkins University School of Medicine, Baltimore, MD
- 2018 Session Chair, Invasive Pulmonary Fungal Disease, American College of Chest Physicians, Baltimore, MD
- 2018 Session Chair, 7<sup>th</sup> Annual EBUS and Advanced Diagnostic Bronchoscopy. Johns Hopkins University School of Medicine, Cambridge, MD
- 2019 Session Chair, Percutaneous Tracheostomy, Johns Hopkins University School of Medicine, Baltimore, MD
- 2019 Session Chair, 9<sup>th</sup> Annual Diagnosis and Management of Pleural Disease, Johns Hopkins University School of Medicine, Baltimore, MD
- 2019 Session Chair, 8<sup>th</sup> Annual EBUS and Advanced Diagnostic Bronchoscopy. Johns Hopkins University School of Medicine, Cambridge, MD
- 2020 Session Chair, Percutaneous Tracheostomy, Johns Hopkins University School of Medicine, Baltimore, MD
- 2020 Session Chair, 10<sup>th</sup> Annual Diagnosis and Management of Pleural Disease, Johns Hopkins University School of Medicine, Baltimore, MD

**National**

- 2013 Session Chair, Lung Transplant Airway Stenosis, American Thoracic Society, Philadelphia, PA
- 2014 Session Chair, Lung Cancer Updates and Pearls. Johns Hopkins University School of Medicine, Chapel Hill, NC
- 2014 Session Chair, 14<sup>th</sup> Annual Update and Board Review Pearls in Pulmonary and Critical Care Medicine, Johns Hopkins University School of Medicine, Sulphur Springs, WV
- 2014 Session Chair, A Multi-Disciplinary Approach to Lung Cancer, American Society of Clinical Pathology, Tampa, Florida.
- 2014 Session Chair, Pleural Updates, American Thoracic Society, San Diego, CA

- 2015 Session Chair, Thoracic Navigational Bronchoscopy Conference, St Louis, MO
- 2015 Session Chair, 15th Update and Board Review Pearls in Pulmonary and Critical Care Medicine, Johns Hopkins University School of Medicine, Isle of Palms, SC
- 2015 Session Chair, Lung Cancer Staging: Improving your yield, American Thoracic Society, Dallas TX
- 2015 Session Chair, Translational Aspects of Interventional Pulmonology, American College of Chest Physicians, San Diego, CA
- 2015 Session Chair, Building a Research Program, Association for Bronchology Interventional Pulmonary Fellow's Boot Camp, Orlando, FL
- 2015 Session Chair, Master Pleural Disease Expert Panel, American College of Chest Physicians, San Diego, CA
- 2015 Session Chair, Multidisciplinary Aspects of Lung Cancer Diagnostics, American College of Chest Physicians, San Diego, CA
- 2016 Session Chair, Building a Research Program, Association for Bronchology Interventional Pulmonary Fellow's Boot Camp, Orlando, FL
- 2016 Session Chair, 2<sup>nd</sup> Annual Lung Cancer Updates and Pearls. Johns Hopkins University School of Medicine, Chapel Hill, NC
- 2016 Session Chair, 16th Update and Board Review Pearls in Pulmonary and Critical Care Medicine, Johns Hopkins University School of Medicine, Santa Fe, NM
- 2016 Session Chair, Thoracic Navigational Bronchoscopy Conference, Las Vegas, NV
- 2017 Session Chair, Building a Research Program, Association for Bronchology Interventional Pulmonary Fellow's Boot Camp, Orlando, FL
- 2017 Session Chair, Lung Cancer Procedures, American Cancer Society, Las Vegas, Nevada.
- 2017 Session Chair, 18th World congress for Bronchology and Interventional Pulmonology, Rochester MN
- 2017 Session Chair, 3<sup>rd</sup> Annual Lung Cancer Updates and Pearls. Johns Hopkins University School of Medicine, Chapel Hill, NC
- 2017 Session Chair, 17th Update and Board Review Pearls in Pulmonary and Critical Care Medicine, Johns Hopkins University School of Medicine, Napa Valley, CA
- 2018 Session Chair, 4th Annual Lung Cancer Updates and Pearls. Johns Hopkins University School of Medicine, Chapel Hill, NC
- 2018 Session Chair, Cryobiopsy Guidelines, American College of Chest Physicians, San Diego, CA
- 2018 Session Chair, Building a Research Program, Association for Bronchology Interventional Pulmonary Fellow's Boot Camp, Orlando, FL
- 2018 Session Chair, Interventional Pulmonary, Pittsburgh International Lung Conference, Pittsburgh, PA
- 2019 Session Chair, Thoracic Navigational Bronchoscopy Conference, Las Vegas, NV
- 2019 Session Chair, Innovation in IP, National Innovation Summit, Dallas, TX
- 2019 Session Chair, Updates in Cryobiopsy, American College of Chest Physicians, San Antonio, TX
- 2019 Session Chair, Building a Research Program, Association for Bronchology Interventional Pulmonary Fellow's Boot Camp, Orlando, FL
- 2019 Session Chair, 5th Annual Lung Cancer Updates and Pearls. Johns Hopkins University School of Medicine, Chapel Hill, NC

**International**

- 2012 Session Chair, Interventional in the USA, Asian Pacific Society of Respiriology, Shanghai, China
- 2013 Session Chair, Airway Stenosis, International Society for Heart and Lung Transplantation Annual Meeting, Montreal, Canada.
- 2014 Session Chair, EBUS, World Congress in Interventional Pulmonology, Kyoto, Japan.
- 2014 Session Chair, Interventional Pulmonary, Chinese Respiratory Society, Shanghai, China.
- 2016 Session Chair, Research and Bronchoscopy, 19th World Congress of Bronchology and Interventional Pulmonology, Florence, Italy
- 2020 Session Chair, Cryobiopsy, 21<sup>st</sup> World Congress of Bronchology and Interventional Pulmonology, Shanghai, China
- 2020 Session Chair, EBUS or Conventional TBNA? 21<sup>st</sup> World Congress of Bronchology and Interventional Pulmonology, Shanghai, China

## Consultantships

2012-present	Olympus America
2013-present	Veran Medical
2015-present	Boston Scientific
2015-present	Rocket Medical
2016-present	Veracyte
2018-present	Astra Zeneca
2018-present	Intuitive Surgical

## RECOGNITION

### Awards and Honors:

2009	American Thoracic Society Critical Care training program travel scholarship
2009	Fellow, American College of Chest Physicians
2010	Young Clinical Investigators Award, American Association of Bronchology and Interventional Pulmonology
2011	Best Poster, American College of Chest Physicians Winner
2012	American College of Chest Physicians Johns Hopkins Interventional Pulmonology Program elected as <i>First IP Center of Excellence</i> , Atlanta, Georgia
2013	American Association of Bronchology and Interventional Pulmonology Awarded the first AABIP Research award
2017	Distinguished CHEST Educator Award, American College of Chest Physicians (inaugural class)
2018	Fellow, American Thoracic Society (inaugural class)
2018	Lung Cancer Screening Center of Excellence, Lung Cancer Alliance
2018	Distinguished CHEST Educator Award, American College of Chest Physicians
2019	Distinguished CHEST Educator Award, American College of Chest Physicians
2020	Distinguished CHEST Educator Award, American College of Chest Physicians
2020	Pasquale Ciaglia Memorial Lecture in Interventional Medicine, American College Chest Physicians
2021	Distinguished CHEST Educator Award, American College of Chest Physicians

### Invited Talks, Panels

#### JHMI/Regional

2009	Speaker, "Percutaneous Tracheostomy," Introduction to Tracheostomy, Department of Otolaryngology, Johns Hopkins University, Baltimore, MD
2009	Speaker, "Introduction to Interventional Pulmonology," Weinberg Oncology Unit, Johns Hopkins Hospital, Baltimore, MD
2009	Speaker, "Introduction to Interventional Pulmonology," Weinberg Oncology Unit, Johns Hopkins Hospital, Baltimore, MD
2009	Speaker, "Introduction to Thoracentesis and Thoracic Ultrasound," Johns Hopkins Procedure Workshop, Baltimore, MD
2009	Speaker, "TBNA: Improving the Yield," Introduction to Bronchoscopy Course, Johns Hopkins, Baltimore, MD
2009	Speaker, "Mitomycin and other adjuncts for airway stenosis," Multidisciplinary Airway Conference, Johns Hopkins, Baltimore, MD
2010	Speaker, "Central Airway Obstruction," Pulmonary Grand Rounds, Johns Hopkins University, Baltimore, MD
2010	Speaker, "Bronchoscopy: Myths, Legends and Artifacts," Pulmonary Grand Rounds, Johns Hopkins, Baltimore, MD
2010	Speaker, "Interventional Pulmonology in 2010," Medical Grand Rounds, Suburban Hospital, Bethesda, Maryland
2011	Speaker, "Interventional Pulmonology for the Cardiothoracic Surgeon," Cardiothoracic Surgery Grand Rounds, Johns Hopkins Hospital, Baltimore, MD
2011	Speaker, "Basic Bronchoscopy," Introduction to Bronchoscopy Course, Johns Hopkins Hospital, Baltimore, MD

- 2011 Speaker, "Thoracic ultrasound," Critical Care Ultrasonography, Johns Hopkins Hospital, Baltimore
- 2012 Speaker, "The Death of Pleural Nihilism," Medical Grand Rounds, Johns Hopkins Hospital, Baltimore, MD
- National**
- 2006 Speaker, "Instituting the FACTT Algorithm in your ICU," Pulmonary Grand Rounds, Maine Medical Center, Portland, ME
- 2007 Speaker, "Cardiac Sarcoidosis," Northern New England Fellows Conference, University of Vermont, Burlington, VT
- 2007 Speaker, "Cryptococcal Pneumonia in the Immunocompetent Host," Northern New England Fellows Conference, University of Vermont College of Medicine, Burlington, VT
- 2007 Speaker, "Endobronchial Ultrasound," Pulmonary Grand Rounds, Maine Med Center, Portland ME
- 2008 Speaker, "Pleural Manometry: Technique and Applications," Pulmonary Grand Rounds, Maine Medical Center, Portland, ME
- 2011 Speaker, "Interventional Pulmonology Update," Medical Grand Rounds, Prince Georges Hospital, Annapolis, Maryland
- 2011 Speaker, "Pleural Palliation," American Thoracic Society International Conference, San Diego, CA
- 2011 Speaker, "EBUS Molecular Analysis," American Thoracic Soc International Conf, San Diego, CA
- 2011 Speaker, "The Utility of Medical Thoracoscopy in a Patient with a Difficult Airway," CHEST 2011: American College of Chest Physicians, Honolulu, HI *\*winner, best case report, pleural disease*
- 2012 Speaker, "Tissue is the Issue Acquisition and Specimen Processing," American Thoracic Society International Conference, San Francisco, CA
- 2012 Speaker, "Lung Transplant and Bronchoscopy," American College of Chest Physicians Fundamentals of Bronchoscopy, Chicago, IL
- 2012 Speaker, "Bronchoscopy in the ICU," American Association of Bronchology and Interventional Pulmonology annual meeting, Cleveland, OH
- 2013 Speaker, "Bronchoscopic Lung Volume Reduction," American Thoracic Society International Meeting, Philadelphia, PA
- 2014 Speaker, "Radial EBUS," Society of Thoracic Surgeons annual meeting, Orlando, FL
- 2014 Speaker, EBUS specimen acquisition, Duke University, Durham, NC
- 2014 Speaker, "Specimen Acquisition and Processing," American Thoracic Society International Conference, San Diego
- 2014 Speaker, "BLVR," American College of Chest Physicians International Conference, Austin, TX
- 2015 Speaker, "Getting to the Periphery of the Lung," Washington University of Saint Louis, St Louis, MO
- 2015 Speaker, "Improving your EBUS Yield," Duke University, Durham, NC
- 2015 Speaker, "EBUS Outcomes," American Thoracic Society International Conference, Denver, CO
- 2016 Speaker, How Not to Die Short of Breath: Treatment of Malignant Pleural Effusions, American Thoracic Society International Conference, San Francisco, CA
- 2016 Speaker, Pleural Disease Master Class: Interactive Case-Based Studies, American College of Chest Physicians, Los Angeles, CA
- 2017 Speaker, "Where to biopsy the lung," American Thoracic Society International Conference, Washington, DC
- 2017 Speaker, "Advancements in Electromagnetic Guidance for the Diagnosis of Pulmonary Nodules," Brigham and Women's Hospital, Harvard University School of Medicine, Boston, MA
- 2018 Speaker, "The Future of Bronchoscopy and Lung Cancer," Tufts University Maine Medical Center, Portland ME
- 2018 Speaker, "Gaining Access to the Periphery of the Lung: Multi-Modality Approach," World Congress of Bronchology and Interventional Pulmonology, Rochester, MN, USA
- 2018 Speaker, "Research Advancements in IP": The Last Ten Years, American Association for Bronchology and Interventional Pulmonology Inaugural Conference, Denver, CO
- 2018 Speaker, "Updates in Navigation," American College of Chest Physicians International Conference, San Antonio, Tx
- 2019 Speaker, "Robotic Bronchoscopy," American Thoracic Society International Conference, Dallas, TX
- 2019 Speaker, "PRECISION-1 Trial and Robotics," American College of Chest Physicians International Conference, New Orleans, LA

- 2019 Speaker, “EMN and Radial EBUS,” American College of Chest Physicians International Conference, New Orleans, LA
- 2019 Speaker, “Pleural Masterclass,” American College of Chest Physicians International Conference, New Orleans, LA
- 2019 Speaker, “Endobronchial Ultrasound,” University of Pittsburgh International Lung Conference, Pittsburgh, PA
- 2019 Speaker, “Current Lung Cancer Molecular Tissue Acquisition Standards,” ACCP Lung Cancer Summit, Chicago, IL
- 2019 Speaker, “Lung Nodule Study Design,” Cleveland Clinic Advancing Early Stage Lung Cancer Detection Conference, Cleveland, OH
- 2019 Speaker, “Research Mentorship and Leadership Skills,” AIPPD Fellows Career Symposium, Orlando, FL

**International**

- 2010 Speaker, “IP Training Evolution,” CHEST 2010: American College of Chest Physicians, Vancouver, BC, Canada
- 2011 Speaker, “Airway Complication after Lung Transplant,” European Respiratory Society, Amsterdam, The Netherlands
- 2012 Speaker, “Cryobiopsy for Lung Transplant Surveillance,” International Society of Heart and Lung Transplantation, Prague, Czech Republic
- 2012 Speaker, “Pediatric Interventional Pulmonology,” 5<sup>th</sup> Conference of the Pediatric Bronchoscope Medicine Alliance and Pediatric Bronchoscopy Forum, Jinan, China
- 2012 Speaker, “EBUS-TBNA” 4<sup>th</sup> International Bronchoscopy Summit, Guangdong, China
- 2013 Speaker, “Palliative Interventional Therapies,” 4<sup>th</sup> International Symposium on Brain Death, Havana, Cuba
- 2014 Speaker, “EBUS,” Panhellenic Congress on Respiratory and Occupational Chest Diseases, Thessaloniki University Hospital, Thessaloniki, Greece
- 2014 Speaker, “A Novel Hybrid EBUS System.” World Congress of Interventional Pulmonology, Kyoto, Japan.
- 2015 Speaker, “Electromagnetic Guided Transthoracic Needle Aspiration,” European Interventional Pulmonology Society, Barcelona, Spain
- 2015 Speaker, “Electromagnetic Guided Transthoracic Needle Aspiration,” Taiwan Society of Pulmonary and Critical Care, Taipei, Taiwan
- 2015 Speaker, “Advances in Navigational Bronchoscopy,” Congress of the Asian Pacific Society of Respiriology, Kuala Lumpur, Malaysia
- 2016 Speaker, “Electromagnetic Guidance TTNA,” Asian Society for Cardiovascular and Thoracic Surgery, Taipei, Taiwan
- 2016 Speaker, “Novel Innovations in Bronchoscopy,” World Congress for the Association for Bronchology and Interventional Pulmonology, Florence, Italy
- 2017 Speaker, “Interventional Pulmonology,” Shanghai Respiratory Society, Shanghai, China
- 2017 Speaker, “Navigational Bronchoscopy in Lung Cancer,” Azienda Ospedaliera University, Ancona, Italy
- 2017 Speaker, “Cryobiopsy,” Association of Italian Pulmonologists, Ravenna, Italy
- 2018 Speaker, Transthoracic Navigation Guidance, Korean Society of Thoracic Surgery Annual Meeting, Jeju, Korea.
- 2018 Speaker, “Cryobiopsy for Interstitial Lung Disease,” European Respiratory Society Congress, Paris, France
- 2018 Speaker, “Innovation and Outcome Improvements in Lung Biopsy,” Asian Pacific Society of Respiriology, Taipei, Taiwan
- 2018 Speaker, “Cryobiopsy for ILD,” Association of Italian Pulmonologists, Ravenna, Italy
- 2018 Speaker, “Lung Cancer Staging and the Impact of EBUS,” The First Affiliated Hospital, Soochow University, Shanghai, China
- 2018 Speaker, Cryobiopsy for ILD,” Association of Italian Pulmonologists, Florence, Italy
- 2018 Speaker, “Research and Bronchoscopy” Chinese Medical Association Respiratory Branch, Wenzhou, China



- 2019 Speaker, “Development of a Novel Cryobiopsy Device” University of Tübingen, Tübingen, Germany
- 2019 Speaker, “Advancements in Robotic Bronchoscopy” World Association for Bronchology and Interventional Pulmonology, Madrid, Spain
- 2019 Speaker, “Clinical Trial Design and Cryobiopsy” University of Stuttgart, Stuttgart, Germany
- 2020 Speaker, “Lung Cancer Diagnosis: New Horizons” 36<sup>th</sup> Congress of Pneumology of the Portuguese Respiratory Society, Albufeira, Algarve, Portugal
- 2021 Speaker, “Incorporating Staging and Diagnosis as a Single Paradigm” American Thoracic Society Annual Meeting, Virtual Meeting due to COVID-19 Pandemic

**Visiting Professorships**

- 2011 Soochow University, Suzhou, China
- 2012 Second Military Medical University, Changzheng Hospital, Shanghai, China
- 2012 Shunde University, First People's Hospital of Shunde, Guangdong, China
- 2012 The Second Hospital of Shandong University, Jinan, China
- 2013 Xiamen China Second Military Medical University, Shanghai, China
- 2013 Medical University of South Carolina, Charleston, SC.
- 2013 Wenzhou Medical University, Wenzhou, China
- 2014 Jinan Pediatric Hospital, Jinan, China
- 2014 Mt Sinai Hospital, NY, NY
- 2016 Shanghai Tenth Peoples Hospital of Tonghii University, Shanghai, China
- 2017 Mahidol University, Siriraj Hospital, Bangkok, Thailand
- 2017 National Taiwan University Hospital, Taipei, Taiwan
- 2018 Stonybrook University School of Medicine, Stonybrook, NY
- 2018 The First Affiliated Hospital, Soochow University, Shanghai, China