Christine B. Peterson, PhD

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Current Position

Associate Professor (with tenure) Department of Biostatistics The University of Texas MD Anderson Cancer Center	2022 - present
Additional affiliations **Adjunct Professor** Department of Statistics Rice University	2018 - present
Program faculty Quantitative Sciences, The University of Texas MD Anderson Cancer Center UTHealth Houston Graduate School of Biomedical Sciences	2016 - present

Education

PhD, Statistics Rice University Advisor: Marina Vannucci	2009 - 2013
AB, Applied Mathematics Harvard University	2001 - 2005

Professional Experience

Assistant Professor Department of Biostatistics The University of Texas MD Anderson Cancer Center	2016 - 2022
Postdoctoral Scholar Biomedical Data Science, Advisor: Chiara Sabatti Stanford University	2014 - 2016
Graduate research assistant Rice University	2010 - 2013
Software Design Engineer Microsoft	2005 - 2009

Grants

Extensive track record of funding, consistently $> 80\%$ salary on external grants

Active grants

NIH/NHLBI R01 HL158796
New data science approaches to visualize and understand the impact of the microbiome on risk of graft-versus-host disease
Role: PI, 4/1/2022 - 2/28/2026

NSF DIVISION OF MATHEMATICAL SCIENCES (DMS) 2113602/2113557
Collaborative research: covariate-driven approaches to network estimation
Role: co-PI, 8/15/2021 - 7/31/2024

NIH/NCI R01 CA244845
Bayesian network-based integrative genomics methods for precision medicine
Role: co-I, 2/1/2021 - 1/31/2025

NIH/NHLBI R01 HL124112
Protecting colonic mucus to mitigate acute intestinal graft-versus-host disease
Role: co-I, 8/15/2015 - 6/30/2025

DEPARTMENT OF DEFENSE (DOD) KC200150
Targeting the DNA damage repair network to promote an innate immune response in ccRCC
Role: co-I, 9/15/2021-9/14/2024

MARK FOUNDATION FOR CANCER RESEARCH
An international, multicenter study to investigate and validate microbiome configurations and effectors in CD19-targeted CAR-T cell efficacy and toxicity
Role: co-I, 2/1/2022-1/31/2025

CANCER PREVENTION & RESEARCH INSTITUTE OF TEXAS (CPRIT) RP200395
Artificial intelligence for the peer review of radiation therapy treatments
Role: co-I, 3/1/2020 - 2/29/2024

VARIAN MEDICAL SYSTEM FOUNDATION
SIV-Varian strategic alliance project: networked plan QA & review platform
Role: co-I, 5/11/2020 - 10/6/2024

NIH/NCI R01 CA280980
Leveraging hyperpolarized MRI for precision oncology approaches in head and neck cancer
Role: co-I, 9/1/2022 - 8/31/2027

NIH/NCI R21 CA273984
Hypoglossal neuropathy in the pathogenesis of radiation associated dysphagia (hRAD)
Role: co-I, 4/1/2023 - 3/31/2025

NIH/NIDCR R01 DE032521
Development of miR-27a* for the treatment of head and neck squamous cell carcinoma
Role: co-I, 7/1/2023 - 6/30/2028

CONQUER CANCER FOUNDATION
Targeting the replication stress response to induce anti-cancer immunity in advanced solid malignancies
Role: co-I, 7/1/2020-12/31/2023

COMPLETED PI OR CO-PI GRANTS

CANCER PREVENTION & RESEARCH INSTITUTE OF TEXAS (CPRIT) RP150521
Pathogenesis and early progression of lung cancer
Role: co-PI of Biostatistics and Computational Biology Core, 12/1/2018 - 5/31/2022

NSF Division of Mathematical Sciences (DMS) 1811568/1811445
Collaborative research: Bayesian network estimation across multiple sample groups and data types
Role: co-PI, 8/15/2018 - 7/31/2021

Publications

Underlining denotes trainee supervised or co-supervised

Peer reviewed

Statistical methodology

1. **Peterson CB**, Saha S, Do K. (2024) Analysis of microbiome data. *Annual Review of Statistics and Its Application.* **11**. [pdf]

2. Das P, **Peterson CB**, Ni Y, Reuben A, Zhang J, Zhang J, Do K, Baladandayuthapani V. (2023) Bayesian hierarchical quantile regression with application to characterizing the immune architecture of lung cancer. *Biometrics.* **79**(3): 2474–2488 [pdf] [code]

3. Shoemaker K, Ger R, Court LE, Aerts H, Vannucci M, **Peterson CB**. (2023) Bayesian feature selection for radiomics using reliability metrics. *Frontiers in Genetics.* 14. Research Topic: Methods for Imaging and Omics Data Science. [pdf] [code]

4. Shi Y, Zhang L, Do K, Jenq RR, **Peterson CB**. (2023) Sparse tree-based clustering of microbiome data to characterize microbiome heterogeneity in pancreatic cancer. *Journal of the Royal Statistical Society Series C: Applied Statistics.* **72**(1): 20–36. [pdf] [code]

5. Wooten ZT, Yu C, Court LE, **Peterson CB**. (2023) Predictive modeling using shape statistics for interpretable and robust quality assurance of automated contours in radiation treatment planning. *Pacific Symposium on Biocomputing 2023.* 28: 395–406. [pdf] [code]

6. Qi X, Zhou S, Wang Y, **Peterson CB**. (2022) Bayesian sparse modeling to identify high-risk subgroups in meta-analysis of safety data. *Research Synthesis Methods.* **13**(6): 807–820. [pdf] [code]

7. Das P, De D, Maiti R, Kamal M, Hutcheson KA, Fuller CD, Chakraborty B, **Peterson CB**. (2022) Estimating the optimal linear combination of predictors using spherically constrained optimization. *BMC Bioinformatics.* **23**(3): 436. [pdf] [code]

8. Osborne N, **Peterson CB**, Vannucci M. (2022) Latent network estimation and variable selection for compositional data via variational EM. *Journal of Computational and Graphical Statistics.* **31**(1): 163-175. [pdf] [code]

9. Zhang L, Shi Y, Do K, **Peterson CB**†, and Jenq RR†. (2021) ProgPerm: Progressive permutation for a dynamic representation of the robustness of microbiome discoveries. *BMC Bioinformatics.* **22**: 1–21. †Co-senior authors. [pdf] [code] [Shiny app]

10. Bogomolov M*, **Peterson CB***, Benjamini Y, Sabatti C. (2021) Hypotheses on a tree: new error rates and testing strategies. *Biometrika.* **108**(3): 575–590. *Authors contributed equally. [pdf] [R package]

11. Zhang L, Shi Y, Jenq RR, Do K, **Peterson CB**. (2021) Bayesian compositional regression with structured priors for microbiome feature selection. *Biometrics.* **77**(3): 824-838. [pdf] [code]

12. Ha MJ, Kim J, Galloway-Peña J, Do KA, **Peterson CB**. (2020) Compositional zero-inflated network estimation for microbiome data. *BMC Bioinformatics.* **21**:1–20. [pdf] [code]

13. Shi Y, Zhang L, Do K, **Peterson CB**†, Jenq R†. (2020) aPCoA: covariate adjusted principal coordinates analysis. *Bioinformatics.* **36**(13): 4099–4101. †Co-senior authors. [pdf] [R package] [Shiny app]

14. **Peterson CB**, Osborne N, Stingo FC, Bourgeat P, Doecke JD, Vannucci M. (2020) Bayesian modeling of multiple structural connectivity networks during the progression of Alzheimer's disease. *Biometrics.* **76**(4): 1120–1132. [pdf] [code]

15. Das P, **Peterson CB**, Do K, Akbani R, Baladandayuthapani V. (2020) NExUS: Bayesian simultaneous network estimation across unequal sample sizes. *Bioinformatics.* **36**(3): 798–804. [pdf] [code]

16. SHADDOX E, **PETERSON CB**, STINGO FC, HANANIA N, CRUICKSHANK-QUINN C, KECHRIS K, BOWLER R, VANNUCCI M. (2020) Bayesian inference of networks across multiple sample groups and data types. *Biostatistics.* **21**(3): 561–576. [pdf] [code]

17. KIM J, DO K, HA MJ, **PETERSON CB**. (2019) Bayesian inference of hub nodes across multiple networks. *Biometrics.* **75**(1): 172–182. [pdf] [code]

18. CREMASCHI A, ARGIENTO R, SHOEMAKER K, **PETERSON CB**, VANNUCCI M. (2019) Hierarchical normalized completely random measures for robust graphical modeling. *Bayesian Analysis.* **14**(4): 1271–1301. [pdf]

19. SHADDOX E, STINGO F, **PETERSON CB**, JACOBSON S, CRUICKSHANK-QUINN C, KECHRIS K, BOWLER R, VANNUCCI M. (2018) A Bayesian approach for learning gene networks underlying disease severity in COPD. *Statistics in Biosciences.* **10**(1): 59–85. [pdf] [code]

20. BRZYSKI D, **PETERSON CB**, SOBCZYK P, CANDÉS EJ, BOGDAN M, SABATTI C. (2017) Controlling the rate of GWAS false discoveries. *Genetics.* **205**(1): 61–75. [pdf]

21. **PETERSON CB**, BOGOMOLOV M, BENJAMINI Y, SABATTI C. (2016) TreeQTL: hierarchical error control for eQTL findings. *Bioinformatics.* **32**(16): 2556-2558. [pdf] [R package]

22. **PETERSON CB**, BOGOMOLOV M, BENJAMINI Y, SABATTI C. (2016) Many phenotypes without many false discoveries: Error controlling strategies for multi-trait association studies. *Genetic Epidemiology.* **40**(1): 45–56. [pdf]

23. **PETERSON CB**, STINGO FC, VANNUCCI M. (2016) Joint Bayesian variable and graph selection for regression models with network-structured predictors. *Statistics in Medicine.* **35**(7): 1017–1031. [pdf] [code]

24. **PETERSON CB**, STINGO FC, VANNUCCI, M. (2015) Bayesian inference of multiple Gaussian graphical models. *Journal of the American Statistical Association.* **110**(509): 159–174.[pdf] [code]

25. **PETERSON CB**, VANNUCCI M, KARAKAS C, CHOI W, MA L, MALETIĆ-SAVATIĆ M. (2013) Inferring metabolic networks using the Bayesian adaptive graphical lasso with informative priors. *Statistics and Its Interface.* **6**(4): 547–558. [pdf]

26. ALLEN GI, **PETERSON CB**, VANNUCCI M, AND MALETIĆ-SAVATIĆ, M. (2013) Regularized partial least squares with an application to NMR spectroscopy. *Statistical Analysis and Data Mining.* **6**(4): 302–314. [pdf]

Statistical applications and collaborations: Microbiome research

27. ZHANG L, SAN VALENTIN EM, JOHN TM, JENQ RR, DO K, HANNA EY, **PETERSON CB**[†], REYES-GIBBY CC[†]. Influence of oral microbiome on longitudinal patterns of oral mucositis severity in patients with squamous cell carcinoma of the head and neck. *Cancer.* [†]Co-corresponding authors.

28. WITT RG, CASS SH, TRAN T, DAMANIA A, NELSON EE, . . ., **PETERSON CB**, ET AL. (2023) Gut microbiome in patients with early-stage and late-stage melanoma. **59**(10): 1076–1084.

29. BUTTON JE, COSETTA CM, REENS AL, BROOKER SL, ROWAN-NASH AD, . . ., **PETERSON CB**, KOH AY, RECHTMAN DJ, JENQ RR, MCKENZIE GJ. (2023) Precision modulation of dysbiotic adult microbiomes with a human-milk-derived synbiotic reshapes gut microbial composition and metabolites. *Cell Host & Microbe.* **31**(9): 1523–1538.

30. FRANCISCO DM, ZHANG L, JIANG Y, OLVERA A, ADACHI J, GUEVARA EY, AITKEN SL, GAREY KW, **PETERSON CB**, ET AL. (2023) Risk factors associated with severe *Clostridioides difficile* infection in patients with cancer. *Infectious Diseases and Therapy.* **12**(1): 209–225.

31. SCHWABKEY Z, WIESNOSKI DH, CHANG C, TSAI W, PHAM D, . . ., **PETERSON CB**, DO KA, ZHANG L, SHI Y, . . ., JENQ RR. (2022) Diet-derived metabolites and mucus link the gut microbiome to fever after cytotoxic cancer treatment. *Science Translational Medicine.* **14**(671): eabo3445.

32. Schmiester M, Maier R, Riedel R, Durek P, Frentsch M, Kolling S, Mashreghi MF, Jenq R, Zhang L, **Peterson CB**, Bullinger L, Chang H, Na I. (2022) Flow cytometry can reliably capture gut microbial composition in healthy adults as well as dysbiosis dynamics in patients with aggressive B-cell non-Hodgkin lymphoma. *Gut Microbes.* **14**(1): 2081475.

33. Franklin S, Aitken SL, Shi Y, Sahasrabhojane PV, Robinson S, **Peterson CB**, et al. (2022) Oral and stool microbiome coalescence and its association with antibiotic exposure in acute leukemia patients. *Frontiers in Cellular and Infection Microbiology.* **12**: 848580.

34. Shi Y, Zhang L, **Peterson CB**†, Do K†, Jenq RR†. (2022) Performance determinants of unsupervised clustering methods for microbiome data. *Microbiome.* **10**(25): 1–12. †Authors contributed equally.

35. Spencer CN, McQuade JL, Gopalakrishnan V, McCulloch JA, Vetizou M, Cogdill AP, Khan MA, Zhang X, White MG, **Peterson CB**, Wong MC, et al. (2021) Dietary fiber and probiotics influence the gut microbiome and melanoma immunotherapy response. *Science.* **374**(6575): 1632–1640.

36. Hajjar J, Mendoza T, Zhang L, Fu S, Piha-Paul SA, Hong DS, Janku F, Karp DD, Ballhausen A, Gong J, Zarifa A, **Peterson CB**, et al. (2021) Associations between the gut microbiome and fatigue in cancer patients. *Scientific Reports.* **11**: 5847.

37. Reyes-Gibby CC, Wang J, Zhang L, **Peterson CB**, Do KA, et al. (2020) Oral microbiome and onset of oral mucositis in patients with squamous cell carcinoma of the head and neck. *Cancer.* **126**(23): 5124–5136.

38. Robinson S, **Peterson CB**, Sahasrabhojane P, Ajami NJ, Shelburne SA, Kontoyiannis DP, Galloway-Peña JR. (2020) Observational cohort study of oral mycobiome and interkingdom interactions over the course of induction therapy for leukemia. *mSphere.* **5**(2): e00048-20.

39. Galloway-Peña JR, Shi Y, **Peterson CB**, Sahasrabhojane PV, Gopalakrishnan V, Brumlow CE, et al. (2020) Gut microbiome signatures are predictive of infectious risk following induction therapy for acute myeloid leukemia. *Clinical Infectious Diseases.* **71**(1): 63–71.

40. Riquelme E, Zhang Y, Zhang L, Maria M, Michelle Z, Dong W, …, **Peterson CB**, et al. (2019) Tumor microbiome diversity and composition influence pancreatic cancer outcomes. *Cell.* **178**(4): 795–806.e12.

41. Galloway-Peña JR, **Peterson CB**, Malik F, Sahasrabhojane PV, Shah DP, Brumlow CE, et al. (2019) Fecal microbiome, metabolites, and stem cell transplant outcomes: a single-center pilot study. *Open Forum Infectious Diseases.*

42. Jiang Z, Jenq RR, Ajami NJ, Petrosino JF, Alexander AA, Ke S, Iqbal T, DuPont AW, Muldrew K, Shi Y, **Peterson CB**, Do K, DuPont HL. (2018) Safety and preliminary efficacy of orally administered lyophilized fecal microbiota product compared with frozen product given by enema for recurrent clostridium difficile infection: a randomized clinical trial. *PLoS ONE.* **13**(11): e0205064.

Statistical applications and collaborations: Medical physics

43. He Y, Cazoulat G, Wu C, Svensson S, Almodovar-Abreu L, Rigaud B, McCollum E, **Peterson CB**, Wooten ZT, et al. (2023) Quantifying the effect of 4-dimensional computed tomography–based deformable dose accumulation on representing radiation damage for patients with locally advanced non-small cell lung cancer treated with standard-fractionated intensity-modulated radiation therapy. *International Journal of Radiation Oncology*Biology*Physics.*

44. Ryosuke T, Cortes AC, Zaske AM, Williams M, Dupuis C, Tanaka T, Nishiofuku H, Chintalapani G, **Peterson CB**, Avritscher R. (2023) Liver cancer vascularity driven by extracellular matrix stiffness: implications for imaging research. **58**(12): 894–902.

45. AHMAD M, SUN P, **PETERSON CB**, ANDERSON MR, LIU X, MORANI AC, JENSEN CT. (2023) Low pitch significantly reduces helical artifacts in abdominal CT. *European Journal of Radiology.* **166**: 110977.

46. GRONBERG MP, JHINGRAN A, NETHERTON TJ, GAY SS, CARDENAS CE, …, **PETERSON CB**, VAZQUEZ I, WHITAKER TJ, WOOTEN ZT, YANG M, COURT LE. (2023) Deep learning–based dose prediction to improve the plan quality of volumetric modulated arc therapy for gynecologic cancers. *Medical Physics.* **50**(11): 6639–6648.

47. GLENN MC, BROOKS F, **PETERSON CB**, HOWELL RM, FOLLOWILL DS. ET AL. (2022) Photon beam modeling variations predict errors in IMRT dosimetry audits. *Radiotherapy and Oncology.* **166**: 8–14.

48. MCCULLOCH M, CAZOULAT G, SVENSSON S, GRYSHKEVYCH S, RIGAUD B, ANDERSON B, …, **PETERSON CB**, BALTER P, KOAY EJ, BROCK KK. (2022) Leveraging deep learning-based segmentation and contours-driven deformable registration for dose accumulation in abdominal structures. *Frontiers in Oncology.* **12**: 1015608.

49. OWENS CA, RIGAUD B, LUDMIR EB, GUPTA AC, SHRESTHA S, PAULINO AC, SMITH SA, **PETERSON CB**, ET AL. (2022) Development and validation of a population-based anatomical colorectal model for radiation dosimetry in late effects studies of survivors of childhood cancer. *Radiotherapy and Oncology.* **176**: 118–126.

50. NETHERTON T, NGUYEN C, CARDENAS CE, CHUNG C, KLOPP AH, COLBERT LE, RHEE DJ, **PETERSON CB**, HOWELL R, BALTER P, COURT LE. (2022) An automated treatment planning framework for spinal radiotherapy and vertebral level second check. *International Journal of Radiation Oncology*Biology*Physics.* **114**(3): 516–528.

51. HARTZELL S, GUAN F, TAYLOR P, **PETERSON CB**, TADDEI P, KRY S. (2021) Uncertainty in tissue equivalent proportional counter assessments of microdosimetry and RBE estimates in carbon radiotherapy. *Physics in Medicine & Biology.* **66**(15): 155018.

52. HE Y, CAZOULAT G, WU C, **PETERSON CB**, MCCULLOCH M, ANDERSON B, POLLARD?LARKIN J, BALTER P, LIAO Z, MOHAN R, BROCK K. (2021) Geometric and dosimetric accuracy of deformable image registration between average-intensity images for 4DCT-based adaptive radiotherapy for non-small cell lung cancer. *Journal of Applied Clinical Medical Physics.* **22**(8): 156–67.

53. COLEN RR, ROLFO C, AK M, AYOUB M, AHMED S, ELSHAFEEY N, MAMINDLA P, ZINN PO, NG C, VIKRAM R, BAKAS S, **PETERSON CB**, ET AL. (2021) Radiomics analysis for predicting pembrolizumab response in patients with advanced rare cancers. *Journal for Immunotherapy of Cancer.* **9**(4): e001752.

54. OLANREWAJU A, COURT LE, ZHANG L, NAIDOO K, BURGER H, …, **PETERSON CB**, BENSON KR, DU TOIT M, VAN REENEN R, BEADLE BM. (2021) Clinical acceptability of automated radiation treatment planning for head and neck cancer using the radiation planning assistant. *Practical Radiation Oncology.* **11**(3): 177-184.

55. RIGAUD B, ANDERSON BM, YU ZH, GOBELI M, CAZOULAT G, …, **PETERSON CB**, COURT LE, SVENSSON S, LÖFMAN F, KLOPP AH, BROCK KK. (2021) Automatic segmentation using deep learning to enable online dose optimization during adaptive radiation therapy of cervical cancer. *International Journal of Radiation Oncology*Biology*Physics.* **109**(4): 1096–1110.

56. VASSILIEV ON, **PETERSON CB**, CHANG JY, MOHAN R. (2021) Using FFF beams to improve the therapeutic ratio of lung SBRT. *Journal of Radiotherapy in Practice.* **20**(4): 419–425.

57. NETHERTON TJ, RHEE DJ, CARDENAS CE, CHUNG C, KLOPP AH, **PETERSON CB**, HOWELL RM, BALTER PA, COURT LE. (2020) Evaluation of a multiview architecture for automatic vertebral labeling of palliative radiotherapy simulation CT images. *Medical Physics.* **47**(11): 5592–5608.

58. Branco D, Kry S, Taylor P, Rong J, Zhang X, **Peterson CB**, Frank S, Followill D. (2020) Development of a stereoscopic CT metal artifact management algorithm using gantry angle tilts for head and neck patients. *Journal of Applied Clinical Medical Physics.* **21**(8): 120–130.

59. Glenn MC, **Peterson CB**, Howell RM, Followill DS, Pollard-Larkin JM, Kry SF. (2020) Sensitivity of IROC phantom performance to radiotherapy treatment planning system beam modeling parameters based on community-driven data. *Medical Physics.* **47**(10): 5250–5259.

60. McCulloch MM, Cazoulat G, Ford AC, Elgohari B, Bahig H, ..., **Peterson CB**, et al. (2020) Biomechanical modeling of radiation dose-induced volumetric changes of the parotid glands for deformable image registration. *Physics in Medicine and Biology.* **65**(16): 165017.

61. Edward SS, Alvarez PE, Taylor PA, Molineu HA, **Peterson CB**, Followill DS, Kry SF. (2020) Differences in the patterns of failure between IROC lung and spine phantom irradiations. *Practical Radiation Oncology.* **10**(5): 372–381.

62. Edward SS, Glenn MC, **Peterson CB**, Balter PA, Pollard-Larkin JM, Howell RM, Followill DS, Kry SF. (2020) Dose calculation errors as a component of failing IROC lung and spine phantom irradiations. *Medical Physics.*

63. Vassiliev ON, **Peterson CB**, Grosshans DR, Mohan R. (2020) A simple model for calculating relative biological effectiveness of X-rays and gamma radiation in cell survival. *The British Journal of Radiology.* **93**: 20190949.

64. Tinoco M, Waga E, Tran K, Vo H, Baker J, Hunter R, **Peterson CB**, Taku N, Court L. (2020) RapidPlan development of VMAT plans for cervical cancer patients in low- and middle-income countries. *Medical Dosimetry.* **45**(2): 172–178.

65. Chen C, Hung G, Shen T, **Peterson CB**, Pan T. (2020) Comparison of ejection fraction calculation between CT and SPECT at high heart rate – a dynamic cardiac phantom study. *Journal of Nuclear Cardiology.*

66. Rigaud B, Cazoulat G, Vedam S, Venkatesan AM, **Peterson CB**, Taku N, Klopp AH, Brock KK. (2020) Modeling complex deformations of the sigmoid colon between external beam radiotherapy and brachytherapy images of cervical cancer. *International Journal of Radiation Oncology * Biology * Physics.* **106**(5): 1084–1094.

67. Glenn MC, **Peterson CB**, Followill DS, Howell RM, Pollard-Larkin JM, Kry SF. (2020) Reference dataset of users' photon beam modeling parameters for the Eclipse, Pinnacle, and RayStation treatment planning systems. *Medical Physics.* **47**(1): 282–288.

68. Meier JG, Erasmus JJ, Gladish GW, **Peterson CB**, Diab RH, Mawlawi OR. (2019) Characterization of continuous bed motion effects on patient breathing and respiratory motion correction in PET/CT imaging. *Journal of Applied Clinical Medical Physics.*

69. Vassiliev ON, **Peterson CB**, Cao W, Grosshans DR, Mohan R. (2019) Systematic microdosimetric data for protons of therapeutic energies calculated with Geant4-DNA. *Physics in Medicine & Biology.* **64**(21): 215018.

70. Rhee DJ, Cardenas CE, Elhalawani H, McCarroll R, Zhang L, Yang J, Garden AS, **Peterson CB**, Beadle BM, Court LE. (2019) Automatic detection of contouring errors using convolutional neural networks. *Medical Physics.* **46**(11): 5086–5097.

71. McCulloch M, Anderson B, Cazoulat G, **Peterson CB**, Mohamed A, Volpe S, et al. (2019) Biomechanical modeling of neck flexion for deformable alignment of the salivary glands in head and neck cancer images. *Physics in Medicine and Biology.* **64**(17): 175018.

72. Kry S, Glenn M, **Peterson CB**, Branco D, Mehrens H, Steinmann A, Followill D. (2019) Independent recalculation outperforms traditional measurement-based IMRT QA methods in detecting unacceptable plans. *Medical Physics.* **46**(8): 3700–3708.

73. McCARROLL RE, BEADLE BM, BALTER PA, BURGER H, CARDENAS CE, DALVIE S, ..., **PETERSON CB**, VORSTER K, WETTER J, ZHANG L, COURT LE, YANG J. (2018) Retrospective validation and clinical implementation of automated contouring of organs at risk in the head and neck: a step toward automated radiation treatment planning for low- and middle-income countries. *Journal of Global Oncology*.

74. RUBINSTEIN A, GAY S, **PETERSON CB**, KINGSLEY CV, TAILOR RC, POLLARD-LARKIN JM, MELANCON AD, FOLLOWILL DS, COURT LE. (2018) Radiation-induced lung toxicity in mice irradiated in a strong magnetic field. *PLoS ONE*. **13**(11): e0205803.

75. OWENS CA, **PETERSON CB**, TANG C, KOAY EJ, YU W, MACKIN DS, LI J, SALEHPOUR MR, FUENTES DT, COURT LE, AND YANG J. (2018) Lung tumor segmentation methods: impact on the uncertainty of radiomics features for non-small cell lung cancer. *PLoS ONE*. **13**(10): e0205003.

76. KISLING KD, GER RB, NETHERTON TJ, CARDENAS CE, OWENS CA, ANDERSON BM, ..., **PETERSON CB**, COURT LE, DUBE S. (2018) A snapshot of medical physics practice patterns. *Journal of Applied Clinical Medical Physics*. **19**(6): 306–315.

77. VASSILIEV ON, KRY SF, WANG HC, **PETERSON CB**, CHANG JY, MOHAN R. (2018) Radiotherapy of lung cancers: FFF beams improve dose coverage at tumor periphery compromised by electronic disequilibrium. *Physics in Medicine & Biology*.

78. KRY S, **PETERSON CB**, HOWELL R, IZEWSKA J, LYE J, CLARK C, ET AL. (2018) Remote beam output audits: a global assessment of results out of tolerance. *Physics & Imaging in Radiation Oncology*. **7**: 39–44.

79. COURT LE, KISLING K, McCARROLL R, ZHANG L, YANG J, SIMONDS H, ..., **PETERSON CB**, BEADLE B. (2018) Radiation planning assistant – A streamlined, fully automated radiotherapy treatment planning system. *The Journal of Visualized Experiments*. **134**: e57411.

Statistical applications and collaborations: Immunotherapy

80. ZHOU Y, MEDIK Y, PATEL B, ZAMLER D, CHEN S, CHAPMAN T, ..., **PETERSON CB**, ET AL. (2023) Intestinal toxicity to CTLA-4 blockade driven by IL-6 and myeloid infiltration. *Journal of Experimental Medicine*. **220**(2): e20221333.

81. MENDOZA TR, HONG DS, **PETERSON CB**, STEPHEN B, DUMBRAVA E, ET AL. (2022) Patient-reported symptom burden in patients with rare cancers receiving pembrolizumab in a phase II clinical trial. *Scientific Reports*. **12**(1): 14367

82. MENDOZA TR, SHESHADRI A, ALTAN M, HESS K, GEORGE G, STEPHEN B, CASTILLO L, RODRIGUEZ E, GONG J, **PETERSON CB**, ET AL. (2020) Evaluating the psychometric properties of the Immunotherapy module of the MD Anderson Symptom Inventory. *Journal for Immunotherapy of Cancer*. **8**(2): e000931.

Statistical applications and collaborations: Leukemia

83. GORDON MJ, JONES JE, GEORGE B, **PETERSON CB**, BURGER JA, ET AL. (2023) Long-term outcomes in patients with chronic lymphocytic leukemia treated with ibrutinib: Focus on hypertension and cardiovascular toxicity. *Cancer*. **129**(14): 2192–2200.

84. THOMPSON PA, KEATING MJ, FERRAJOLI A, JAIN N, **PETERSON CB**, ET AL. (2023) Venetoclax consolidation in high-risk CLL treated with ibrutinib for ≥ 1 year achieves a high rate of undetectable MRD. *Leukemia*. **37**: 1444–1453.

85. THOMPSON PA, BAZINET A, WIERDA WG, TAM CS, O'BRIEN SM, SAHA S, **PETERSON CB**, PLUNKETT W, KEATING MJ. (2023) Sustained remissions in CLL after frontline FCR treatment with very long-term follow-up. *Blood*. **142**(21): 1784–1788.

86. Chien KC, **Peterson CB**, Young E, Chihara D, Manasanch E, Ramdial J, Thompson PA. (2023) Outcomes of breakthrough COVID-19 infections in patients with hematologic malignancies. *Blood Advances.* bloodadvances.2022008827.

87. Thompson P, Jiang X, Banerjee P, Basar R, Garg N, Chen K, Kaplain M, Nunez Cortes A, Ferrajoli A, Keating M, **Peterson CB**, Andreeff M, Rezvani K, Wierda W. (2022) A phase two study of high-dose blinatumomab in Richter's syndrome. *Leukemia.* **36**(9): 2228–2232.

88. Thompson PA, Srivastava J, **Peterson CB**, Strati P, Jorgensen JL, Hether T, et al. (2019) Minimal residual disease undetectable by next-generation sequencing predicts improved outcome in CLL after chemoimmunotherapy. *Blood.* **134**(22): 1951–1959.

89. Strati P, Takahashi K, **Peterson CB**, Keating MJ, Thompson PA, Daver NG, et al. (2019) Efficacy and predictors of response of lenalidomide and rituximab in patients with treatment-naïve and relapsed CLL. *Blood Advances.* **3**(9): 1533–1539.

90. Thompson PA, **Peterson CB**, Strati P, Jorgensen J, Keating MJ, O'Brien SM, et al. (2018) Serial minimal residual disease (MRD) monitoring during first-line FCR treatment for CLL may direct individualized therapeutic strategies. *Leukemia.* **32**(11): 2388–2398.

Statistical applications and collaborations: Ovarian cancer

91. Swisher EM, Rayes N, Bowen D, **Peterson CB**, Norquist BM, et al. (2023) Remotely delivered cancer genetic testing in the Making Genetic Testing Accessible (MAGENTA) trial. *JAMA Oncology.* **9**(11): 1547–1555.

92. Coffin T, Bowen D, Swisher E, Lu K, Rayes N, ..., **Peterson CB**, et al. (2022) An accessible communication system for population-based genetic testing: development and usability study. *JMIR Formative Research.* **6**(10): e34055.

93. Coffin T, Bowen D, Lu K, Swisher E, Rayes N, ..., **Peterson CB**, et al. (2022) Using social media to facilitate communication about women's testing: tool validation study. *JMIR Formative Research.* **6**(9): e35035.

94. Rayes N, Bowen DJ, Coffin T, Nebgen D, **Peterson CB**, Munsell MF, et al. (2019) MAGENTA (Making Genetic Testing Accessible): a prospective randomized controlled trial comparing online genetic education and telephone genetic counseling for hereditary cancer genetic testing. *BMC Cancer.* **19**: 648.

Statistical applications and collaborations: Kidney cancer

95. Liu XD, Zhang YT, McGrail DJ, Zhang X, Lam T, Hoang A, Hasanov E, Manyam G, **Peterson CB**, et al. (2023) SETD2 loss and ATR inhibition synergize to promote cGAS signaling and immunotherapy response in renal cell carcinoma. *Clinical Cancer Research.* **29**(19): 4002–4015.

96. Liu X, Kong W, **Peterson CB**, McGrail DJ, Hoang, et al. (2020) PBRM1 loss defines a nonimmunogenic tumor phenotype associated with checkpoint inhibitor resistance in renal carcinoma. *Nature Communications.* **11**(1): 1–14.

Statistical applications and collaborations: Head and neck cancer

97. Barbon CE, **Peterson CB**, Moreno AC, Lai SY, Reddy JP, Sahli A, Martino R, Johnson FM, Fuller CD, Hutcheson KA. (2022) Adhering to eat and exercise status during radiotherapy for oropharyngeal cancer for prevention and mitigation of radiotherapy-associated dysphagia. *JAMA Otolaryngology.*

98. Barbon CE, Yao CM, **Peterson CB**, Moreno AC, Goepfert RP, Johnson FM, Chronowski GM, Fuller CD, Gross ND, Hutcheson KA. (2022) Swallowing after primary TORS and unilateral or bilateral radiation for low-to intermediate-risk tonsil cancer. *Otolaryngology–Head and Neck Surgery*. **167**(3): 484–493.

Statistical applications and collaborations: Cancer biomarkers and drug discovery

99. Fahrmann JF, Wasylishen AR, Pieterman CR, Irajizad E, Vykoukal J, Wu R, Dennison JB, **Peterson CB**, et al. Blood-based proteomic signatures associated with MEN1-related duodenopancreatic neuroendocrine tumor progression. *The Journal of Clinical Endocrinology & Metabolism*. **108**(12): 3260–3271

100. Lim B, **Peterson CB**, Davis A, Cho E, Pearson T, Liu H, Hwang M, Ueno NT, Lee J. (2021) ONC201 and an MEK inhibitor trametinib synergistically inhibit the growth of triple-negative breast cancer cells. *Biomedicines*. **9**(10):1410.

101. McGrail DJ, Pilié PG, Dai H, Lam TN, Liang Y, Voorwerk L, Kok M, Zhang XH, Rosen JM, Heimberger AB, **Peterson CB**, Jonasch E, Lin S. (2021) Replication stress response defects are associated with response to immune checkpoint blockade in nonhypermutated cancers. *Science Translational Medicine*. **13**(617): eabe6201.

102. Fahrmann JF, Wasylishen AR, Pieterman CR, Irajizad E, Vykoukal J, Murage E, Wu R, Dennison JB, Krishna H, **Peterson CB**, Lozano G, et al. (2021) A blood-based polyamine signature associated with MEN1 duodenopancreatic neuroendocrine tumor progression. *The Journal of Clinical Endocrinology & Metabolism*. **106**(12): e4969–80.

103. Bradley SD, Talukder AH, Lai I, Davis R, Alvarez H, ..., **Peterson CB**, et al. (2020) Vestigial-like 1 is a shared targetable cancer-placenta antigen expressed by pancreatic and basal-like breast cancers. *Nature Communications*. **11**(1): 1–12.

104. Vykoukal J, Fahrmann JF, Gregg JR, Tang Z, Basourakos S, ..., **Peterson CB**, Davis JW, Kim J, Hanash S, Thompson TC. (2020) Caveolin-1-mediated sphingolipid oncometabolism underlies a metabolic vulnerability of prostate cancer. *Nature Communications*. **11**(1): 1–6.

105. Wu X, Park M, Sarbassova DA, Ying H, Lee MG, Bhattacharya R, Ellis L, **Peterson CB**, Hung MC, Lin HK, Bersimbaev RI, Song MS, Sarbassov, DD. (2020) A chirality-dependent action of vitamin C in suppressing KRAS mutant tumor growth by the oxidative combination: rationale for cancer therapeutics. *International Journal of Cancer*. **146**(10): 2822–2828.

106. Chari NS, Ivan C, Le X, Li J, Mijiti A, Patel AA, Osman AA, **Peterson CB**, et al. (2020) Disruption of TP63-miR-27a* feedback loop by mutant TP53 promotes head and neck cancer progression. *Journal of the National Cancer Institute*. **112**(3): 266–277.

107. Fahrmann JF, Vykoukal J, Fleury A, Tripathi S, Dennison JB, Murage E, ..., **Peterson CB**, Katayama H, Disis ML, Arun B, Hanash S. (2020) Association between plasma diacetylspermine and tumor spermine synthase with outcome in triple negative breast cancer. *Journal of the National Cancer Institute*. **112**(6): 607–616.

Statistical applications and collaborations: Genetics, genomics, and proteomics

108. Jasinska AJ, Zelaya I, Service SK, **Peterson CB**, Cantor RM, et al. (2017) Genetic variation and gene expression across multiple tissues and developmental stages in a non-human primate. *Nature Genetics*. **49**(12): 1714–1721.

109. GTEx Consortium [including **Peterson CB**]. (2017) Genetic effects on gene expression across human tissues. *Nature*. **550**(7675): 204–213. Contributed analysis, text, and figures.

110. **Peterson CB**, Service S, Jasinska A, Gao F, Zelaya I, Teshiba T, Bearden C, Reus V, Macaya G, López-Jaramillo C, Bogomolov M, Benjamini Y, Eskin E, Coppola G, Freimer N, Sabatti C. (2016) Characterization of expression quantitative trait loci in pedigrees from Colombia and Costa Rica ascertained for bipolar disorder. *PLoS Genetics.* **12**(5): e1006046.

111. Rembach A, Stingo FC, **Peterson CB**, Vannucci M, Do K, Wilson WJ, Macaulay SL, Ryan TM, Martins RN, Ames D, Masters CL, Doecke JD, the AIBL Research Group. (2014) Bayesian graphical network analyses reveal complex biological interactions specific to Alzheimer's Disease. *Journal of Alzheimer's Disease.* **10**(4): P796–P797.

112. Cowley AW, Moreno C, Jacob HJ, **Peterson CB**, Stingo FC, Ahn KW, Liu P, Vannucci M, Laud PW, Reddy P, Lazar J, Evans L, Yang C, Kurth T, Liang M. (2014) Characterization of biological pathways associated with a 1.37 Mbp genomic region protective of hypertension in Dahl S rats. *Physiological Genomics.* **46**(11): 398–410.

113. Swartz MD, **Peterson CB**, Lupo PJ, Wu X, Forman MR, Spitz MR, Hernandez LM, Vannucci M, Shete S. (2013) Investigating multiple candidate genes and nutrients in the folate metabolism pathway to detect genetic and nutritional risk factors for lung cancer. *PLoS ONE.* **8**(1): e53475. doi:10.1371/journal.pone.0053475

Book chapters

114. **Peterson CB**, Stingo F. (2021) Bayesian estimation of single and multiple graphs. In *Handbook of Bayesian Variable Selection*, MG Tadesse and M Vannucci (Eds). Chapman and Hall/CRC. 327–348.

115. **Peterson CB**, Swartz MD, Shete S, Vannucci M. (2013) Bayesian model averaging for genetic association studies. In *Advances in Statistical Bioinformatics: Models and Integrative Inference for High-Throughput Data*, K Do, Z Qin and M Vannucci (Eds). Cambridge University Press, 208–223.

Other papers and discussions

116. Osborne N, **Peterson CB**, Vannucci M. (2020) Network estimation of compositional data. In *Book of Short Papers - Italian Statistical Society 2020*, Pollice A, Salvati N, Schirripa Spagnolo F (Eds). Pearson, 28–33.

117. **Peterson CB**, Stingo FC. (2013) Invited discussion of "On the prior and posterior distributions used in graphical modelling" by Marco Scutari. *Bayesian Analysis.* **8**(3): 539–542.

Thesis

118. **Peterson CB.** (2013) Bayesian graphical models for biological network inference. Doctoral thesis, Rice University.

Talks

Invited seminars

New methods for microbiome data integration. Biostatistics Seminar, Department of Biostatistics, VCU School of Medicine, Richmond, VA. April 14, 2023

Meta-analysis of safety data. Biostatistics and Data Science Seminar, Department of Data Science, University of Mississippi Medical Center, Jackson, MS. March 1, 2023

New methods for microbiome data integration. Statistics Seminar, Department of Mathematical Sciences, The University of Texas at Dallas, Dallas, TX. February 11, 2023

New approaches for integrating microbiome and covariate data. Department of Population and Quantitative Health Sciences, Case Western Reserve University School of Medicine, Cleveland, OH. November 17, 2022

New approaches for integrating microbiome and covariate data. Center for Computational, Evolutionary and Human Genomics Seminar. Stanford University, Stanford, CA. October 26, 2022

New approaches for integrating microbiome and covariate data. Biostatistics Seminar. University of Pennsylvania, Philadelphia, PA. September 21, 2021

Visualization and feature selection for microbiome data. Biostatistics Seminar. Ohio State University, Columbus, OH. September 3, 2021

New approaches for visualization and clustering of microbiome data. Human Genetics Center Seminar. UTHealth School of Public Health, Houston, TX. February 1, 2021

New approaches for visualization and clustering of microbiome data. Cancer Biostatistics Seminar. University of Michigan, Ann Arbor, Michigan. September 11, 2020

Bayesian variable selection for microbiome data. Statistics Colloquium. Texas A&M University, College Station, Texas. January 17, 2020

Flexible and informative clustering of microbiome data. Statistics Colloquium. Rice University, Houston, Texas. September 16, 2019

Integrative network analyses using Bayesian graphical models. Biostatistics Seminar. Fred Hutchinson Cancer Research Center, Seattle, Washington. November 1, 2017

Bayesian inference of multiple Gaussian graphical models. Harvard/MIT Joint Econometrics Seminar. Harvard University, Cambridge, Massachusetts. November 3, 2016

CONFERENCE PRESENTATIONS

Tree-aggregated factor regression for microbiome data integration. Invited presentation. ICSA 2023 Applied Statistics Symposium, Ann Arbor, MI. June 12, 2023.

Bayesian learning of multiple non-linear dependence networks. Invited presentation. New England Statistics Symposium, Boston, MA. June 6, 2023.

Bayesian sparse modeling to identify high-risk subgroups. Invited presentation. Joint Statistical Meetings, Washington, DC. August 9, 2022.

Identifying covariate-driven connections in directed networks. Invited presentation. ENAR Spring Meeting, Houston, TX. March 28, 2022.

Scalable Bayesian inference of networks and covariate effects. Invited presentation. Joint Statistical Meetings. August 12, 2021.

Flexible and informative clustering of microbiome data. Invited presentation. ICSA Applied Statistics Symposium, Houston, TX. December 12, 2020.

Efficient Bayesian estimation of microbiome association networks. Invited presentation. Joint Statistical Meetings, Philadelphia, PA. August 5, 2020.

Bayesian modeling of multiple structural connectivity networks during the progression of Alzheimer's disease. Invited presentation. ENAR Spring Meeting, Nashville, TN. March 25, 2020.

Bayesian variable selection for microbiome data. Invited presentation. iBRIGHT conference, Houston, TX. November 12, 2019.

A Bayesian classification model for radiomics data. Invited presentation. WNAR Annual Meeting, Portland, Oregon. June 25, 2019.

Bioinformatics tools to gain insight into proteomic and genomic data. Invited presentation. International VHL Medical/Research Symposium, Houston, Texas. October 4, 2018.

Bayesian hierarchical modeling for inference of multiple graphical models. Invited presentation. ENAR Spring Meeting, Atlanta, Georgia. March 27, 2018.

Bayesian multivariate modeling of pathways underlying disease severity in COPD. Invited presentation. ENAR Spring Meeting, Austin, Texas. March 9, 2016.

Savage Award winner: Approaches in Bayesian graphical modeling. Topic-contributed presentation. Joint Statistical Meetings, Seattle, Washington. August 10, 2015.

SBSS student paper award winner: Bayesian inference of multiple Gaussian graphical models. Topic-contributed presentation. Joint Statistical Meetings, Boston, Massachusetts. August 4, 2014.

Bayesian inference of multiple Gaussian graphical models. Invited presentation. Joint Applied Statistics Symposium of International Chinese Statistical Association & Korean International Statistical Society, Portland, Oregon. June 18, 2014.

Bayesian inference of multiple Gaussian graphical models. Topic-contributed presentation. Joint Statistical Meetings, Montreal, Canada. August 8, 2013.

Bayesian inference of multiple Gaussian graphical models. Contributed presentation. ENAR Spring Meeting, Orlando, Florida. March 12, 2013.

Inferring biological networks using the Bayesian graphical lasso with informative priors. Contributed presentation. Joint Statistical Meetings, San Diego, California. July 20, 2012.

Inferring metabolic networks using the Bayesian graphical lasso. Plenary presentation. NLM Informatics Training Conference, Madison, Wisconsin. June 27, 2012.

Awards and fellowships

2020	Nominee, Robert M. Chamberlain Distinguished Mentor Award, MD Anderson Postdoctoral Association
2015	Savage Award for best dissertation in applied methodology, International Society for Bayesian Analysis (ISBA)
2014	Postdoctoral Fellowship, Stanford Center for Computational, Evolutionary, and Human Genomics (CEHG)
2014	Section on Bayesian Statistical Science (SBSS) student paper competition award winner
2011 - 2013	Predoctoral Fellowship, National Library of Medicine (NLM) Biomedical Informatics Research Training Program
2009 - 2011	Predoctoral Fellowship, T32 Training Grant in Biostatistics for Cancer Research, National Cancer Institute (NCI)
2009 - 2010	President's Graduate Fellowship, Rice University
2005	Phi Beta Kappa ($\sim$ top 10% of class), Harvard University

EDUCATION

TEACHING

SPRING/FALL 2017–2022	*Guest lecturer*, Graduate Seminar in Statistics (STAT 600), Rice University.
FALL 2019	*Course coordinator & guest lecturer*, Bayesian Data Analysis (GS01 1013), Graduate School of Biological Sciences.
SPRING 2018	*Guest lecturer*, Professional Development for Bioinformatics (COMP 573), Rice University.
OCTOBER 2016	*Instructor*, Understanding Diagnostic Tests (Continuing Medical Education seminar), General Internal Medicine, The University of Texas MD Anderson Cancer Center.
FALL 2010	*Teaching Assistant*, Statistics for the Biosciences (STAT 305), Rice University. Held weekly lab focusing on data analysis in R and graded labs and final exams.
FEBRUARY 2010	*Teaching Assistant*, Data Visualization Mini-Course, Rice University. Helped attendees successfully produce advanced graphics using R.
FALL 2009	*Teaching Assistant*, Applied Probability (STAT 331), Rice University. Led weekly review and graded homework.
FALL 2004	*Teaching Fellow*, Formal Systems and Computation (CS 121), Harvard University. Created lesson plans, taught weekly section, and composed both problem sets and exams.
FALL 2002	*Course Assistant*, Calculus, Series, and Differential Equations (Math 1b), Harvard University. Led weekly review, graded homework, and offered drop-in tutoring at the Math Question Center.

MENTORSHIP
Current

PhD STUDENTS

Kai Jiang, PhD student, Biostatistics, University of Texas School of Public Health. 2023–present

Kevin McCoy, PhD student, Statistics, Rice University. 2023–present. Recipient of National Science Foundation Graduate Research Fellowship Program (NSF GRFP) award, 2023.

Ziyi Wang, PhD student, Biostatistics, University of Texas School of Public Health. 2022–present

Yangfan Ren, PhD student, Statistics, Rice University. Joint with Marina Vannucci. 2021–present

Zachary Wooten, PhD student, Statistics, Rice University. 2020–present. Recipient of National Science Foundation Graduate Research Fellowship Program (NSF GRFP) award, 2021.

POSTDOCS

Satabdi Saha. 2022–present

Alumni

DOCTORAL ALUMNI

Licai Huang, now Bioinformatics and Data Scientist at GRAIL. PhD, Quantitative Sciences, 2023. Thesis title: Statistical modeling approaches for the inference of cancer mechanisms.

Sarah Robinson, now Data Scientist II at Microsoft. PhD, Statistics, Rice University, 2022. Thesis title: Joint estimation and selection of multiple graphical models for microbiome data. Recipient of National Science Foundation Graduate Research Fellowship (NSF GRFP) award, 2019.

Nathan Osborne, now Senior Data Scientist at Intuit. PhD, Statistics, Rice University, 2021. Joint with Marina Vannucci. Thesis title: Advances in Bayesian approaches for directed and undirected graphical models. Student paper award winner, American Statistical Association (ASA) Statistical Computing and Graphics Section, 2020.

Xinyue Qi, now Manager of Biostatistics at Gilead Sciences.PhD, Biostatistics, University of Texas School of Public Health, 2020. Co-supervised with Shouhao Zhou. Thesis title: Bayesian modeling of censored data with application to meta-analysis of immunotherapy trials. Student paper award winner, ICSA Applied Statistics Symposium, 2020.

Katherine Shoemaker, now Assistant Professor of Statistics, Department of Mathematics & Statistics, University of Houston-Downtown. PhD, Statistics, Rice University, 2019. Thesis title: Statistical approaches for interpretable radiomics.

POSTDOC ALUMNI

Liangliang Zhang, now Assistant Professor of Biostatistics and Quantitative Health, Case Western Reserve University. Joint with Kim-Anh Do and Robert Jenq, 2017–2021

Briceön Wiley, now Professor of Practice, Department of Decision & Information Sciences, University of Houston. 2020–2021.

Yushu Shi, now Assistant Professor of Statistics, University of Missouri. Joint with Kim-Anh Do and Robert Jenq, 2017–2020.

Priyam Das, now Assistant Professor, Department of Biostatistics, Virginia Commonwealth University. Joint with Kim-Anh Do and Veera Baladandayuthapani, 2017–2019.

UNDERGRAD STUDENTS

Kendall Lemons, now PhD student at Weill Cornell Medicine. Summer intern while at Prairie View A&M University, Summer 2021.

PhD advisory committees

Zhichao Xu, PhD, Quantitative Sciences. In progress

Shan He, PhD, Quantitative Sciences. In progress

Paige Taylor, PhD, Medical Physics. In progress

Hunter Mehrens, PhD, Medical Physics. In progress

Barbara Marquez, PhD, Medical Physics. In progress

Fre'Etta Brooks, PhD, Medical Physics. In progress

Shannon Hartzell, PhD, Medical Physics, 2023. Thesis title: Uncertainty in the physical basis of estimates of relative biological effectiveness in carbon radiotherapy

Constance Owens, PhD, Medical Physics, 2023. Thesis title: Risk and risk factors for colorectal subsequent malignancies in survivors of childhood cancer: a report from the Childhood Cancer Survivor Study

Mary Gronberg, PhD, Medical Physics, 2023. Thesis title: The development of artificial intelligence-based tools for expert peer review of radiotherapy treatment plans

Kareem Wahid, PhD, Quantitative Sciences, 2023. Thesis title: Multiparametric magnetic resonance imaging artificial intelligence pipeline for oropharyngeal cancer radiotherapy treatment guidance

Sharbacha Edward, PhD, Medical Physics, 2022. Thesis title: Quantifying the magnitude of total dose deviation caused by various sources of error among IROC phantom irradiation results

Tucker Netherton, PhD, Medical Physics, 2021. Thesis title: A fully-automated, deep learning-based framework for computed tomography-based localization, segmentation, verification, and treatment planning of metastatic vertebrae

Cayla Wood, PhD, Medical Physics, 2021. Thesis title: Development of quantitative molecular photoacoustic imaging for noninvasive cancer diagnostics

Trevor Mitcham, PhD, Medical Physics, 2021. Thesis title: Ultrasound-mediated molecular imaging of the tumor microenvironment

Mallory Carson Glenn, PhD, Medical Physics, 2020. Thesis title: Characterization of treatment planning system photon beam modeling errors in IROC Houston phantom irradiations

Joseph Meier, PhD, Medical Physics, 2019. Thesis title: Assessment of new innovations in PET/CT for respiratory motion correction

Elin Shaddox, PhD, Statistics, Rice University. 2019. Thesis title: Bayesian graphical models for multiple networks

Youyi Zhang, PhD, Quantitative Sciences, 2018. Thesis title: Bayesian integrative analysis of omics data

Rachel McCarroll, PhD, Medical Physics, 2018. Thesis title: Equipment to address infrastructure and human resource challenges for radiotherapy in low-resource settings

Ashley Rubinstein, PhD, Medical Physics, 2017. Thesis title: A pre-clinical study of radiation-induced lung toxicity when irradiating in a strong magnetic field

Xenia Favé, PhD, Medical Physics, 2017. Thesis title: Detecting and evaluating therapy induced changes in radiomics features measured from non-small cell lung cancer to predict patient outcomes

Master's advisory committees

Shannon Hartzell, SMS, Medical Physics. 2019. Thesis title: Quantifying uncertainty in a measurement-based assessment of relative biological effectiveness in carbon ion radiotherapy

Brandon Luckett, SMS, Medical Physics. 2019. Thesis title: Commissioning of micro-cube thermoluminescent dosimeters for small field dosimetry quality assurance in radiotherapy

Examining committees

Fre'Etta Brooks. Medical Physics. Candidacy exam, May 2022

Mary Gronberg. Medical Physics. Candidacy exam, November 2020

Sharbacha Edward. Medical Physics. Candidacy exam, March 2020

Joseph Meier. Medical Physics. Candidacy exam, July 2019

Constance Owens. Medical Physics. Candidacy exam, March 2019

Tucker Netherton. Medical Physics. Candidacy exam, December 2018

Mallory Carson Glenn. Medical Physics. Candidacy exam, November 2017

SOFTWARE

R package `TreeBH`: Error control for tree-structued hypotheses

Available at https://github.com/cbpeterson/TreeBH

R package `TreeQTL`: Hierarchical error control in eQTL analysis

Available at http://www.bioinformatics.org/treeqtl/

Additional publicly available software

Available at http://odin.mdacc.tmc.edu/~cbpeterson/software.html

Professional activities

Biostatistical reviewer, National Institutes of Health (NIH) special emphasis panels, 2022, 2023

Panel member, National Science Foundation (NSF) grant review panels, 2017, 2020, 2023

Conference organizing committee member, iBRIGHT conference, 2019

Reviewer

Journal of the American Statistical Association

Journal of the Royal Statistical Society

Biometrika

Biometrics

Annals of Applied Statistics

Statistics in Medicine

Statistical Methods in Medical Research

Statistics and Computing

Journal of Statistical Software

BMC Bioinformatics

Frontiers in Genetics

Genome Biology

Journal of Computational Biology

Cancer-related journals: *Nature Cancer*, *Cancer Prevention Research*

Outreach

Presentation to students in Data Science Research Experience for Undergraduates (REU) program, Rice University, 2023

Interview with a Girl Scout for Silver Award project on careers in STEM, 2023. Video available at the [Troop 6784 YouTube channel](#)

Biostatistician, National Cancer Institute (NCI) Renal Task Force, 2017 - 2020

Publication Officer, Section on Bayesian Statistical Science (SBSS), 2024–2026

Judge, Section on Bayesian Statistical Science (SBSS) Student Paper Competition, 2016, 2017, 2020, 2022

Session Chair

ENAR Spring Meeting, 2018

Joint Statistical Meetings, 2012, 2014, 2015

Member, American Statistical Association (ASA), 2010 - present

Institutional service

Member, Institutional Review Board (IRB), 2019 -

Member, Medical Physics Program Steering Committee, 2017 - 2020

Member, Department of Biostatistics Faculty Search Committee, 2018 - 2019, 2022 - 2023