

DIVISION OF BIOSTATISTICS

ANNUAL REPORT 2024



MEDICAL
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BIOSTATISTICS

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EXECUTIVE SUMMARY

This document summarizes the activities of the Division of Biostatistics in the Data Science Institute of the Medical College of Wisconsin for 2024.

The division supports the missions of the Medical College of Wisconsin through the graduate and continuing medical professional training in biostatistics; the support of funded research projects in 2024 valued at \$320 million in external funds for MCW; the prominence in the development of novel statistical methods for biomedical data; and the biostatistical consulting service.

In 2024, the division co-authored 148 papers including 33 notable papers in high impact clinical, biomedical, and statistical journals, (Journal of Clinical Oncology, Blood, Nature Genetics, Nature Communications, Science Advances, Hypertension, Journal of Clinical Investigation, Genome Medicine, Biometrics, Clinical Trials, Statistical Methods in Medical Research, Journal of Quality Technology, Statistics in Biopharmaceutical Research, Statistical Papers, Epigenomics, Clinical Spine Surgery, Journal of Scientific Computing, Journal of Hematology and Oncology, Bioengineering, Biometrical Journal, IEEE International Conference on Big Data, Scientific Reports, PLOS One, Journal of Data Science, Statistics in Biosciences), helped investigators successfully apply for 26 new grants worth \$97 million and collaborated on 232 projects through the Biostatistics Consulting Service.

The division faculty have active research programs in various areas of biostatistics. The division is recognized worldwide for its research in survival analysis. Other areas of investigation include statistical genetics and bioinformatics, Bayesian statistics, big data methods, design and analysis of clinical trials, and multiple comparisons. The division faculty had 23 methodological papers appear as an online publication in 2024.



BIostatISTICS NEWS

On July 1, 2024, the Division of Biostatistics moved from the Institute for Health and Equity (IHE) to the new Data Science Institute, led by its inaugural director Dr. William Hogan. We have enjoyed our long history of being part of the IHE and its preceding forms (Institute for Health and Society, Department of Population Health, Health Policy Institute), and are grateful to the leaders and membership of those groups for their support of the Division of Biostatistics over the years. We look forward now to helping to grow and support data science on campus as part of the new Data Science Institute.

Dr. Kwang Woo Ahn was appointed Chief Statistical Director of the Center for International Blood and Marrow Transplant Research in September 2024. He takes over from Dr. Mei-jie Zhang, who served in this leadership role for the past 9 years and retired from the Medical College of Wisconsin in February 2025. Dr. Zhang had a distinguished career of over 30 years working at MCW and with the CIBMTR, publishing ~300 peer reviewed manuscripts including ~50 in the statistical literature. He is internationally recognized for his expertise in survival analysis, competing risks, and multi-state models. He mentored numerous students, faculty, and staff at MCW with a kind heart and friendly personality. We thank him for his many contributions to the Division of Biostatistics and the CIBMTR and wish him the best in his retirement.

Drs. Wang and Lin received outstanding Graduate School Educator awards in 2024. Yu Wang was selected as a winner of the 2024 Student Paper Award from the American Statistical Associations for his paper on Rforce: Random Forest for Composite Endpoints. Peter Zhang was selected as a winner for the Society for Clinical Trials Thomas C. Chalmers Student Scholarship, for his presentation on Covariate adjusted group sequential comparisons of survival probabilities.

Dr. Logan was one of four co-PIs (with Dr. Mary Horowitz from MCW as contact PI) on a major grant to MCW which was recently re-awarded in 2024: the Data Coordinating Center (DCC) grant for the Blood and Marrow Transplant Clinical Trials Network (BMTCTN). Dr. Martens and Dr. Brazauskas also are co-investigators in the BMTCTN DCC and contributed to the successful grant submission. Several other faculty members continued ongoing methodologic research funded projects, including Dr. Auer (two NIH R01s), Drs. Logan, Laud, and Sparapani (National Marrow Donor Program and Office of Naval Research), Drs. Logan and Martens (R01), Dr. Szabo (R01), and Dr. Jin (R01, U54).

Several of our division faculty members were involved in notable high impact publication.

- Dr. Auer in Epigenomics
- Dr. Banerjee in Clinical Spine Surgery
- Dr. Tarima in Statistics in Biopharmaceutical Research (x2)
- Dr. Chen in Journal of Scientific Computing
- Dr. Auer/Chen in Journal of Hematology and Oncology
- Dr. Ahn/Kim in Biometrics
- Dr. Ahn/Lin in Bioengineering
- Dr. Kim/Martens/Ahn in Biometrical Journal
- Dr. Martens/Logan in Clinical Trials (x2)
- Dr. Auer (x3) and Dr. Jin in Nature Communications
- Dr. Tarima in Statistical Papers
- Dr. Banerjee in IEEE International Conference on Big Data
- Dr. Wang/Lin in Statistical Methods in Medical Research
- Dr. Yang in Journal of Quality Technology
- Dr. Yu in Scientific Reports
- Dr. Yu in PLOS One
- Dr. Yu in Journal of Data Science
- Dr. Yu in Statistics in Biosciences
- Dr. Laud and Dr. Logan (x2) in Journal of Clinical Oncology
- Dr. Auer in Blood
- Dr. Fang/Choppavarapu/Jin in Genome Medicine
- Dr. Auer in Nature Genetics
- Dr. Banerjee and Dr. Lin in Science Advances
- Dr. Szabo in Journal of Clinical Investigation
- Dr. Lin/Auer in Hypertension

BIostatISTICS FACULTY



Kwang Woo Ahn, PhD
Professor of Biostatistics



Paul Auer, PhD
Core Director of Cancer Center & Professor



Anjishnu Banerjee, PhD
Associate Professor of Biostatistics



Ruta Brazaukas, PhD
Associate Professor of Biostatistics



Zhongyuan Chen, PhD
Assistant Professor of Biostatistics



Yan Gao, PhD
Assistant Professor of Biostatistics



Victor Jin, PhD
Professor of Biostatistics, Bioinformatics Core Director



Soyoung Kim, PhD
Associate Professor of Biostatistics



Prakash Laud, PhD
Professor of Biostatistics



Masaki Lin, PhD
Assistant Professor of Biostatistics



Brent Logan, PhD
Director & Professor of Biostatistics



Michael Martens, PhD
Assistant Professor of Biostatistics



Rodney Sparapani, PhD
Associate Professor of Biostatistics



Aniko Szabo, PhD
Professor of Biostatistics



Sergey Tarima, PhD
Associate Professor of Biostatistics



Tao Wang, PhD
Professor of Biostatistics



Kai Yang, PhD
Assistant Professor of Biostatistics



Duo Yu, PhD
Assistant Professor of Biostatistics



Mei-Jie Zhang, PhD
Professor of Biostatistics

BIostatISTICS RESEARCH AND STATISTICAL SUPPORT STAFF



Bethany Canales, MPH
Statistician I



Lavanya Choppvarapu, PhD
Research Scientist I



Farheen Chunara, MS
Biostatistics Analyst I



Ryan Conrardy, MS
Biostatistics Analyst I



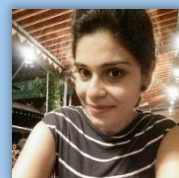
Kun Fang, MS
Post-Doctoral Associate



Sravya Gethika, MS
Statistical Programmer Analyst I



Manzur Farazi, PhD
Statistical Research Scientist II



Simran Kaur, MS
Statistical Programmer Analyst I



Joy Liu, MS
Biostatistics Analyst II



Tianxiang Liu, MS
Post-Doctoral Associate



Xiolong Ma, MS
Bioinformatics Analyst I



Lisa Rein, MS
Biostatistics Analyst III



Michelle Teng, MS
Biostatistics Analyst II



Yushan Yang, MS
Biostatistics Analyst I



Alexis Visotcky, MS
Biostatistics Analyst III

BIostatISTICS ADMINISTRATIVE SUPPORT



Kellie Bialzik, MBA
Business Manager, Sr.



Jennifer Ward
Research Program Coordinator II



McKenna Busse
Financial Assistant II



Gabriel Williams
Administrative Assistant

METHODOLOGIC RESEARCH

The division faculty have active research programs in various areas of biostatistics. The division is recognized worldwide for its research in survival analysis. Other areas of investigation include statistical genetics, Bayesian statistics, big data methods, design and analysis of clinical trials, and multiple comparisons. The division faculty had 23 methodological papers that appeared in statistical literature with an online publication date in 2024. (See list below). In addition to publications, the Division of Biostatistics also presented 6 methodological presentations/abstracts (See Appendix 1).

- Alsup A, Nissen E, Salas LA, Molinaro AM, Reiner A, Liu S, Madsen TE, Liu L, Auer PL, et al. An assessment of compositional methods for the analysis of DNA methylation-based deconvolution estimates. *Epigenomics*;16(15-16):1067-1080. PMID: 39093129. 08/02/2024.
- Banerjee A, Yang Y, Wang MC, Vedantam A. Recovery Trajectories of Patient-reported Outcomes After Surgery for Degenerative Cervical Myelopathy: A Bayesian Latent Class Modeling Approach. *Clinical spine surgery*. PMID: 39037072. 07/22/2024
- Calderazzo S, Tarima S, Reid C, Flournoy N, Friede T, Geller N, et al. Coping with Information Loss and the Use of Auxiliary Sources of Data: A Report from the NISS Ingram Olkin Forum Series on Unplanned Clinical Trial Disruptions. *Statistics in Biopharmaceutical Research*;16(2):141-157. 01/01/2024
- Chen Z., Sun J., and Xia J. A robust randomized indicator method for accurate symmetric eigenvalue solution. *Journal of Scientific Computing*;100:48. 06/28/2024.
- Dong J, Arsang-Jang S, Zhang T, Chen Z, Bolon YT, Spellman S, Urrutia R, Auer P, Saber W. Prognostic impact of donor mitochondrial genomic variants in myelodysplastic neoplasms after stem-cell transplantation. *Journal of hematology & oncology*;17(1):104. PMID: 39497145. 11/05/2024.
- Fang X, Ahn KW, Cai J, Kim S. Efficient estimation for left-truncated competing risks regression for case-cohort studies. *Biometrics*;80(1). PMID: 38281769. 01/29/2024.
- Hu H, Kothari AN, Banerjee A. Personalized Federated Learning for Gastric Cancer: Adaptive Inference from Large Heterogeneous Piecewise Electronic Health Record Based Biomedical Data Proceedings - 2024 IEEE International Conference on Big Data, Big Data:4554-4563. 01/01/2024.
- Kemmo Tsafack U, Ahn KW, Kwitek AE, Lin CW. Meta-Analytic Gene-Clustering Algorithm for Integrating Multi-Omics and Multi-Study Data. *Bioengineering (Basel, Switzerland)*;11(6). PMID: 38927823. 06.24.2024.
- Kim S, Martens MJ, Ahn KW. Test Statistics and Statistical Inference for Data With Informative Cluster Sizes. *Biometrical journal. Biometrische Zeitschrift*;67(1):e70021. PMID: 39686682. 12/17/2024.
- Kunz CU, Tarima S, Rosner GL, Emsley R, Bauer M, Jennison C, Rosenberger JL, Stallard N, Zohar S, Flournoy N. Bayesian and Frequentist Approaches to Rescuing Disrupted Trials: A Report from the NISS Ingram Olkin Forum Series on Unplanned Clinical Trial Disruptions. *Statistics in Biopharmaceutical Research*; 16(4):383-402. 01/01/2024.
- Martens MJ, Lian Q, Geller NL, Leifer ES, Logan BR. Sequential monitoring of time-to-event safety endpoints in clinical trials. *Clinical Trials*; online 12/29/2024.
- Martens MJ, Logan BR. Statistical rules for safety monitoring in clinical trials. *Clinical Trials*: 152-161. PMID: 37877375. 04/21/2024.
- Sun Q, Rowland BT, Chen J, Mikhaylova AV, Avery C, Peters U, Lundin J, Matise T, Buyske S, Tao R, Mathias RA, Reiner AP, Auer PL, et al. Improving polygenic risk prediction in admixed populations by explicitly modeling ancestral-differential effects via GAUDI. *Nature communications*;15(1):1016. PMID: 38310129.
- Tarima S, Flournoy N. The cost of sequential adaptation and the lower bound for mean squared error. *Statistical Papers*. December 2024;65(9):5529-5553. 12/01/2024.
- Uschner D, Sverdlov O, Carter K, Chipman JJ, Kuznetsova O, Renteria J, Lane A, Barker C, Geller NL, Proschan M, Posch M, Tarima S, et al. Using Randomization Tests to Address Disruptions in Clinical Trials: A Report from the NISS Ingram Olkin Forum Series on Unplanned Clinical Trial Disruptions. *Statistics in Biopharmaceutical*

- Research;16(4):405-413. 01/01/2024.
- Uschner D, Sverdlov O, Carter K, Chipman J, Kuznetsova O, Renteria J, Lane A, Barker C, Geller N, Proschan M, Posch M, Tarima S, et al. Rejoinder. *Statistics in Biopharmaceutical Research*;16(4):425-427.online 10/23/2024.
- Wang T, Lin CW. Using a centered general linear model for detection of interactions among biomarkers. *Statistical methods in medical research*; 33(3):414-432. PMID: 38320800. 02/07/2024.
- Yang K, Qiu P. SpTe2M: An R package for nonparametric modeling and monitoring of spatiotemporal data. *Journal of Quality Technology*;56(2):140-156. 01/01/2024.
- Yu D, Kane MJ, Koay EJ, Wistuba II, Hobbs BP. Machine learning identifies prognostic subtypes of the tumor microenvironment of NSCLC. *Scientific reports*;14(1):15004. PMID: 38951567. 07/02/2024.
- Yu D, Miao H, Wu H. Neural Generalized Ordinary Differential Equations with Layer-Varying Parameters. *Journal of Data Science*. 2024;22(1):10-24. 12/04/2024.
- Zenkova Z, Zenkov G, Musoni W, Tarima S. Estimation of Working Capital Turnover Measures on Interval Data. *Lecture Notes in Networks and Systems*;1104 LNNS:157-166. 01/01/2024.
- Zhang C, Nigo M, Patel S, Yu D, Septimus E, Wu H. Use of Real-World EMR Data to Rapidly Evaluate Treatment Effects of Existing Drugs for Emerging Infectious Diseases: Remdesivir for COVID-19 Treatment as an Example. *Statistics in Biosciences*;16(3):604-633. 12/01/2024.
- Zhou Y, Li T, Choppavarapu L, Fang K, Lin S, Jin VX. Integration of scHi-C and scRNA-seq data defines distinct 3D-regulated and biological-context dependent cell subpopulations. *Nature communications*;15 (1): 8310. PMID: 39333113.09/28/2024.

COLLABORATIVE APPLIED RESEARCH

The Division of Biostatistics provides biostatistical support for collaborative applied research through three mechanisms:

- Co-investigators on grants
- Integration contract set up with Medical College departments, division, centers, institutes, or other research programs to provide upfront integrated biostatistical support to their members
- Hourly effort recharge mechanism of the Biostatistics Consulting Service

Faculty and analysts in the Division of Biostatistics co-authored 125 medical publications in 2024 (Appendix 2). During this past year, they also provided statistical support through major grant effort or integration contracts for the following research programs and units:

- The Center for International Blood & Marrow Transplant Research (CIBMTR)
 - Resource for Clinical Investigation in Blood and Marrow Transplantation (RCIBMT)
 - Blood and Marrow Transplant Clinical Trials Network (BMT CTN)
 - National Marrow Donor Program / Be the Match
- The Medical College of Wisconsin Cancer Center
- The Clinical and Translational Science Institute
- Department of Anesthesiology
- Department of Radiation Oncology ROCKET clinical trials program
- Department of Orthopedic Surgery
- Department of Physical Medicine and Rehabilitation
- Pediatric Emergency Medicine
- Department of Pediatrics (support for genomics researchers)
- Department of Surgery
- Division of Hematology / Oncology
- Froedtert Hospital Pharmacy

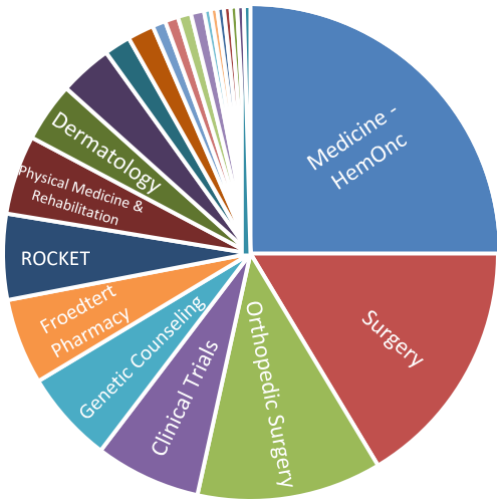
BIostatISTICS CONSULTING SERVICE

The Biostatistics Consulting Service (BCS) provides statistical support to investigators at the Medical College, its affiliates, and the public. The services provided include assistance with study design, data management, statistical analysis, interpretation of study results, and assistance in grant preparation. This pre-arranged assistance is available through the BCS on a recharge basis or through pre-arranged contacts with departments and centers as described previously.

The BCS collaborated on 232 projects in 2024, totaling 4698 hours of Biostatistics Faculty and Analyst collaboration time. Following is a breakdown of projects per MCW department or other affiliation. The BCS also provides drop-in consulting hours, similar to "faculty office hours" where staff biostatisticians designate weekly hours for investigators to receive free statistical consultations. To learn more, view the Biostatistics Consulting Service website.

Number of Biostatistics Consulting Service by Projects:

Department	Frequency	Department	Frequency	Department	Frequency	Department	Frequency
Anesthesiology	4	Genetic Counseling	14	Pathology	2	Psychiatry & Behavioral Medicine	1
Clinical Trials	16	Institute for Health & Equity	4	Pediatrics – Emergency Medicine	8	ROCKET	13
Dermatology	9	Marquette University	1	Pediatrics - Gastroenterology	2	Radiation Oncology	2
Emergency Medicine	1	Medicine	1	Physical Medicine & Rehabilitation	12	Surgery	38
External Client	1	Medicine - HemOnc	58	Plastic Surgery	1	Urologic Surgery	2
Froedtert Pharmacy	13	Orthopedic Surgery	28	Psychiatry	1		



2024 FUNDED GRANTS

Grant Title	PI	Biostatistics Member	TOTAL COSTS
NMDP - 16-NTCD Study	^Brazauskas, Ruta	Brazauskas, Ruta	\$15,719
Acute neurobehavioral predictors of risk trajectories following youth violence victimization	^Levas, Michael	Szabo, Aniko	\$849,998
BMT CTN Data and Coordinating Center	^*Horowitz, Mary; Logan, Brent	Brazauskas, Ruta; Logan, Brent; Martens, Mike	\$51,860,000
A Data Resource for Blood and Marrow Transplants and Adoptive Cellular Therapy Research	^Shaw, Bronwen	Ahn, Auer, Brazauskas, Chen, Kim, Logan, Martens, Wang, Zhang	\$32,371,311
Assessing Photoreceptor Structure and Function in Normal and Diseased Retinae	^*Carroll, Joseph	Tarima, Sergey	\$2,444,409
Rat Genome Database	^Kwitek, Anne	Ahn, Kwang Woo; Lin, Chien-Wei	\$7,731,741
Leveraging genetic mapping for personalized targeting of breast cancer microenvironment	^Joshi, Amit	Banerjee, Anjishnu	\$1,870,133
Mechanistic and therapeutic role of the CD137-CD137L axis in Type 1 Diabetes	^Chen, Yi-Guang	Lin, Chien-Wei	\$3,248,996
Randomized Study of very low versus low dose busulfan in transplant for severe combined	^Logan, Brent	Logan, Brent	\$121,362
A Phase I Clinical Trial Testing Feasibility of Hematopoietic Stem Cell Gene Therapy Using Platelet Factor VIII to Safely Improve Hemostasis for Severe Hemophilia A with Inhibitory Antibodies to FVIII	^Wilcox, David	Brazauskas, Ruta	\$7,991,821
Role of RNA activation in Tumor Progression and Metastasis	^Chaluvally-Raghavan, Pradeep	Banerjee, Anjishnu	\$1,704,781
MCW NCTN Lead Academic Participating Site	^Wong, Stuart	Logan, Brent	\$20,311,047

Effects of Head Impact Exposure During Contact Sport on Middle School and High School Athletes	^Wang, Yang	Banerjee, Anjishnu; Szabo, Aniko	\$2,963,667
A factorial randomized controlled trial of home-based self-sampling and patient educational material to increase high-resolution anoscopy attendance among individuals at increased risk for anal cancer	^*Nyitray, Alan	Rein, Lisa	\$3,737,634
Primary Immune Deficiency Treatment Consortium	^Logan, Brent	Chunara, Farheen; Dammalapati, Sravya; Liu, Xuerong	\$1,716,111
Ischemic Conditioning and Improved Motor Function Post Stroke	^Durand, Matt	Tarima, Sergey	\$911,137
Deconstructing sleep disruption as a major risk factor for relapse in opioid use	^Everson, Carol	Szabo, Aniko	\$1,598,776
The Inflammatory Index as a Biomarker for Pain in Patients with Sickle Cell Disease	^Brandow, Amanda	Szabo, Aniko; Lin, Chien-Wei "Masaki"	\$1,265,359
Clinical and Translational Science Award	^Shaker, Reza	Ahn, Kwang Woo; Brazauskas, Ruta; Logan, Brent; Sparapani, Rodney; Szabo, Aniko, Tarima, Sergey	\$20,311,047
Machine learning accelerated on-line adaptive replanning	^Eric Paulson	Mei-Jie Zhang	\$2,589,287
Prostate Cancer Radio-Pathomics for Differentiating Clinically Significant Disease	^LaViolette, Peter	Banerjee, Anjishnu	\$3,138,929
Blockade of IL-23 for the Prevention of Graft Versus Host Disease	^William Drobyski	Szabo, Aniko	\$2,193,432
Reducing innate inflammation in new onset T1D with Lactobacillus plantarum	^Hessner, Martin	Lin, Chien-Wei	\$2,772,953
Environmental Sound Recognition Before and After Cochlear Implantation in Adults	^Harris, Michael	Tarima, Sergey	\$446,199
A self-organizing embryoid model of peri-implantation human development	^Taniguchi, Kenichiro	Lin, Chien-Wei	\$1,548,658
Molecular regulators of human amniogenesis	^*Taniguchi, Kenichiro	Lin, Chien-Wei "Masaki"	\$2,826,863
Gastroschisis Outcomes of Delivery (GOOD) Study	^Szabo, Aniko; Wagner, Amy	Szabo, Aniko	\$4,230,838
Every Day Counts: A lifestyle program for women metastatic breast cancer	^Melinda Stolley	Banerjee, Anjishnu; Visotcky, Alexis; Bi Qing Teng (Michelle)	\$3,446,141
Dual Functionality of Ceramide in Human Microvascular Endothelial Function	^Freed, Julie	Tarima, Sergey	\$3,026,932

Pharmacological Jak2 inhibition to overcome androgen receptor aberrations in prostate cancer	^Nevalainen, Marja	Banerjee, Anjishnu	\$2,945,938
A longitudinal, nationally representative study of cognition-related effects of breast cancer and its treatment	^Nattinger, Ann	Laud, Purushottam	\$1,476,873
Delineating the mechanisms underlying heart valve endothelial repair	^Lincoln, Joy	Lin, Chien-Wei	\$1,719,595
Retinal Contributions to Vision Loss in Albinism	^Carroll, Joseph	Tarima, Sergey	\$2,233,406
Endothelial Rap1 in the control of heart function	^Zhang, David X.	Sparapani, Rodney; Yang, Kai	\$511,160
No-Show Prevention Practices in Dental Care Settings Serving Underserved Populations	^Szabo, Aniko	Szabo, Aniko; Teng, Bi Qing	\$291,340
Bridging Community-based Continence Promotion and Primary Care	^Neuner, Joan	Laud, Purushottam	\$1,018,565
Machine Learning to identify Biomarkers for Risk of Chronic Graft-Versus-Host Disease	^Logan, Brent	Logan, Brent; Martens, Mike	\$458,189
Neurovascular Uncoupling and Cognitive Impairments of Long COVID in Aging	^Wang, Yang	Banerjee, Anjishnu	\$1,704,781
Cerebrovascular reactivity in adults on hemodialysis and association with intradialytic cerebral hypoperfusion	^Dawn Wolfgram	Hyun, Hyun; Gao, Yan	\$234,000
Stand Up for Your Health: A Randomized Study	^Kulinski, Jacquelyn	Gao, Yan	\$2,824,501
The Role of Mortalin in Thyroid Cancer	^Park, Jong-in	Lin, Chein-Wei	\$2,096,576
Evaluating the Impact of Singing Interventions on Markers of Cardiovascular Health in Older Patients with Cardiovascular Disease	^Kulinski, Jacquelyn	Sparapani, Rodney; Visotcky, Lexi	\$991,980
Deglutitive and airway protective functions of proximal/ striated muscle esophagus in health and disease	^Shaker, Reza	Szabo, Aniko	\$1,872,713
Exploring Age Differences in Patient Reported Cognitive Function Trajectories among Hematopoietic Stem Cell Transplant and Chimeric Antigen Receptor T-cell patients and Linking Two Key	^Cusatis, Rachel	Brazauskas, Ruta	\$429,000

Measures			
The roles of Lyme spirochete adhesins in hematogenous dissemination	^Jenifer Coburn	Hyun, Noorie; Gao, Yan	\$3,524,778
The histone demethylase JMJD1C in human acute myeloid leukemia	^Tarima, Sergey	Tarima, Sergey	\$16,533
Polygenic risk scores and health disparities: the role of blood cells immune response and evolutionary adaptation	^Auer, Paul	Auer, Paul	\$492,621
Prognostic implications of mitochondrial inheritance in myelodysplastic syndromes after stem-cell transplantation	^Dong, Jing	Auer, Paul	\$783,000
Innovative approaches to elucidate the genetic etiology of age-related hearing impairment and tinnitus	^Auer, Paul	Farazi, Manzur Rahman	\$334,918
Understanding Breast Cancer Risk and Screening in Transgender Persons through a Pilot Breast Cancer Screening Program	^Cortina, Chandler	Brazauskas, Ruta	\$1,052,128
Defining GATA4's Molecular Function in Gastric Cell Biology	^Battle, Michelle	Tarima, Sergey	\$2,289,308
Next generation functional genomics of hematology traits	^Paul Auer	Paul Auer	\$145,162
Host-Pathogen Dynamics in Leptospirosis, Project 3: Invasion Dynamics	^Coburn, Jenifer	Gao, Yan	\$1,556,100
Spinal cord structure-function relationships in degenerative cervical myelopathy	^Vedantam, Aditya	Banerjee, Anjishnu	\$2,574,623
Early diagnosis of light chain amyloidosis	^D'Souza, Anita	Sparapani, Rodney; Chunara, Farheen	\$1,495,747
BMTCTN Protocol 1705 CSL Behring	^Martens, Michael	Martens, Michael	\$243,750
A Phase 3, Randomized, Open-Label, Multicenter Study, to Compare T-Guard to Ruxolitinib for the Treatment of Patients with Grade III or IV Steroid-Refractory Acute Graft-Versus-Host D	^Martens, Michael	Martens, Michael	\$74,743
Defining the mechanisms of surgical site infection after oral cancer surgery using peri-operative metagenomics	^*Zenga, Joseph	Lin, Chien-Wei	\$442,440
BAA - Mitigation of Multi-organ Delayed Effects of Acute Radiation Exposure (DEARE) with ACE-inhibitor Lisinopril	^Himburg, Heather	Szabo, Aniko	\$3,369,046
Control of GVHD by Probiotics with individual Commensal Bacteria	^Yu, Xue-Zhong	Lin, Chien-Wei; Jin, Victor	\$2,430,251
Determining the role of the SDF-1/CXCR4 pathway and its intersection with chronic stress to establish novel precision	^Zenga, Joseph	Banerjee, Anjishnu	\$403,090

approaches to head and neck cancer management			
Omics analysis of three-dimensional transcriptional regulation	^Jin, Victor	Jin, Victor; Fang, Kun; Choppavarapu, Lavanya	\$928,682
Structural Variation and Hematological Traits	^Auer, Paul	Ma	\$238,187
Blood Flow Regulation and Neuromuscular Function Post-Stroke	^Durand, Matt	Tarima, Sergey	\$3,656,070
Stem Cell Therapeutic Outcomes Database (SCTOD)	^Rizzo, Douglas J.	Ahn, Kim, Logan, Wang, Zhang	\$29,423,676
NMDP / Office of Naval Research	^Tao Wang	Tao Wang	\$746,373
17-CSIDE-NMDP	^Logan, Brent	Logan, Brent	\$15,000
17-CD33CAR- NMDP	^Brazauskas, Ruta	Brazauskas, Ruta	\$29,383
Robust estimators for missing covariate parameters for right-censored data	Kim, Soyoung	Ahn, Kwang Woo; Kim, Soyoung	\$200,000
Targeting oncogenomic function of N-Myc to inhibit neuroendocrine prostate cancer visceral metastasis	^Jin, Victor	Jin, Victor	\$135,000
Chemotherapy Dosing in Patients With Obesity: Are Oncologists Optimally Balancing Risks and Benefits to Avoid Overtreatment and Undertreatment?	^Neuner, Joan	Sparapani, Rodney	\$1,046,468
Chronic sleep deficiency as a cause of bone loss in aging	^*Everson, Carol	Szabo, Aniko	\$2,385,081
POINT-mTBI: Prospective Study of Point-of-Care Blood-Based Biomarkers in Acute Military, Civilian, and Sport-Related Mild Traumatic Brain Injury (mTBI)	^McCrea, Michael	Tarima, Sergey; Rein, Lisa	\$6,403,731
Impact of the COVID-19 Pandemic on Help Seeking of American Indian and Black Women Experiencing Intimate Partner Violence	^Williams, Joni	Yu, Duo	\$277,690
Targeting MED31-driven transcription recycling in lethal prostate cancer	^Jin, Victor	Jin, Victor; Fang, Kun	\$440,106
MCW CIC Center Grant: Working towards health equity in injury prevention	^*deRoos Cassini, Terri	Tarima, Sergey	\$4,636,017
Addressing key social-structural risk factors for racial disparities in maternal morbidity in Southeastern Wisconsin	^Palatnik, Anna	Tarima, Sergey	\$10,231,511
Therapeutic Targeting of Minimal Residual Disease to Improve Outcomes in Multiple Myeloma	Mohan, Meera	Szabo, Aniko	\$537,380

OOD PPG: Center for Aphasia Research and Recovery	Binder, Jeffrey	Szabo, Aniko	\$250,000
OOD PPG: Mechanistic studies of chemokine biology in exocrine pancreas disease	Dwinell, Michael	Auer, Paul	\$250,000
CardioWatch: an omics-based prediction assay for cardiac late effects of acute radiation exposure	^Himburg, Heather	Szabo, Aniko; Kim Soyoung	\$289,998
Multi-cohort validation of machine learning radiogenomic models (ML-RGx) to predict late toxicity in prostate cancer	^*Kerns, Sarah	Auer, Paul	\$2,981,502
PTPN22 controls the interrelationship of IL-21+ and FOXP3+ CD4 T cells in T1D	^*Chen, Yi-Guang	Lin, Chien-Wei	\$418,000
Human Coronary Artery Plaque Transcriptomes and Cardiovascular Risk Assessment	^*Widlansky, Michael	Wang , Tao	\$2,678,152
Mechanism of Chemotherapy Induced Microvascular Dysfunction in Cancer Survivors	^*Beyer, Andreas	Sparapani, Rodney	\$3,409,842
PRESERVE I - NMDP	^Brazauskas, Ruta	Brazauskas, Ruta	\$24,999
Improving in-hospital and post-discharge patient education for mild traumatic brain injury (HSRA)	^*Nelson, Lindsay	Tarima, Sergey	\$2,289,304
RIGERR: Resources for Investigating Genetic and Epigenetic Regulation of Renal Disease	^Geurts, Aron	Auer, Paul	\$465,411
Puerto Rican Obesity Intervention for Men	^Sanchez-Johnsen, Lisa	Auer, Paul; Conrardy, Ryan	\$946,314
Neuroinflammation and motor neuron loss in SMA	^Ebert, Allison	Lin, Chien-Wei "Masaki"	\$565,054
Molecular Markers for Tumors Associated with Extrachromosomal HPV	^Ojesina, Akinyemi	Auer, Paul	\$2,893,516
FY24 C-MACC Funding	Burke, Michael	Martens, Mike; Szabo, Aniko	\$1,004,203
Sex-differences in ACE2 Regulate Normal Tissue Toxicity During Gastrointestinal Acute Radiation Syndrome Himburg, Heather	^* Himburg, Heather	Szabo, Aniko	\$1,607,098
Assessing functional improvements with use of the SPIO Core-Max Expedition TLSO	^Stibb, Stacy	Tarima, Sergey	\$0
GATA2-TGF 1-TAL1 pathway as a critical mediator of NK Cell development	^*Malarkannan, Subramaniam	Tarima, Sergey	\$3,689,379

Microvascular complications in sickle cell disease: assessment and treatment implications	^*Argote, Juliana Alvarez	Tarima, Sergey	\$50,000
Primary Immune Deficiency Treatment Consortium (PIDTC): A resource to drive scientific and clinical advances related to the treatment of inborn errors of immunity	^*Dvorak, Chris	Brazauskas, Ruta; Sravya Gethika Dammalapati; Logan, Brent; Liu, Xuerong	\$1,500,000
CSIDE Trial-UO1 Submission	^*Broglie, Larisa	Logan, Brent	\$244,997
Role of Liver Kinase B1 in the decreased angiogenesis in bronchopulmonary dysplasia	^*Konduri, Girija Ganesh	Lin, Chien-Wei	\$2,581,800
Phase II trial of interferon-gamma and donor lymphocyte infusion for relapsed myeloid malignancies after allogeneic stem cell transplantation	^*Page, Kristin	Kim, Soyoung	\$243,363
Genetic and Epigenetic Mechanisms of BP Regulation - Project 1	Geurts, Aron	Auer, Paul	\$138,700
Automating myocardial infarction diagnosis by ECGs with VERITAS software and hybrid learning	*Sparapani, Rodney	Sparapani, Rodney	\$50,000
Identification of Targeted Treatments for Adult-Type Granulosa Cell Tumors of the Ovary (AGCT) through I-depth multi-omics analysis	*Hopp, Elizabeth	Banerjee, Anjishnu	\$458,577
Single-cell identification of neo-antigen specific T cells in oral cancer	^Zenga, Joseph	Jin, Victor	\$30,000
NMDP: BMT CTN Mesoblast Protocol Development Project	^Brazauskas, Ruta	Brazauskas, Ruta	\$28,438
Strategic Investments to Bridge the Gaps in Prevention and Care to Reduce Inequities in Cancer	*Young, Staci	Banerjee, Anjishnu	\$4,819,477
IPW-5371 Fumarate Efficacy in Female WAG/RijCmcr Rats	^*Himburg, Heather	Szabo, Aniko; Kim Soyoung	\$590,455
FY25 C-MACC Funding	^*Burke, Michael	Martens, Michael	\$901,755
Using computer vision to screen for Degenerative Cervical Myelopathy	^*Raju, Viprav	Banerjee, Anjishnu	\$50,000
Exploiting Synthetic Lethality: Inducing 'BRCAness' in Non-BRCA2 Deficient Cancers to Enhance PARP Inhibitor Responses	^*De Sarkar, Navonil	Banerjee, Anjishnu	\$40,000

External Funds	\$320,394,488
New Grants	\$96,936,145
2024 Total of All Grants	\$328,102,825

* Denotes New Grants | ^ Denotes External Funding

APPENDIX 1: METHODOLOGIC PRESENTATIONS

Chen, Zhongyuan. Data-guided statistical methods for treatment recommendation conference, Joint Statistical Meetings, Portland. 08/05/2024. (in-person invited talk).

Duo Yu, Meilin Huang, Michael J. Kane, Brian P. Hobbs. A Patient Similarity-embedded Bayesian Approach to Prognostic Biomarker Inference with Application to Thoracic Cancer Immunity, University of Texas Health Science Center at Houston, School of Public Health Reuel A. Stallones Building. 11/15/2024 – 11/16/2024. (in-person invited talk).

Kai Yang, Reduced-Rank Cox Models for High-Dimensional Multi-Response Survival Data with Hidden Confounders, INFORMS Annual Meeting, Seattle, Washington, 10/20/2024 - 10/23/2024. (in-person invited talk).

Monika Tutaj, Anne Kwitek, Cross-species Epigenomic Maps of Intergenic Loci for Hypertension and Blood Pressure, Chicago, Hypertension Scientific Session 2024, 09/06/2024. (in-person invited talk).

Rodney Sparapani, Antonio Linero, Robert McCulloch. Ensemble learning with Bayesian Additive Regression Trees. International Society for Bayesian Analysis World Meeting. Venice, Italy. 07/01/2024 – 07/07/2024. (Sparapani presented in-person).

Yu Wang, Kwang Woo Ahn, Yi-Guang Chen. FastQDesign: A realistic FASTQ-based framework for ScRNA-seq study design issues. National Yang Ming Chiao Tung University, Taiwan. 12/20/2024. (in-person invited talk).

APPENDIX 2: COLLABORATIVE PAPERS & PUBLICATIONS

- Ahmed, G., Alsouqi, A., Szabo, A., Samples, L., Shadman, M., Awan, F. T., Rojek, A. E., Riedell, P. A., Iqbal, M., et al. CAR T-cell therapy in mantle cell lymphoma with secondary CNS involvement: A multicenter experience. *Blood Advances*, 8(13), 3528-3531. PMID: 38701405. 05/03/2024.
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- Alsouqi, A., Ahmed, G., Wang, J., Cassanello, G., Szabo, A., Rojek, A. E., Riedell, P. A., Awan, F., Samples, L., et al. (2024). Chimeric antigen receptor T-cell therapy in secondary central nervous system lymphoma: A multicenter analysis. *American Journal of Hematology*, 99(8), 1624-1627. PMID: 38769663. 05/21/2024.
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- Ballen K, Wang T, He N, Knight JM, Hong S, Frangoul H, Verdonck LF, Steinberg A, Diaz MA, et al. Impact of Race and Ethnicity on Outcomes After Umbilical Cord Blood Transplantation. *Transplantation and Cellular Therapy*; 30(10):1027.e1-1027.e14. PMID 39033978. 07/22/2024.
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