Rebecca A. Deek

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EDUCATION

2023 **University of Pennsylvania**
Perelman School of Medicine
PhD Candidate in Biostatistics
Dissertation Advisor: Hongzhe Li
Committee: Mingyao Li (Chair), Jing Huang, and Ronald G. Collman

2018 **Columbia University**
Mailman School of Public Health
MS in Biostatistics

2016 **New Jersey Institute of Technology and Rutgers University**
Albert Dorman Honors College
BS in Biological Sciences

RESEARCH EXPERIENCE

2018– **Research Assistant**
Department of Biostatistics, Epidemiology, and Informatics
Perelman School of Medicine
University of Pennsylvania, USA
Advisor: Hongzhe Li

2017–2018 **Research Assistant**
Department of Natural Sciences
School of Arts and Sciences
Lebanese American University, Lebanon
Advisors: Pierre Zalloua and Georges Khazen

2016–2018 **Research Assistant**
Department of Computer Science
Ying Wu College of Computing
New Jersey Institute of Technology, USA
Advisor: Zhi Wei

2014–2016 **Research Assistant**
Department of Biological Sciences
College of Science and Liberal Arts
New Jersey Institute of Technology, USA
Advisors: Jorge Golowasch and Casey Diekman (Supported by NSF REU)

2013–2014 **Research Assistant**
John A. Reif, Jr. Department of Civil & Environmental Engineering
Newark College of Engineering
New Jersey Institute of Technology, USA
Advisor: Taha Marhaba

PUBLICATIONS

† indicates equal contribution

PEER-REVIEWED ARTICLES

In Review **Deek, R.A.** and Li, H. (2022). Mixture Margin Random-effects Copula Models for Inferring Temporally Conserved Microbial Co-variation Networks from Longitudinal Data. *Under Review in Annals of Applied Statistics.* preprint: doi.org/10.1101/2022.04.25.489333.

Deek, R.A. and Li, H. (2022). Inference of Microbial Co-variation Networks Using Copula Models with Mixture Margins. *Under review in Biometrics.* preprint: doi.org/10.48550/arXiv.2111.02344

Duan, H., Ren, J., Wei, S., Li, C., Wang, Z., Li, M., Wei, Z., Jiang, Y., Wu, S., Hu, W., Guo, C., Zhang, X., Liang, L., Yu, C., Mou, Y., Liu, Y., Li, H., Sugarman, E., **Deek, R.A.**, Chen, L., Chen, Y., Yao, M., Liu, L., Zhang, G., and Mou, Y. (2022) Multi-omic Characterization of Lung Cancer Brain Metastasis Reveals the Metabolic Venerability as a Novel Therapeutic Target. *Under Review in Nature Communications.*

Sutera, P.†, Deek, M.P.†, **Deek, R.A.**, Guler, O.C., Hurmuz, P., Reyhan, M., Rowe, S., Radwan, N., Dipasquale, S., Hrinivich, W.T., Lowe, K., Ren, L., Saraiya, B., Ennis, R., Hathout, L., Mayer, T., Song D.Y., Kiess, A., Oymak, E., Pienta, K.P., Feng, F., Pomper, M., Ozyigit, G., Tran, P.T., Onal, C., Phillips, R.M. Prostate-specific membrane antigen PET response associates with metastasis-free survival following stereotactic ablative radiation therapy in oligometastatic castration-sensitive prostate cancer. *Under review in JAMA Oncology.*

McGinniss, J.E., Whiteside, S.A., **Deek, R.A.**, Simon-Soro, A., Graham-Wooten, J., Oyster, M., Brown, M., Cantu, E., Diamond, J.M., Lee, H., Christie, J.D. Bushman, F.D. and Collman, R.G. (2022). Primary graft dysfunction is associated with Prevotella-enriched allograft microbiome, elevated pepsin, and a hyper-inflammatory immune response at the time of lung transplantation. *Under review in American Journal of Respiratory and Critical Care Medicine.*

2022 Deek, M.P.†, Van der Eecken, K.†, Sutera, P., **Deek, R.A.**, Mendes, A.A., Kiess, A., Phillips, R., Mishra, M., Rana, Z., Hailun, W., Antonarakis, E.S., Song, D.Y., DeWeese, T., Paller, C.J., Feng, F.Y., Wyatt, A., Pienta, K.J., Lotan, T.L., Ost, P. and Tran, P.T. (2022). Long Term Outcomes and Genetic Predictors of Response to Metastasis Directed Therapy Versus Observation in Oligometastatic Castration-Sensitive Prostate Cancer: A Pooled Analysis of the STOMP and ORIOLE Trials. *Journal of Clinical Oncology*. doi:10.1200/JCO.22.00644.

Wei, S., Yin, D., Yu, S., Lin, X., Savani, M., Du, K., Ku, Y., Wu, D., Li, S., Liu, H., Tian, M., Chen, Y., Bowie, M., Hariharan, S., Waitkus, M., Keir, S., Sugarman, E., **Deek, R.A.**, Labrie, M., Khasraw, M., Lu, Y., Mills, G., Herlyn, H., Wu, K., Liu, L., Wei, Z., Flaherty, K., Abdullah, K., Zhang, G., and Ashley D. (2022). Anti-tumor Activity of a Mitochondrial Targeted HSP90 Inhibitor in Gliomas. *Clinical Cancer Research*. doi:10.1158/1078-0432.ccr-21-0833

2021 **Deek, R.A.** and Li, H. (2021). A Zero-Inflated Latent Dirichlet Allocation Model for Microbiome Studies. *Frontiers in Genetics*, 11, 1844. doi:10.3389/fgene.2020.602594.

2019 **Deek, R.**†, Nasser, J.†, Ghanem, A.†, Mardelli, M.†, Khazen, G., Salloum, A.K., Abchee, A., Ghassibe-Sabbagh, M. and Zalloua, P. (2019). Genome-wide association analysis of HDL-C in a Lebanese cohort. *PloS one*, 14(6). doi:10.1371/journal.pone.0218443.

2018 Chen, J.†, King, E.†, **Deek, R.**†, Wei, Z., Yu, Y., Grill, D. and Ballman, K. (2018). An omnibus test for differential distribution analysis of microbiome sequencing data. *Bioinformatics*, 34(4), 643-651. doi:10.1093/bioinformatics/btx650.

PEER-REVIEWED CONFERENCE PROCEEDINGS

2015 **Deek, R.** (2015). Lessons From Nature: Defensive Designs for the Built Environment. In *5th International Conference on Building Resilience*.

NON-REFEREED ARTICLES

2015 **Deek, R.** (2015). Modeling Human Body Functions through Biorobotics. In *Technology Observer Magazine*, 15/16(1): 52-54 (references, p. 59).

2014 **Deek, R.** (2014). Mimicking the Femur Bone to Improve Resiliency of Built Structures In *Technology Observer Magazine*, 14/15(1): 24-26 (references, p. 50).

PRESENTATIONS

TALKS

2022 **Deek, R.A.**, Li, H. "Mixture Margin Random-Effects Copula Models for Conserved Microbial Co-variations." JSM 2022. Washington, DC, USA. August 2022.

[Invited] Deek, R.A., Li, H. "Microbial Co-variation Discovery using Mixture Margin Copula Models." IMS 2022. London, UK. June 2022.

[Invited] Deek, R.A., "Inferring Microbial Co-occurrence from Genomic Sequencing Data." NIEHS BCBB Seminar. Research Triangle, NC, USA. April 2022.

Deek, R.A., Li, H. "Inference for Temporally Conserved Microbial Interactions Using Mixture Margin Copulas." ENAR 2022. Houston, TX, USA. March 2022.

2021 **Deek, R.A.**, Li, H. "Copula Models for Temporally Conserved Microbial Interactions." JSM 2021. Seattle, WA, USA. (Virtual due to COVID-19). August 2021.

Deek, R.A., Li, H. "Mixed Margin Copula Models for Microbial Interactions." ENAR 2021. Baltimore, MD, USA. (Virtual due to COVID-19). March 2021.

2020 **Deek, R.A.**, Li, H. "Zero-Inflated Topic Models for the Analysis of Microbiome Data." ENAR 2020. Nashville, TN, USA. (Virtual due to COVID-19). March 2020.

ABSTRACTS

2022 **Deek, R.A.**, Li, H. "Inference for Conserved Microbial Co-variations Using Mixture Margin Random-effects Copula Models." Penn Conference on Big Data in Biomedical and Population Health Sciences. Philadelphia, PA, USA. September 2022.

Zhao, F.R., **Deek, R.A.**, Garifallou, J., Jalaly, J., Lin, C., Reed, D., Banerjee, S., Amudala, N., Sreih, A., Chou, S., Livolsi, V., Collman, R., Lee, H., Merkel, P., Grayson, P., Cohen, N., Miner, J., Rhee, R. "Nasal Epithelial Gene Expression Profiling Preceding Relapse in Patients with Granulomatosis with Polyangiitis." ACR 2022. Philadelphia, PA, USA. November 2022.

Rana, Z., Eggleston, C., Baker, K., Molitoris, J.K., Ferris, M.J., Patel, A.N., Kwok, Y., Deek, M.P., P. Sutera, P., **Deek, R.A.**, Bentzen, S.M., Siddiqui, M., Mannuel, H., Hussain, A., Tran, P.T., and Mishra M.V. "Phase 2 randomized Total Eradication of metastatic lesions following definitive Radiation to the Prostate in de novo oligometaStatic prostate cancer (TERPs) trial." ASTRO 2022. San Antonio, TX, USA. October 2022.

Deek, M.P., Van der Eecken, K., Sutera, P., **Deek, R.A.**, Fonteyne, V. Mendes, A.A., Lumen, N., Phillips, R., Delrue, L., Verbeke, S., De Man, K., Song, D.Y., Paller, C.J, Steven Joniau, S., De Meerleer, G., Lotan, T.L, Berlin, A., Siva, S., Ost, P., Tran, P.T. "Long Term Outcomes and Genetic Predictors of Response to Metastasis Directed Therapy Versus Observation in Oligometastatic Castration-Sensitive Prostate Cancer: A Pooled Analysis of the STOMP and ORIOLE Trials." ASTRO 2022. San Antonio, TX, USA. October 2022.

Deek, M.P., Van der Eecken, K., Sutera, P., **Deek, R.A.**, Fonteyne, V. Mendes, A.A., Lumen, N., Phillips, R., Delrue, L., Verbeke, S., De Man, K., Song, D.Y., Paller, C.J, Steven Joniau, S., De Meerleer, G., Lotan, T.L, Berlin, A., Siva, S., Ost, P., Tran, P.T. "Long Term Outcomes and Genetic Predictors of Response to Metastasis Directed Therapy Versus Observation in Oligometastatic Castration-Sensitive Prostate Cancer: A Pooled Analysis of the STOMP and ORIOLE Trials." ASCO 2022. Chicago, IL, USA. June 2022.

McGinniss, J.E., Whiteside, S.A., **Deek, R.A.**, Simon-Soro, A.S., Brown, M., Cantu, E., Lanfranco, A.R., Haas, A., Diamond, J.M., Lee, H., Christie. J.D., Bushman, F.D., Collman, R.G. "Longitudinal Analysis of the Lung Microbiome and Chronic Lung Allograft Dysfunction After Transplant." ATS 2022. San Francisco, CA. May 2022.

2021 McGinniss, J.E., **Deek, R.A.**, Simon-Soro, A.S., Whiteside, S.A., Graham-Wooten, J.N., Cantu, E., Brown, M., Diamond, J.M., Lee, H., Christie. J.D., Bushman, F.D., Collman, R.G. "Oral taxa enriched lung microbiome associates with increased pepsin and a hyperinflammatory phenotype in primary graft dysfunction after lung transplantation." ATS 2021. (Virtual due to COVID-19). May 2021.

2020 **[Invited] Deek, R.A.**, Li, H. "Methods for Inference of Microbial Interactions Using Copula Models with Mixture Margins." JSM 2020. (Virtual due to COVID-19). Philadelphia, PA, USA. August 2020.

OPEN-SOURCE SOFTWARE

2020 **zinLDA** – Package Website
An R package for MCMC implementation of zero-inflated latent Dirichlet allocation models for microbiome studies.
Creator and core developer.

TEACHING EXPERIENCE

Fall 2020 **Teaching Assistant**, BSTA 630: Statistical Methods and Data Analysis I
University of Pennsylvania

Spring 2020 **Teaching Assistant**, BIOM 611: Statistical Methods for the Design and Analysis of Experiments
University of Pennsylvania

Spring 2018 **Curriculum Developer**, P8180: Relational Databases and SQL Programming for Research and Data Science
Columbia University

Fall 2017 **Teaching Assistant**, P8130: Biostatistical Methods I
Columbia University

ACADEMIC SERVICE & AFFILIATIONS

REFEREE

BMC Medical Research Methodology – Statistica Sinica

COMMITTEES

2020–2022 **Student member**, Curriculum Committee
Graduate Group in Epidemiology and Biostatistics, University of Pennsylvania.

MEMBERSHIPS

American Statistical Association (ASA)
International Biometric Society, Eastern North American Region (ENAR)
Institute of Mathematical Statistics (IMS)

LEADERSHIP

2014–2016 **Albert Dorman Honors College Newsletter**
Albert Dorman Honors College - NJIT
Co-Editor

2013–2016 **Technology Observer Magazine**
Albert Dorman Honors College - NJIT
Staff Writer

AWARDS & HONORS

2016–2018 Columbia University Hu Family Scholarship

2016 NJIT President's Medal for **Academic Excellence**

2016 NJIT Albert Dorman Honors College Outstanding Honors **Research Award**

2015 NJIT Albert Dorman Honors College **Leadership Service Award**

2013–2016 NJIT Albert Dorman Honors College Full Scholarship

SKILLS

R – Rcpp – Python – git – SQL – LaTeX

REFERENCES

Hongzhe Li, Ph.D.
Perelman Professor of Biostatistics, Epidemiology and Informatics
Vice Chair of Research Integration
Director, Center for Statistics in Big Data
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Mingyao Li, Ph.D.
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Chair, Graduate Program in Biostatistics
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Zhi Wei, Ph.D.
Professor of Computer Science
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