

# 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* preprint: [doi.org/10.1101/2022.04.25.489333](https://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* preprint: [doi.org/10.48550/arXiv.2111.02344](https://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 Vulnerability as a Novel Therapeutic Target. *Under Review*

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*

2022 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. *American Journal of Respiratory and Critical Care Medicine*. doi:[10.1164/rccm.202112-2786OC](https://doi.org/10.1164/rccm.202112-2786OC)

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](https://doi.org/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*, 28(10), 2180-2195. doi:[10.1158/1078-0432.ccr-21-0833](https://doi.org/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](https://doi.org/10.3389/fgene.2020.602594).
- 2019 **Deek, R.**<sup>†</sup>, Nasser, J.<sup>†</sup>, Ghanem, A.<sup>†</sup>, Mardelli, M.<sup>†</sup>, 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](https://doi.org/10.1371/journal.pone.0218443).
- 2018 Chen, J.<sup>†</sup>, King, E.<sup>†</sup>, **Deek, R.**<sup>†</sup>, 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](https://doi.org/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. (Best Poster Award).

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., Manuel, 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

- 2022           **Best Poster Award** at Penn Conference on Big Data in Biomedical and Population Health Sciences.
- 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 – L<sup>A</sup>T<sub>E</sub>X