Approved by the Regents
May 19, 2022

PROMOTION RECOMMENDATION
The University of Michigan
School of Public Health
Department of Biostatistics

Li Gen, assistant professor of biostatistics, Department of Biostatistics, School of Public Health, is recommended for promotion to associate professor of biostatistics, with tenure, Department of Biostatistics, School of Public Health.

Academic Degrees:

Ph.D.	2015	University of North Carolina, Interdisciplinary Statistics and Operations Research, Chapel Hill, NC
B.S.	2010	Beijing Normal University, Mathematical Statistics, Beijing, China

Professional Record:

2021 – Present	John G. Searle Assistant Professor, Department of Biostatistics, University of Michigan, Ann Arbor, MI
2020 – Present	Assistant Professor, Department of Biostatistics, University of Michigan, Ann Arbor, MI
2015 – 2020	Assistant Professor, Department of Biostatistics, Columbia University, New York, NY
2014 – 2014	Visiting Scholar, Department of Statistics, Texas A&M University, College Station, TX
2013 – 2013	Intern, Bell Labs, Murray Hill, NJ

Summary of Evaluation:

Teaching: Since his arrival in 2020, Professor Li has taught one advanced doctoral course during the winter semester of 2021, Advanced Topics in Computational Statistics (BIOSTAT815). He redesigned the class and received excellent teaching scores (Q1: 4.8; Q2: 4.9). He has also taught a number of graduate-level classes in biostatistics at Columbia University prior to his arrival at the University of Michigan, with generally high teaching evaluations. Professor Li has mentored three Ph.D. students while at Columbia University and supervised 27 master's students. He is currently advising one Ph.D. candidate and two master's students in the Department of Biostatistics, as well as co-advising graduate students in the Department of Statistics through the Microbiome Data Analysis Working Group.

Research: Professor Li's primary research interest involves the development of novel statistical methods for high-dimensional and complex biomedical data, including dimension reduction, association analysis, network analysis, and cluster analysis of multi-way/multi-view data with heterogeneous data types. He has applied his biostatistical work in two areas of investigation, microbiome data analysis and multi-view data integration. In the field of microbiome research, he has developed a novel zero inflated Poisson factor model to characterize the intrinsic low-rank structure of microbiome read counts, devised new regression models to leverage longitudinal microbial measurements and their association with health outcomes, and created new methods building an innovative analytical paradigm for microbiome compositional data. With regard to multi-view data integration, such as data derived from –omics studies, Professor Li has worked on novel methods for the association analysis of two multivariate datasets with potentially heterogeneous data types. He is also developing novel tensor methods for multi-view data integration, partially motivated by the National Institutes of Health (NIH) Common Fund's

Genotype-Tissue Expression (GTEx) project, where he has been a consortium member since its beginning. Finally, he has worked on Expression Quantitative Trait Loci (eQTL) analysis, which is aimed at identifying SNPs associated with the expression level of one or more genes.

Since 2015, Professor Li has a total of 57 publications in peer-reviewed journals, as well as one book chapter. Of these, 13 are first- or senior authored, and he has published 24 papers since 2020. Many of his publications are in the leading, high-impact scientific journals in the field of biostatistics, such as *Biometrics* and the *Journal of the American Statistical Association*. He has also co-authored papers published in leading clinical journals, such as the *Journal of Urology*, and as part of the large GTEx Consortium, he was a co-author on three papers published in *Science* and *Nature*. A total of nine of his papers involved a current or previous advisee. Professor Li is currently funded as a principal investigator by a R01 award from the NIH/ National Human Genome Research Institute (NHGRI). In the past, he has been supported by a R03 as a multi-principal investigator from the National Institute of Dental and Craniofacial Research (NIDCR), and as a co-investigator on a R01 (NIH/NHGRI) and a U01 (NIH/National Center for Advancing Translational Sciences (NCATS)), both while still at Columbia University. He has also received several smaller awards from private sources. Overall, Dr. Li's publication record is very strong, and his active and well-funded research program should enable him to maintain a high degree of productivity in the future.

Recent and Significant Publications:

Tianchen, X., Demmer, R.T., Li, G. (2021). Zero-inflated Poisson factor model with appli-cation to microbiome read counts. *Biometrics*, 77(1): 91-101.

Li, G. (2020). Generalized co-clustering analysis via regularized alternating least squares. *Computational Statistics & Data Analysis*, 150: 106989.

Li, G., Liu, X., Chen, K. (2019). Integrative multi-view regression: bridging group-sparse and low-rank models. *Biometrics*, 75(2): 593-602.

Li, G., Gaynanova, I. (2018). A general framework for association analysis of heterogeneous data. *The Annals of Applied Statistics*, 12(3): 1700-1726.

Li, G., Shabalin, A.A., Rusyn, I., Wright, F.A., Nobel, A.B. (2018). An empirical Bayes approach for multiple tissue eQTL analysis. *Biostatistics*, 19(3): 391-406.

Service: Professor Li has committed himself to providing excellent service to his department, the School of Public Health, and his field of research more generally. In terms of internal service, Professor Li serves on the Candidacy Committee and the Health Data Science Committee in the Department of Biostatistics. He is also a member of the School of Public Health Junior Faculty Advisory Board. In terms of his service to the broader academic community, he has performed more than 60 peer reviews for a total of 26 different scientific journals and has recently joined the Editorial Board of Biometrics as an associate editor. He has also served on three NIH special review panels and has regularly participated in reviews at professional meetings and organizations. He has also organized and chaired sessions at various professional organizations (Eastern North American Region, Joint Statistical Meetings, and International Symposium on Computer Architecture).

External Reviewers:

Reviewer A: "This (multi-view data analysis) is, I think, some of the most important work in biostatistics right now…Instead, I think the truly impressive aspect of his work is the mixture of these directions of research together. This is tremendously challenging and Dr. Li excels at it."

Reviewer B: "Dr. Li has made excellent scholarly contributions both to the methods and applied areas appropriate to a school of public health…Dr. Li's record in scholarly work including

methodological research and applied contributions (...), would make him an excellent candidate for promotion at my institution within our Biostatistics Program to the Associate Professor level in our Professor Track."

Reviewer C: "His research in this area and his recent NIH grants on these topics have shown that he has become an independent researcher and has a strong ability of identifying and solving statistical problems with important scientific impacts…I therefore strongly support Dr. Li's promotion to Associate Professor with tenure."

Reviewer D: "Gen, in my opinion, is a top researcher, whom I can confidently rank among the top 5% of faculty of his age in all the U.S. statistics and biostatistics departments. Therefore, I support his promotion case wholeheartedly."

Reviewer E: "He has established himself as an international leader in developing integrative statistical models for multi-way data, especially multiplatform genomics data, with special focus on supervised decompositions and general decompositions for disparate data types, and is clearly qualified for promotion to associate professor with tenure…His work is consistent high quality, involving deep mathematically thought out methods, practical and efficient computational algorithms, ability to handle complexities of high dimensional data, and engaging with the subject matter areas in molecular biology."

Reviewer F: "He is becoming a leader in the area of methods development for genetics and genomics data, and, in my view, clearly deserving of this promotion. He has made significant contributions to a wide spectrum of research in statistical genetics; he has developed methods that solve important problems in genetic variation and gene expression, microbiome, and integration of data from various genomics platforms."

Reviewer G: "Dr. Li developed a novel and unified framework for the association analysis for high dimensional and non-Gaussian data from the exponential family distribution. This work will make significant impacts on a wide range of applications in biomedical studies…Therefore, I support his promotion in the strongest possible terms."

Summary of Recommendation: Professor Li is an actively engaged cross-disciplinary researcher in high dimensional and complex biomedical data analysis, including dimension reduction, cluster analysis, and important bioinformatics research on microbiome data analysis and multi-modal data integration. He is a highly valued teacher, mentor, and member of the school, university, and professional communities. It is with the support of the School of Public Health Executive Committee that I recommend Gen Li for promotion to associate professor of biostatistics, with tenure, Department of Biostatistics, School of Public Health.

F. DuBois Bowman, Ph.D.
Dean, School of Public Health

May 2022