

PROMOTION RECOMMENDATION  
THE UNIVERSITY OF MICHIGAN  
MEDICAL SCHOOL  
DEPARTMENT OF COMPUTATIONAL MEDICINE AND BIOINFORMATICS  
DEPARTMENT OF HUMAN GENETICS

Stephen C. J. Parker, Ph.D., assistant professor of computational medicine and bioinformatics, Department of Computational Medicine and Bioinformatics, and assistant professor of human genetics, Department of Human Genetics, Medical School, is recommended for promotion to associate professor of computational medicine and bioinformatics, with tenure, Department of Computational Medicine and Bioinformatics, and associate professor of human genetics, without tenure, Department of Human Genetics, Medical School.

Academic Degrees:

Ph.D.	2009	Boston University, Boston, MA
M.S.	2000	East Carolina University
B.S.	1998	East Carolina University

Professional Record:

2014 – present	Assistant Professor of Computational Medicine and Bioinformatics University of Michigan
2014 – present	Assistant Professor of Human Genetics, University of Michigan
2009	Bioinformatics Consultant BD TriPath, RTP, NC

Summary of Evaluation

Teaching: Dr. Parker has designed two lectures to introduce new epigenomics and genome-wide association study material to first year medical students in the Foundations in Molecular Medicine course. He designed a series of lectures and labs to introduce graduate students to ATAC-seq data analysis methods in the Bioinformatics 545 (Biostatistics 646): High-throughput Molecular Genomic and Epigenomic Data Analysis course. Dr. Parker also teaches in Bioinformatics 523 (Bioinformatics Basic Biology Lab), Bioinformatics 525 (Foundations in Bioinformatics and Systems Biology), Human Genetics 821/822 (Student Seminar) and in the Medical School M1 Foundations in Molecular Medicine course to introduce students to genetics, genomics, and epigenomics concepts. Nationally, he has given many teaching lectures including a lecture for DNA Day for the Smithsonian National Museum of Natural History in 2014. Dr. Parker has had 11 Ph.D. students perform research rotations in his laboratory. Of these, four have continued their Ph.D. dissertation research in his laboratory. He has also mentored three post-doctoral fellows, two actively and the other has taken a second post-doctoral fellowship at the University of Chicago. Dr. Parker has mentored six undergraduate students, including one as part of the UM-SMART Program. In addition to his own graduate students, he currently serves or has served on the dissertation committees of 11 other graduate students (and has served on 10 preliminary exam committees for bioinformatics graduate students.

Research: The major goal of Dr. Parker's lab is to generate mechanistic knowledge about how disease susceptibility is encoded in the non-coding portion of the genome, with a focus on Type 2 Diabetes. They are accomplishing this through an interdisciplinary combination of

molecular/cellular and computational approaches. Specifically, they generate multiple high-throughput data sets on the genome, epigenome, and transcriptome across species and in disease-relevant tissues and cells and develop and use computational approaches to integrate and analyze this data. Dr. Parker has been involved with large team research efforts on understanding genomic regulatory factors underlying Type 2 Diabetes (T2D) through GWAS studies. In addition to these contributions as a team scientist, he is equally talented as an independent investigator as the principal investigator of an R01 to study genomic regulatory sequence changes that increase risk for developing T2D in humans. This work is showcased in his 2017 *PNAS* publication. He is the principal investigator of grants from the American Diabetes Association and as a co-principal investigator of institutional funding. Dr. Parker has published 40 peer-reviewed articles, and has been invited to present his research on more than 30 occasions regionally, nationally and internationally.

#### Recent and Significant Publications

Orchard P, White J, Thomas P, Mychalowych A, Kiseleva A, Hensley J, Allen B, Parker S, Keegan C: Genome-wide chromatin accessibility and transcriptome profiling show minimal epigenome changes and coordinated transcriptional dysregulation of hedgehog signaling in Danforth's short tail mice. *Human Molecular Genetics*, Oct. 31, 2018 (*in press*).

Quang D, Guan Y, Parker S: YAMDA: thousand-fold speedup of EM-based motif discovery using deep learning libraries and GPU. *Bioinformatics* May 22 2018.

Varshney A, Scott L, Welch R, Erdos M, Chines P, Narisu N, Albanus R, Orchard P, Wolford B, Kursawe R, Vadlamudi S, Cannon M, Didion J, Hensley J, Kirilusha A, NISC Comparative Sequencing Program, Bonnycastle L, Taylor D, Watanabe R, Mohlke K, Boehnke M, Collins F, Parker S, Stitzel M: Genetic regulatory signatures underlying islet gene expression and type 2 diabetes. *Proceedings of the National Academy of Sciences of the United States of America*. 114(9):2301-2306, 2017.

Scott L, Erdos M, Huyghe J, Welch R, Beck A, Wolford B, Chines P, Didion J, Narisu N, Stringham H, Taylor D, Jackson A, Vadlamudi S, Bonnycastle L, Kinnunen L, Saramies J, Sundvall J, Albanus R, Kiseleva A, Hensley J, Crawford G, Jiang H, Wen X, Watanabe R, Lakka T, Mohlke K, Laakso M, Tuomilehto J, Koistinen H, Boehnke M, Collins F, Parker S: The genetic regulatory signature of type 2 diabetes in human skeletal muscle. *Nature Communications* 29;7:1176, 2016.

Quang D, Erdos, Thx M, Parker S, and Collins F, Motif signatures in stretch enhancers are enriched for disease-associated genetic variants. *Epigenetics & Chromatin*. 16;8:23, 2015.

Service: Dr. Parker has served as a study section reviewer for the Diabetes United Kingdom Grant Review Panel the Agence Nationale de la Recherche and the Medical Research Council for the United Kingdom, the NIH, the American Diabetes Association and the National Aeronautics and Space Administration. He is an editorial board member of *eLife*, and has reviewed for 16 journals. Dr. Parker is a member of 12 institutional committees, including the Peking University Health Center Joint Institute grant review committee. Institutionally, he serves on and has chaired the Computational Medicine and Bioinformatics Admissions Committee and Web Site Committee.

At Michigan Medicine, he serves on the Bioinformatics Core Scientific Advisory Committee, the Executive Committee for the Center for RNA Biomedicine, the Operations Committee for the Medical Scientist Training Program (MSTP), the Epigenomics Core Scientific Advisory Committee, and he currently serves on the DNA Sequencing Core Director Search Committee. For the Department of Human Genetics, he serves on their Genetics and Genomics Campus Connection, Summer Bridge Scholars Program.

External Reviewers:

Reviewer A: “In the course of his main work, Dr. Parker has contributed to collaborative studies in developmental biology, cancer, and inherited disease, all of which leverage genome-wide analysis to identify pertinent cis regulatory elements and networks...Clearly, his team is an asset to colleagues at the University of Michigan and beyond. Dr. Parker has placed himself in an area of high scientific interest and developed methods and personnel who can effectively show the pathways through complex and high-dimensional data into insights on physiology and disease.”

Reviewer B: “He is also committed to extramural service, as evidenced by membership in manuscript and abstract review committees for the American Society for Human Genetics, the American Diabetes Association, and others. His trajectory in the area of teaching and mentorship is impressive, in particular the poster and scholarship awards to two of his graduate students point to his excellence in mentorship, as do his receipt of a Postbac mentor award and innovative teaching awards earlier in his career.”

Reviewer C: “As it turns out he has found the perfect environment to do so at the University of Michigan. The strength of the human genetics community and the focus on type 2 diabetes by some of its key members have provided a rich milieu in which Dr. Parker has thrived. Through his eminently collaborative nature and the productive networks he has cultivated he has come to be known as a rising star in our field, and a leading investigator in his own right.”

Reviewer D: “As a result of this work he has been successful in obtaining two R01 grants, serves as an investigator in a U01 grant, and even more impressively, obtained an American Diabetes Association Pathway Award. ...I can tell you that this is the most competitive grant review I am aware of with only 5-6 grants given for 110-120 candidates (essentially a 5% pay line).”

Reviewer E: “Regarding scholarly activity, there is ample evidence that Dr. Parker warrants promotion to Assoc. Professor. He has a number of good publications to which he has contributed, and several of these represent very significant advances in the field. In particular, his recent senior author paper in Nature Communications provides a superb approach to investigate the transcriptional mechanisms of complex human traits. Many of his papers are collaborative in nature, but that is the norm in his field at this point.”

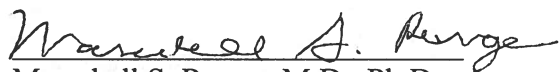
Reviewer F: “He has exhibited excellence and national reputation in research, excellence in teaching and service to the University. Together, these activities and expectation of continued upward trajectory supports his promotion to the rank of Associate Professor.”

Reviewer G: “It is with my strongest enthusiasm that I offer this letter to you as evidence of Dr. Parker’s outstanding scholarship, mentoring and collegiality with other scientific investigators

throughout his relatively short academic career as an independent investigator that stands out among hundreds to thousands of other academic investigators.”

Summary of Recommendations:

Dr. Parker is an accomplished investigator with very unique skills in the allied fields of bioinformatics, computational biology, and human genetics. His publication, grants, and collaborative team leadership make him a rare combination of a highly qualified principal investigator in bioinformatics, with clinical applications, but also as a leadership class team scientist. I am pleased, therefore, to recommend the promotion of Stephen C. J. Parker, Ph.D. to associate professor of computational medicine and bioinformatics, with tenure, Department of Computational Medicine and Bioinformatics, and associate professor of human genetics, without tenure, Department of Human Genetics, Medical School.



Marschall S. Runge, M.D., Ph.D.  
Executive Vice President of Medical Affairs  
Dean, Medical School

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