Approved by the Regents
May 19, 2011

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

Sebastian K. Zoellner, assistant professor of biostatistics, Department of Biostatistics, School of Public Health, and assistant professor of psychiatry, Department of Psychiatry, Medical School, is recommended for promotion to associate professor of biostatistics, with tenure, Department of Biostatistics, School of Public Health, and associate professor of psychiatry, with tenure, Department of Psychiatry, Medical School.

Academic Degrees:

Ph.D. (Biological Sciences)	2001	University of Munich, Leipzig, Germany
M.Sc. (Mathematics)	1997	University of Munich, Leipzig, Germany

Professional Record:

2005 - present	Assistant Professor, Department of Biostatistics, School of Public Health Department of Psychiatry, Medical School, University of Michigan

Summary of Evaluation:

Teaching -- Professor Zoellner's teaching has been somewhat limited due to his joint appointment and because he has been able to buy out of teaching with research grants. He has taught two classes in biostatistics. One is a master's level class (BIOS 665) on statistical population genetics. Although this class has a small official enrollment, it also attracts numerous auditors and even other faculty. The other class is a Ph.D. class on advanced topics in genetic modeling. Both classes have received favorable student evaluations, with both Q1 and Q2 always above 4.00; generally around 4.5. He has four Ph.D. students and serves on 13 other doctoral committees in biostatistics alone, with other advising through psychiatry. Professor Zoellner has also started a popular journal club for students.

Research -- Professor Zoellner's research interests fall into four broad related areas. These are population genetics, copy number variation, rare variants, and genetics of psychiatric diseases. In general, his work brings together theory and modern computational tools to address the complex problem of indentifying aspects of genes that explain the phenotypic variations in various diseases. Since coming to Michigan, Professor Zoellner's contributions to research on copy number variation have received considerable attention. He has developed novel statistical methods for detecting and identifying copy number variation and testing for association with the complex diseases in the context of using the Genome Wide Association Studies (GWAS). Another major area of Professor Zoellner's contribution is in developing methods for scoring polymorphic deletions from the SNP genotypes and hybridization intensity which then aids in investigating the association between polymorphic deletion and phenotypes. He has developed user-friendly software to implement these methods. Professor Zoellner is also making contributions in studying the role of rare variants. With the recent advances in DNA sequencing technology, his method for testing excess of rare variation by combing frequency information of rare variants across individuals in a sample has created excitement.

On the collaborative research front, Professor Zoellner has been using genetics and clinical data and linking them with modern statistical tools to find ways to improve mental health conditions. He is working with internationally renowned scientists in the Department of Psychiatry to assess the role of genetics in bipolar disorders and other mental health conditions. He has helped in the investigation of the link between chromosome 8q24 and bipolar disorder using a family based linkage study. He has also

helped in investigating the role of polymorphic deletions in the increase in risk of bipolar disorder. Thus, his collaborative contributions operate synergistically with his methodological interests.

Recent and Significant Publications:

Zoellner S. (2010) CopyMap: Localization and calling of copy number variation by joint population analysis of oligonucleotide and competitive genomic hybridization data. *Bioinformatics* 26(21):2776-2777.

Zhang P, Xiang N, Silwerska E, Chen Y, McInnis MG, Burmeister M, Zoellner S. (2010) Family-based association analysis to finemap bipolar linkage peak on chromosome 8q24 using 2,500 genotyped SNPs and 15,000 imputed SNPs. *Bipolar Disorders* 12(8):786-792.

Zawistowski M, Gopalakrishnan S, Ding J, Li Y, Grimm S, Zoellner S. (2010) Extending rare variant testing strategies: analysis of non-coding sequence and imputed genotypes. *Am J Hum Genet* 87:604-617.

Saunders EF, Zhang P, Copeland JN, McLnnis MG, Zoellner S. (2009) Suggestive linkage at 9p22 in bipolar disorder weighted by alcohol abuse. *Am J Med Genet B Neuropsychiatr Genet.* 150B: 1133-8.

Smith EN, Bloss CS, Badner JA, Barrett T, Belmonte PL,Berrettini W, Byerley W, William Coryell W, Craig D, Edenberg HJ, Eskin E, Foroud T, Gershon E, Greenwood TA, Hipolito M, Koller DL, Lawson WB, Liu C, Lohoff F, McInnis MG, McMahon FJ, Mirel DB, Murray SS, Nievergelt C, Nurnberger J, Nwulia EA, Paschall J, Potash JB, Rice J, Schulze TG, Scheftner W, Panganiban C, Zaitlen N, Zandi PP, Zoellner S, Schork NJ, Kelsoe JR. (2009) Genome-wide association study of bipolar disorder in European American and African American individuals. *Mol Psychiatry* 14: 755-63.

Zoellner S, Teslovich TM. (2009) Using GWAS data to identify copy number variants contributing to common complex diseases. *Statistical Science* 24: 530-46.

Zhang D, Cheng L, Qian Y, Alliey-Rodriguez N, Kelsoe JR, Greenwood T, Nievergelt C, Barrett TB, McKinney R, Schork N, Smith EN, Bloss C, Nurnberger J, Edenberg HJ, Foroud T, Sheftner W, Lawson WB, Nwulia EA, Hipolito M, Coryell W, Rice J, Byerley W, McMahon F, Schulze TG, Berrettini W, Potash JB, Belmonte PL, Zandi PP, McInnis MG, Zoellner S, Craig D, Szelinger S, Koller D, Christian SL, Liu C, Gershon ES. (2009) Singleton deletions throughout the genome increase risk of bipolar disorder. *Mol Psychiatry* 14: 376-380.

Zoellner S, Su G, Stewart WC, Chen Y, McInnis MG, Burmeister M. (2009) EM Algorithm for scoring polymorphic deletions from SNP data and application to a common CNV on 8q24. *Genet Epidemiol* 33: 357-368.

Henrichsen CN*, Vinckenbosch N*, Zoellner S*, Chaignat E, Pradervand S, Ruedi M, Kaessmann H, Reymond. (2009) Segmental copy number variation shapes tissue transcriptomes. *Nat Genet* 41: 424-429. [* denotes equal contribution]

Zandi PP, Zoellner S, Avramopoulos D, Willour VL, Qin ZS, Burmeister M, Miao K, Gopalakrishnan S, Potash JB, DePaulo JR, McInnis MG. (2008) Family–based SNP association study on 8q24 in bipolar disorder. *Am J Med Genet B Neuropsychatr Genet.* 147B(5): 612-618.

Burmeister M, McInnis MG, Zoellner S. (2008) Psychiatric genetics: progress among controversies. *Nat Rev Genet* 9: 527-540.

She X, Cheng Z, Zoellner S, Church D, Eichler EE. (2008) Extensive copy number variation of mouse segmental duplications. *Nat Genet* 40: 909-914.

Liang L, Zoellner S, Abecasis GR. (2007) GENOME: A rapid coalescent-based whole genome simulator. *Bioinformatics* 23:1565-1567.

Service: Professor Zoellner has made excellent contributions to the department as well as to the profession. He has served on the departmental computer and admission committees (the admission committee involves serious time commitment). He has been on an epidemiology search committee, as well as various intramural grant review committees in the Center for Computational Medicine and Biology and the Center for Genetics in Health and Medicine. In addition, he routinely consults with

researchers in the Medical School on their grant proposals and analysis issues, usually the unfunded mandates in the life of any biostatistician.

On the national front, he reviewed articles for 20 or so journals, served on grant review panels for NSF, Department of Veteran Affairs, and NIDCR. He has also served on the grant review panel for the Association for the Study of Infectious Disease Genetics (Switzerland) and German Research Foundation. He also serves on a population genetics panel for the annual meeting of the American Society of Human Genetics.

External Reviewers:
Reviewer (A): "Specifically, it is his methodological work that has impressed me. In this regard, he has shown himself to be a leader in the field of the analysis of the genetic contributions to complex diseases. The quality of his writing is of the highest caliber and his publication record is outstanding – not only in its volume but in his citations by other high impact papers."

Reviewer (B): "...Sebastian Zoellner has a broad understanding of human population genetic processes, and of computation and statistical methods which put him in an excellent position to continue on a creative and innovative career. He is by all accounts already recognized as a major player in the field, and I am confident that his influence will continue to grow as his career takes off."

Reviewer (C): "I am convinced Dr. Zoellner is a creative researcher in the field of statistical genetics and deserves to be promoted."

Reviewer (D): "In my opinion, you would be fully justified in promoting him to tenure. His record of productivity merits nothing less. He compares favorably with the best members of his age cohort in the field of genetic epidemiology and would be promoted to tenure in any university I know."

Reviewer (E): "He is well rounded, with expertise in human genetics, population genetics, statistics and computation. His research has been well-funded by NIH and has been recognized internationally."

Reviewer (F): "I see Dr. Zoellner as a [junior] scientist who has already made significant contributions to human genetics and who will emerge as one of the leaders in statistical genetics. I strongly favor his promotion and tenure at this time."

Reviewer (G): "You can consider yourself fortunate to have recruited such a star, whom I'm certain you will want to retain and who can be counted upon to continue his current trajectory."

Summary of Recommendation: Based on Professor Zoellner's strong record of scholarly publications, external funding, and national recognition, as well as his teaching and professional service, we are pleased to recommend that Professor Sebastian K. Zoellner be promoted to the rank of associate professor of biostatistics, with tenure, Department of Biostatistics, School of Public Health, and associate professor of psychiatry, with tenure, Department of Psychiatry, Medical School.

Martin A. Philbert, Ph.D.
Dean, School of Public Health

James O. Woolliscroft, M.D.
Dean, Medical School
Lyle C. Roll Professor of Medicine

May 2011