

CURRICULUM VITAE

Name: David M. Umbach

Citizenship: United States of America

Education:

1992	Ph.D.	Biometry (minor Statistics)	Cornell University
1983	M.S.	Ecology (minor Statistics)	The Pennsylvania State University
1970	B.A.	Physics and Philosophy	Yale University
1972	Teaching Certificate in Secondary School Science and Mathematics (New Jersey) via continuing education		Temple University

Brief Chronology of Employment:

1992-present	Staff Fellow/Senior Staff Fellow/Investigator/Staff Scientist, Biostatistics Branch, Environmental Diseases and Medicine Program, National Institute of Environmental Health Sciences.
1990-1991	Lecturer, Cornell University, Ithaca, NY.
1981-1989	Teaching or Research Assistant, Cornell University, Ithaca, NY.
1977-1981	Research Assistant, Center for Air-Environment Studies, The Pennsylvania State University, University Park, PA.
1970-1975	Secondary School Mathematics Teacher, Willingboro School District, Willingboro, NJ.

Professional Societies:

American Statistical Association
Biometric Society, Eastern North American Region
Institute of Mathematical Statistics

Honors and Other Special Scientific Recognition:

Mathematical Sciences Institute Graduate Fellowship, Cornell University, 1986-87.
Sage Graduate Fellowship, Cornell University, 1985-86.
Mu Sigma Rho, National Statistical Honor Society, elected 1983.
Garden Club of America Graduate Scholarship, 1981-82.
National Merit Scholarship, 1966-70.

Service within the NIEHS:

Invited participant, EPA/NIEHS workshop *Applying Biomarker Research*, 30-31 August 1999, Chapel Hill, NC.
Invited participant, NIEHS/NIH workshop *Epidemiology in the 21st Century*, November, 1999, Raleigh, NC.
Invited participant, NIEHS workshop, *Respiratory Disease in the Agricultural Health Study*, 3-4 February 2003, Research Triangle Park, NC.

Member, NIEHS National Center for Toxicogenomics, Toxicology/Pathology Working Group, 2002-2006.

Ad hoc statistical reviewer of clinical proposals for the NIEHS IRB, ongoing.

Member, NIEHS Science Review Committee, 2003-2006.

Professional Activities:

Associate Editor, *Journal of the American Statistical Association*, 1996-99.

Representative to Council of Sections, Section on Statistics and the Environment, American Statistical Association (elected), 2000-2002.

Member, Expert Panel for Review of Soy Formula and Genistein, National Toxicology Program, Center for the Evaluation of Risks to Human Reproduction, DHHS, September 2005 through March 2006.

Ad hoc referee/reviewer for a variety of journals including in the last 5 years: *American Journal of Epidemiology*, *American Journal of Human Genetics*, *Annals of Epidemiology*, *Annals of Human Genetics*, *Biometrics*, *Biometrika*, *BMC-Bioinformatics*, *Cancer Epidemiology Biomarkers and Prevention*, *Environmental Health Perspectives*, *European Journal of Psychological Assessment*, *Epidemiology*, *Genetic Epidemiology*, *Human Heredity*, *International Journal of Epidemiology*, *Journal of the American Statistical Association*, *Journal of Biological Optics*, *Perinatal and Pædiatric Epidemiology*, *Pharmacogenetics*, *Statistics in Medicine*.

PEER-REVIEWED PUBLICATIONS

1. Davis DD, **Umbach DM**, Coppolino JB. Susceptibility of tree and shrub species and response of black cherry foliage to ozone. *Plant Disease* 1981; 65: 904-907.
2. **Umbach DM**, Davis DD, Pennypacker SP. A comparison of several dose-response models based on laboratory exposures of tree seedlings to sulfur dioxide. *J Air Pollut Cont Assoc* 1983; 33: 1073-1079.
3. **Umbach DM**, Davis DD. Severity and frequency of SO₂-induced leaf necrosis on seedlings of 57 tree species. *For Sci* 1984; 30: 587-596.
4. **Umbach DM**, Davis DD. Severity of SO₂-induced leaf necrosis on Caribbean, Scots, and Virginia pine seedlings. *J Air Pollut Cont Assoc* 1986; 36: 1019-1021.
5. **Umbach DM**, Davis DD. The influence of humidity and temperature during exposure on SO₂-induced leaf necrosis on Virginia pine and river birch. *Can J For Res* 1987; 17: 1213-1218.
6. Koslowski B, Okagaki L, Lorenz C, **Umbach D**. When covariation is not enough: the role of causal mechanism, sampling method, and sample size in causal reasoning. *Child Development* 1989; 60: 1316-1327.
7. Specker DR, Shields EJ, **Umbach DM**, Allen SA. Mortality response of potato leafhopper (Homoptera: Cicadellidae) to low temperatures: implications for predicting overwintering and early migrant mortality. *J Econ Entomol* 1990; 83(4): 1541-1548.
8. Rubin G, **Umbach D**, Shyu S-F, Castillo-Chavez C. Using capture-recapture methodology to estimate the size of a population at risk for AIDS and other sexually transmitted diseases. *Statistics in Medicine* 1992; 11:1533-1549. (also available as BU-1112-M in the Biometrics Unit Technical Report Series, Cornell University, Ithaca, NY 14853.)
9. Weinberg CR, **Umbach DM**, Greenland S. When will nondifferential misclassification of an exposure preserve the direction of a trend? *Am J Epidemiol* 1994; 140(6): 565-571.

10. Baird DD, **Umbach DM**, Lansdell L, Hughes C, Setchell K, Weinberg CR, Haney AF, Wilcox AJ, McLachlan JA. Lack of estrogenic effects in postmenopausal women eating a soy diet. *J Clin Endocr Metab* 1995; 80: 1685-1690.
11. Manasco PK, **Umbach DM**, Muly SM, Godwin DC, Negro-Vilar A, Culler MD, Underwood LE. Ontogeny of gonadotropin, testosterone, and inhibin secretion in normal boys through puberty based on overnight serial sampling. *J Clin Endocr Metab* 1995; 80: 2046-2052.
12. Bell DA, Stephens E, Castranio T, **Umbach DM**, Watson M, Deakin M, Elder J, Duncan H, Hendrickse C, Strange RC. Polyadenylation polymorphism in the N,O-acetyltransferase gene (NAT1) increases risk of colorectal cancer. *Cancer Res* 1995; 55: 3537-3542.
13. Wilcox AJ, **Umbach DM**, Hornsby PP, Herbst AL. Age at menarche among DES granddaughters. *Am J Obstet Gynecol* 1995; 173: 835-836.
14. **Umbach DM**, Wilcox AJ. A technique for measuring epidemiologically useful features of birthweight distributions. *Statistics in Medicine* 1996; 15: 1333-1348.
15. Weinberg CR, Moledor ES, **Umbach DM**, Sandler DP. Imputation for exposure histories with gaps under an excess relative risk model. *Epidemiology* 1996; 7: 490-497.
16. Cooper GS, **Umbach DM**. Are vitamin D receptor polymorphisms associated with bone mineral density? a meta-analysis. *J Bone Miner Res* 1996; 11:1841-1849.
17. **Umbach DM**, Weinberg CR. Designing and analyzing case-control studies to exploit independence of genotype and exposure. *Statistics in Medicine* 1997;16:1731-1743.
18. Manasco PK, **Umbach DM**, Muly SM, Godwin DC, Negro-Vilar A, Culler MD, Underwood LE. Ontogeny of gonadotropin and inhibin secretion in normal girls through puberty based on overnight serial sampling and a comparison to normal boys. *Human Reproduction* 1997; 12:2108-2114.
19. Taylor JA, **Umbach DM**, Stephens E, Castranio T, Paulson D, Robertson C, Mohler J, Bell DA. The role of N-acetylation polymorphisms in smoking-associated bladder cancer: evidence of a gene-gene-exposure 3-way interaction. *Cancer Res* 1998; 58: 3603-3610.
20. Tseng M, Weinberg CR, **Umbach DM**, Longnecker MP. Calculation of population attributable risk for alcohol and breast cancer (United States). *Cancer Causes and Control* 1999; 10:119-123.
21. Weinberg CR, **Umbach DM**. Using pooled exposure assessment to improve efficiency in case-control studies. *Biometrics* 1999; 55(3):152-160.
22. Kamel F, **Umbach DM**, Munsat TL, Shefner JM, Sandler DP. Association of cigarette smoking with amyotrophic lateral sclerosis. *Neuroepidemiology* 1999; 18:194-202.
23. Monks SA, Martin ER, **Umbach DM**, Kaplan NL. Two tests of association for a susceptibility locus for families of variable size: an example using two sampling strategies. In: Goldin L, Amos CI, Chase GA, Goldstein AM, Jarvik GP, Martinez MM, Suarez BK, Weeks DW, Wijsman EM, MacCluer JW, eds. Genetic Analysis Workshop 11: Analysis of genetic and environmental factors in common diseases. *Genetic Epidemiology* 1999; 17 (Suppl 1): S655-S660.
24. **Umbach DM**. Unit conversion as a source of misclassification in U.S. birthweight data. *Am J Public Health* 2000; 90:127-129.
25. Blazer DG, **Umbach DM**, R.M. Bostick RM, Taylor JA. Vitamin D receptor polymorphisms and prostate cancer. *Molecular Carcinogenesis* 2000; 27:18-23.
26. **Umbach DM**, Weinberg CR. Using case-parent triads to study the joint effects of genotype and exposure. *Am J Human Genetics* 2000; 66:251-161.

27. Lunn RM, Helzlsouer KJ, Parshad R, **Umbach DM**, Harris E, Sanford KK, Bell DA. XPD polymorphisms: effects on DNA repair proficiency. *Carcinogenesis* 2000; 21:551-555.
28. Longnecker MP, Kamel F, **Umbach DM**, Munsat TL, Shefner JM, Lansdell LW, Sandler DP. Dietary intake of calcium, magnesium, and antioxidants in relation to risk of amyotrophic lateral sclerosis. *Neuroepidemiology* 2000; 19:210-216.
29. Weinberg CR, **Umbach DM**. Choosing a retrospective design to assess joint genetic and environmental contributions to risk. *Am J Epidemiol* 2000; 152:197-203.
30. Boissy RJ, Watson MA, **Umbach DM**, Deakin M, Elder J, Duncan H, Strange RC, Bell DA. A pilot study investigating the role of *NAT1* and *NAT2* polymorphisms in gastric adenocarcinoma. *Int J Cancer* 2000; 87:507-511.
31. Stern MC, **Umbach DM**, van Gils C, Lunn RM, Taylor JA. DNA repair gene *XRCC1* polymorphisms, smoking, and bladder cancer risk. *Cancer Epidemiol Biomark Prev* 2001; 10:125-131.
32. Stern MC, **Umbach DM**, Yu MC, London SJ, Zhang Z-Q, Taylor JA. Hepatitis B, aflatoxin B₁, and *p53* codon 249 mutation in hepatocellular carcinomas from Guangxi, PRC, and a meta-analysis of existing studies *Cancer Epidemiol Biomark Prev* 2001; 10:617-625.
33. Rowland AS, **Umbach DM**, Catoe KE, Stallone L, Long S, Rabiner D, Naftel AJ, Panke D, Faulk R, Sandler DP. Studying the epidemiology of attention-deficit/hyperactivity disorder: screening method and pilot results. *Canadian Journal of Psychiatry* 2001; 46:931-940.
34. Rowland AS, **Umbach DM**, Stallone L, Naftel AJ, Bohlig EM, Sandler DP. Prevalence of medication treatment for attention-deficit/hyperactivity disorder (ADHD) among elementary school children in Johnston County, NC. *Am J Public Health* 2002; 92: 231-234.
35. Hoppin JA, **Umbach DM**, London SJ, Alavanja MCR, Sandler DP. Chemical predictors of wheeze among farmer applicators in the Agricultural Health Study. *Am J Respir Crit Care Med* 2002; 165: 683-689.
36. Kamel F, **Umbach DM**, Hu H, Munsat TL, Shefner JM, Sandler DP. Lead exposure and amyotrophic lateral sclerosis (ALS). *Epidemiology* 2002; 13:311-319.
37. Stern MC, **Umbach DM**, Lunn RM, Taylor JA. DNA repair gene *XRCC3* codon 241 polymorphism, its interaction with smoking and *XRCC1* polymorphisms in bladder cancer risk. *Cancer Epidemiol Biomark Prev* 2002; 11:939-943.
38. Slebos RJC, Oh DS, **Umbach DM**, Taylor JA. Mutations in tetranucleotide repeats following DNA damage depend on repeat sequence and carcinogenic agent. *Cancer Research* 2002; 62:6052-6060.
39. Peddada SD, Lobenhofer EK, Li L, Afshari CA, Weinberg CR, **Umbach DM**. Gene selection and clustering for time-course and dose-response microarray experiments using order restricted inference. *Bioinformatics* 2003; 19:834-841.
40. Hoppin JA, **Umbach DM**, London SJ, Alavanja MCR, Sandler DP. Animal production and wheeze in the Agricultural Health Study: interactions of atopy, asthma, and smoking. *Occupational and Environmental Medicine* 2003; 60:e3 (electronically published with URL <http://www.occenvmed.com/cgi/content/full/60/8/e3>).
41. Kamel F, **Umbach DM**, Lehman TA, Park LP, Munsat TL, Shefner JM, Sandler DP, Hu H, Taylor JA. Amyotrophic lateral sclerosis, lead, and genetic susceptibility: δ -aminolevulinic acid dehydratase and vitamin D receptor genes. *Environmental Health Perspectives* 2003; 111:1335-1339.

42. Slebos RJC, Little RE, **Umbach DM**, Zadaorozhnaja TD, Mendel NA, Antipkin Y, Sommer CA, Conway K, Parrish E, Gulino S, Taylor JA. Mini- and Microsatellite mutations in children from Chernobyl accident cleanup workers. *Mutation Research* 2004; 559:143-151.
43. Slebos RJC, **Umbach DM**, Sommer CA, Horner GA, Choi J, Taylor JA. Analytical and statistical methods to evaluate microsatellite allelic imbalance in small amounts of DNA. *Laboratory Investigation* 2004; 84:649-657.
44. Liu D, **Umbach DM**, Peddada SD, Li L, Crockett P, Weinberg CR. A random-periods model for expression of cell-cycle genes. *Proceedings of the National Academy of Sciences* 2004; 101:7240-7245.
45. Hoppin JA, **Umbach DM**, London SJ, Alavanja MCR, Sandler DP. Diesel exhaust, solvents, and other occupational exposures as risk factors for wheeze among farmers. *Am J Respir Crit Care Med* 2004; 169:1308-1313.
46. Kirrane EF, Hoppin JA, **Umbach DM**, Samanic C, Sandler DP. Patterns of pesticide use and their determinants among wives of farmer pesticide applicators in the Agricultural Health Study. *J Occ Environl Med* 2004; 46:856-865.
47. Li L, **Umbach DM**, Terry P, Taylor JA. Application of the GA/KNN method to SELDI proteomics data analysis. *Bioinformatics* 2004; 20:1638-1640.
48. Terry PD, Kamel F, **Umbach DM**, Lehman TA, Hu H, Sandler DP, Taylor JA. VEGF promoter haplotype and amyotrophic lateral sclerosis (ALS). *Journal of Neurogenetics* 2004; 18:429-434.
49. Kirrane EF, Hoppin JA, Kamel F, **Umbach DM**, Boyes WK, DeRoos A, Alavanja M, Sandler DP. Retinal degeneration and other eye disorders in wives of farmer pesticide applicators enrolled in the Agricultural Health Study. *American Journal of Epidemiology* 2005; 161:1020-1029.
50. Terry P, **Umbach DM**, Taylor JA. No association between SOD2 or NQO1 genotypes and risk of bladder cancer. *Cancer Epidemiology, Biomarkers and Prevention* 2005; 14:753-754.
51. Weinberg CR, **Umbach DM**. A hybrid design for studying genetic influences on risk of diseases with early onset in life. *American Journal of Human Genetics* 2005; 77:627-636.
52. Kamel F, **Umbach DM**, Hu H, Munsat TL, Shefner JM, Taylor JA, Sander DP. Lead Exposure as a Risk Factor for Amyotrophic Lateral Sclerosis (ALS). *Neurodegenerative Diseases* 2005; 2 (3-4):195-201.
53. Terry P, **Umbach DM**, Taylor JA. APE1 genotype and risk of bladder cancer: evidence for effect modification by smoking. *International Journal of Cancer*. 2006; 118:3170-3173.
54. Huang W, **Umbach DM**, Li L. Accurate anchoring alignment of divergent sequences. *Bioinformatics* 2006; 22:29-34.
55. Hoppin JA, **Umbach DM**, London SJ, Lynch CF, Alavanja MCR, Sandler DP. Pesticides associated with wheeze among commercial pesticide applicators in the Agricultural Health Study. *American Journal of Epidemiology* 2006; 163:1129-1137.
56. Huang W, **Umbach DM**, Ohler U, Li L. Optimized mixed Markov models for motif identification. *BMC Bioinformatics* 2006, 2 June; 7:279 (electronic access).
57. Rozman KK, Bhatia J, Calafat AM, Chambers C, Culty M, Etzel RA, Flaws JA, Hansen DK, Hover PB, Jeffery EH, Kesner JS, Marty S, Thomas JA, **Umbach D**. NTP-CERHR Expert Panel Report on the reproductive and developmental toxicity of soy formula. *Birth Defects Research, Part B. Developmental and Reproductive Toxicology* 77(4):280-397.

58. Yim HW, Slebos RJC, Randell SH, **Umbach DM**, Rivera MP, Detterbeck FC, Taylor JA. Smoking is associated with increased telomerase activity in short-term cultures of human bronchial epithelial cells. *Cancer Letters* 2006; [Epub ahead of print].
59. Kamel F, Tanner CM, **Umbach DM**, Hoppin JA, Alavanja MCR, Blair A, Comyns K, Goldman SM, Korell M, Langston JW, Ross GW, Sandler DP. Pesticide exposure and self-reported Parkinson's Disease in the Agricultural Health Study. *American Journal of Epidemiology* 2006; doi 10.1093/aje/kwk024.
60. Foley JF, Collins JB, **Umbach DM**, Grissom S, Boorman GA, Heinloth, AN. Optimal sampling of rat liver tissue for toxicogenomics studies. *Toxicological Pathology* (in press).
61. Shaughnessy DT, Schaaper R, **Umbach DM**, DeMarini DM. Inhibition of spontaneous mutagenesis by vanillin and cinnamaldehyde in *Escherichia coli*: dependence on recombinational repair. *Mutation Research* (in press).
62. Hoppin JA, **Umbach DM**, Kullman GJ, Henneberger PK, London SJ, Alavanja MCR, Sandler DP. Pesticides and other agricultural factors associated with self-reported farmer's lung among farm residents in the Agricultural Health Study. *Occupational and Environmental Medicine*. (in press).
63. Rowland AS, **Umbach DM**, Bohlig M, Stallone L, Sandler DP. Aligning response category wording with DSM-IV: psychometric and epidemiologic implications for an ADHD rating scale. *Journal of Attention Disorders*. (in press).

MANUSCRIPTS SUBMITTED OR UNDER REVISION

1. Rowland AS, Skipper B, Rabiner D, **Umbach DM**, Stallone L, Naftel AJ, Sandler DP. The shifting subtypes of ADHD.
2. Peddada SD, **Umbach DM**, Harris, S. Statistical analysis of time-course and dose-response microarray experiments.
3. Monti P, Ciribilli Y, Jordan J, Menichini P, **Umbach DM**, Resnick MA, Luzzato L, Inga A, Fronza G. Transcriptional functionality of germline p53 alleles influences cancer phenotype.
4. Bernbaum JC, **Umbach DM**, Ragan NB, Ballard JL, Archer J, Davis H, Rogan WJ. Pilot studies of sex hormone related findings in infants: physical findings.
5. Valcin M, Henneberger PK, Kullman GJ, **Umbach DM**, London SJ, Alavanja MCR, Sandler DP, Hoppin JA. Risk factors for chronic bronchitis among non-smoking farm women in the Agricultural Health Study.
6. King AA, Shaughnessy DT, Mure K, Ward WO, **Umbach DM**, Xu Z, Ducharme D, Taylor JA, DeMarini DM, Klein CB. Antimutagenicity and global gene expression of cinnamaldehyde and vanillin in human cells: possible role of DNA damage and repair.
7. Weinberg CR, Shore D, **Umbach DM**, Sandler DP. Using risk-based sampling to enrich cohorts for endpoints, genes, and exposures.
8. Shi M, **Umbach DM**, Weinberg CR. A general method for identification of risk-related haplotypes using multiple linked SNPs from nuclear families.
9. Chen H, Richards M, Sandler DP, **Umbach DM**, Kamel F. Head injury and amyotrophic lateral sclerosis.

INVITED PUBLICATIONS

1. **Umbach DM**. Invited Commentary: On studying the joint effects of candidate genes and exposures. *Am J Epidemiol* 2000; 152:701-703.

2. **Umbach DM.** Effect size In El-Shaarawi AH, Piegorisch WW, eds. *Encyclopedia of Environmetrics*. New York: John Wiley & Sons 2001; vol ?, pp ??.
3. **Umbach DM.** Commentary: On the determination of sample size. *Epidemiology* 2003; 14:137-138.

CONFERENCE PROCEEDINGS, REVIEWS, BOOK CHAPTERS

1. Davis DD, **Umbach DM**, Pennypacker SP, Coppolino JB. Probability of acute SO₂-damage occurring on trees near existing or proposed sources of SO₂. *Mitteilungen der forstlichen Bundesversuchanstalt Wien* 1981; 137: 141-143.
2. Castillo-Chavez C, Shyu S-F, Rubin G, **Umbach DM**. On the estimation problem of mixing/pair formation matrices with applications to models for sexually-transmitted diseases In: Jewell NK, Dietz K, Farewell VT, eds. *AIDS Epidemiology: Methodological Issues*. Boston: Birkhauser, 1992; 384-402.
3. Green AM, **Umbach DM**. Calculating confidence intervals on proportions of variability using the VARCOMP and IML procedures. *Proceedings of the Twentieth Annual SAS Users Group International Conference*. Cary, NC. SAS Institute Inc. 1995. pp 1058-1063.
4. Dinse GE, **Umbach DM**, Sasco AJ, Hoel DG, Davis DL. Increasing cancer incidence in the United States from 1975 to 1994: What are the causes? *Ann Rev Public Health* 1999; 20: 173-209.
5. Rowland AS, **Umbach DM**, O'Callaghan JP, Miller DB, Dunnick JK. Public health and toxicological issues concerning stimulant treatment for ADHD. In Jensen PS, Cooper JR, eds. *Attention Deficit Hyperactivity Disorder: State of the Science & Best Practices*, Civic Research Institute, Kingston, NJ. 2002; pages 10-1 through 10-16.
6. Hoppin JA, **Umbach DM**, London SJ, Lynch CF, Alavanja MCR, Sandler DP. Pesticides and adult respiratory outcomes in the Agricultural Health Study. Presented at the Collegium Ramazzini sponsored conference: Framing the Future in light of the Past: Living in a Chemical World, Bologna, Italy, 18-21 September 2005. To appear in *Annals of the N. Y. Academy of Sciences* 2006; 1076: ??-??.

LETTERS

1. Weinberg CR, **Umbach DM**, Greenland S. Authors' reply to letters by D. Thomas and N.J. Birkett RE: "When will nondifferential misclassification of an exposure preserve the direction of a trend?" *Am J Epidemiol* 1995; 142: 784.

INVITED PRESENTATIONS

1. **Umbach DM.** 1995. Statistical methods for assessing gene × environment interactions. Presented to the Department of Epidemiology, University of North Carolina, May 2, Chapel Hill, NC.
2. **Umbach DM.** 1996. Statistical methods for evaluating gene-environment interaction. Presented at the meeting of Piedmont Genetic Epidemiology Society, March 6, Chapel Hill, NC.
3. **Umbach DM.** 1998. Detecting interactions between environmental factors and candidate genes: statistical design and analysis. Presented at the Southern Research Conference on Statistics, Session on Statistics in Environmental Health. June 7-11, Navarre Beach, FL.
4. **Umbach DM.** 1999. Approaches to studying gene-by-environment interaction. Presented at the 1999 American Association for Advancement of Science Annual Meeting, January 21-26, Anaheim, CA.

5. **Umbach DM.** 1999. Genotype-exposure interactions: What can studies of cases and their parents tell us? Presented at 20th Annual David W. Smith Workshop on Malformations and Morphogenesis, August 3-9, Schlangenbad, Germany.
6. **Umbach DM.** 2000. Studying gene-environment interactions with case-parent designs. Presented at the meeting of the Piedmont Genetic Epidemiology Society. February 25, Research Triangle Park, NC.
7. **Umbach DM.** 2000. Designs for studying how exposures and genes together influence disease risk. Presented at the meeting of the Triangle Reproductive Health Network. April 5, Research Triangle Park, NC.
8. **Umbach DM.** 2001. Study designs that use parents and an offspring to investigate the joint effects of exposures and candidate genes on disease risk. Presented at the US-European Workshop: Gene-Environment Research at the Interface of Toxicology and Epidemiology. September 4-5, Garmisch-Partenkirchen, Germany.
9. **Umbach DM.** 2004. Combining information from multiple studies to improve inference about genetic and environmental risks. Poster/Discussion at the 16th Conference of the International Society for Environmental Epidemiology Annual Meeting, August 1-4, New York, NY.
10. **Umbach DM.** 2004. Reducing the genotyping needed for case-parents designs by pooling DNA samples. Presented at the 2004 Joint Statistical Meetings, August 8-12, Toronto, Ontario, Canada