

Curriculum Vitae

Leena Choi, Ph.D.

Assistant Professor of Biostatistics
Department of Biostatistics
Vanderbilt University School of Medicine
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EDUCATION

- 2005 **Ph.D. in Biostatistics**
Johns Hopkins University Bloomberg School of Public Health, Baltimore, MD,
U.S.A.
Dissertation: “Modelling biomedical data and the foundations of bioequiva-
lence”
Advisor: Brian Caffo
Co-advisor: Charles Rohde
- 1995 **M.S. in Physical Pharmacy**
Seoul National University College of Pharmacy, Seoul, Korea
Thesis: “Solubilization of Cyclosporin A using liposomes and mixed micelles,
and pharmacokinetics after intravenous administration”
Advisor: Chong-Kook Kim
- 1988 **B.S. in Pharmacy**
Seoul National University College of Pharmacy, Seoul, Korea

POSITIONS AND WORK EXPERIENCE

- 2005 – Present **Assistant Professor**
Department of Biostatistics, Vanderbilt University School of Medicine, Nashville,
TN.
- 2003 – Present **Collaborative Research Experience**
- Dr. Timothy Blackwell group, Vanderbilt University School of Medicine (2008 – present).
 - Dr. Michael Stein group, Vanderbilt University School of Medicine, Division of Clinical Pharmacology (2007 – present).
 - Dr. Maciej Buchowski Energy Balance Laboratory group, Vanderbilt University School of Medicine (2006 – present).

- Dr. Italo Biaggioni group, Vanderbilt University School of Medicine, Division of Clinical Pharmacology (2006 – present).
- Department of Pharmaceutical Services, Vanderbilt University (2006 – 2007).
- Division of Clinical Pharmacology, Vanderbilt University School of Medicine (2005 – 2006).
- Dr. Craig W. Hendrix group, Johns Hopkins University School of Medicine (2003 – 2005).
- Dr. Gary Wand group, Johns Hopkins University School of Medicine (2003 – 2005).
- Dr. Jennifer Haythornthwaite group, Johns Hopkins University School of Medicine (2004 – 2005).

2000 – 2005

Statistical Consultant

Johns Hopkins University Biostatistics Consulting Center, Baltimore MD.

- Developed statistical short courses for training pharmaceutical employees.
 1. Nonlinear mixed models in pharmaceutical research: a case study with real data, July 24, 2002.
 2. Nonlinear mixed models for pharmacokinetics and pharmacodynamics: application to QT data, December 11, 2002.
- Data analyst/consultant.

1995 – 1999

Regulatory Agent

Korea Food and Drug Administration, Seoul, Korea.

Actively engaged in reviewing the application of drug products, inspecting drug products, implementing relevant laws and regulations for the safety of the drugs, and carrying out research related to health sciences and new drug evaluation.

1990 – 1991

Pharmacist

Daehak Drug Store, Seoul, Korea.

TEACHING ACTIVITIES

Spring 2007

Instructor

Course: IGP-304 “Statistics for Biomedical Research” (co-instructor: Chun Li).
<http://biostat.mc.vanderbilt.edu/IntroBiostatCourse2007>
 Vanderbilt University School of Medicine, Nashville, TN.

2005 – 2007

Instructor

Course: “Short Course for Clinical Pharmacology Fellows”.
 Fellows Conference, Division of Clinical Pharmacology, Vanderbilt University School of Medicine, Nashville, TN.

2002 – 2005

Teaching Assistant/Consultant

Role: Statistical consultant/TA for helping Ph.D students in Department of

Health Policy and Management at Johns Hopkins University Bloomberg School of Public Health to aid in the statistical analysis for their dissertations.
Department of Biostatistics, Johns Hopkins University Bloomberg School of Public Health, Baltimore, MD.

- 2002 **Teaching Assistant**
Course: 140.641 “Survival Analysis”.
Department of Biostatistics, Johns Hopkins University Bloomberg School of Public Health, Baltimore, MD.
- 2000 – 2002 **Teaching Assistant**
Courses: 140.621 - 140.623 “Statistical Methods in Public Health I – III”.
Department of Biostatistics, Johns Hopkins University Bloomberg School of Public Health, Baltimore, MD.
- 1994 **Teaching Assistant**
Courses: “Physical Pharmacy Laboratory”.
Physical Pharmacy Laboratory, Seoul National University College of Pharmacy, Seoul, Korea.

AWARDS, HONORS AND LISCENCES

- 2005 Elected to Phi Beta Kappa
Department of Biostatistics, Johns Hopkins University Bloomberg School of Public Health, Baltimore, MD.
- 1997 KFDA Best Presentation Award from the Commissioner of Korea Food and Drug Administration, Korea.
- 1995 Registered air environmental engineer, Korea (7/24/1995)
- 1989 Registered pharmacist, Korea (3/13/1989)

PROFESSIONAL MEMBERSHIPS

- 2006 – Present The American Statistical Association, Member.
- 2006 – Present International Biometric Society, East North American Region Member.

GRANTS AND FUNDING (current and past)

- Under Revision Population Pharmacokinetic and Pharmacodynamic Models in the Presence of Outliers.
PI: Leena Choi, Ph.D.
- 10/01/2008 – Present Epithelial Dysfunction in Early Idiopathic Pulmonary Fibrosis (IPF).
PI: Timothy Blackwell, M.D.
Role: Biostatistician

- 04/01/2006 – Present A Novel Approach to Predict Energy of Physical Activity.
 PI: Maciej S. Buchowski, Ph.D.
 Role: Co-investigator
- 04/01/2006 – Present Physical Activity Energy Expenditure and Adolescent Obesity.
 PI: Maciej S. Buchowski, Ph.D.
 Role: Co-investigator
- 10/01/2006 – Present Autonomic Nervous System in Chronic Fatigue Syndrome.
 PI: Italo Biaggioni, M.D.
 Role: Biostatistician
- 07/01/2008 – Present Systemic and Localized Stress Resilience in Aging: Effects of Physical Fitness.
 PI: Sean Davies, Ph.D.
 Role: Biostatistician
- 07/01/2007 – 07/31/2008 Genes Controlling Assembly and Function of Serotonin Systems.
 PI: Randy Blakely, M.D.
 Role: Biostatistician
- 10/01/2007 – 06/30/2008 Determinants of Individual Responsiveness to Drugs.
 PI: Michael Stein, M.D.
 Role: Biostatistician

PEER REVIEWED PUBLICATIONS

- Lokker, N., Sanders, L., Perrin, E., Kumar, D., Finkle, J.P., Franco, V., **Choi, L.**, Johnston, P., and Rothman, R. Parental Misinterpretations of Over-the-Counter Pediatric Cough and Cold Medication Labels. *Pediatrics*, 123: 1464-1471, 2009.
- Powers, J.S., **Choi, L.**, Bitting, R., Gupta, N., Buchowski, M. Rapid measurement of total body water to facilitate clinical decision making in hospitalized elderly patients. *J Gerontol A Biol Sci Med Sci*, 64: 664-669, 2009.
- Buchowski, M.S., **Choi, L.**, Majchrzak K.M., Acra, S., Matthews, C.E., Chen K.Y. Seasonal changes in amount and patterns of physical activity in women. *Journal of Physical Activity and Health*, 6:252-261, 2009.
- Choi, L.**, Caffo, B. and Rohde, C. A survey of the likelihood approach to bioequivalence trials. *Statistics in Medicine*, 27(24):4874-4894, 2008.
- Rothney, M., Schaefer, E., Neumann, M., **Choi, L.** and Chen, K., Validity of physical activity intensity predictions by ActiGraph, Actical, and RT3 accelerometers. *Obesity*, 16(8):1946-52, 2008.
- Powers, J.S., Roberts, L.J. 2nd, Tarvin, E., Hongu, N., **Choi, L.**, Buchowski, M. Oxidative stress and multi-organ failure in hospitalized elderly people. *Journal of the American Geriatrics Society*, 56(6):1150-1152, 2008.

Dorminy, C.A., **Choi, L.**, Akohoue, S.A., Chen, K.Y. and Buchowski, M.S. Validity of a multisensor armband in estimating 24-h energy expenditure in children. *Medicine & Science in Sports & Exercise*, 40(4):699-706, 2008.

Cao, Y.J., Caffo, B., **Choi, L.**, Radebaugh, C.L., Fuchs E.J. and Hendrix, C.W. Noninvasive quantitation of drug concentration in prostate and seminal vesicles: improvement and validation with desipramine and aspirin. *Journal of Clinical Pharmacology*, 48(2):176-183, 2008.

Choi, L., Caffo, B., Rohde, C., Ndovi, T.T. and Hendrix, C.W. A Mechanistic latent variable model for estimating drug concentrations in the male genital tract: a case study in drug kinetics. *Statistics in Medicine*, 27(14):2697-2714, 2008.

Choi, L., Caffo, B. and Rohde, C. Optimal sampling times in bioequivalence studies using a simulated annealing algorithm. *Statistics and Computing*, 17:337-347, 2007.

Ho, R.H., **Choi, L.**, Lee, W., Mayo, G., Schwarz, U.I., Tirona, R.G., Bailey, D.G., Stein, C.M. and Kim, R.B., Effect of drug transporter genotypes on pravastatin disposition in European- and African-American subjects. *Pharmacogenetics and Genomics*, 17(8):647-56, 2007.

Eckerle, L.D., Lu, X., Sperry, S.M. **Choi, L.** and Denison, M.R. High fidelity of murine coronavirus replication is decreased in exoribonuclease mutants. *Journal of Virology*, 81(22):12135-44, 2007.

Shibao, C., Raj, S.R., Gamboa, A., Diedrich, A., **Choi, L.**, Black, B.K., Robertson, D. and Biaggioni, I. Norepinephrine transporter blockade with atomoxetine induces hypertension in patients with impaired autonomic function. *Hypertension*, 50(1):47-53, 2007.

Shibao, C., Gamboa, A., Diedrich, A., Dossett, C., **Choi, L.**, Farley, G. and Biaggioni, I. Acarbose, an alpha-glucosidase inhibitor, attenuates postprandial hypotension in autonomic failure. *Hypertension*, 50(1):54-61, 2007.

Kurnik, D., Muszkat, M., Friedman, E.A., Sofowora, G.G., Diedrich, A., Xie, H.G., Harris, P.A., **Choi, L.**, Wood, A.J. and Stein, C.M. Effect of the alpha2C-adrenoreceptor deletion322-325 variant on sympathetic activity and cardiovascular measures in healthy subjects. *Journal of Hypertension*, 25(4):763-771, 2007.

Gamboa, A., Shibao, C., Diedrich, A., **Choi, L.**, Pohar, B. Jordan, J., Paranjape, S., Farley, G. and Biaggioni, I. Contribution of endothelial nitric oxide to blood pressure in humans. *Hypertension*, 49(1): 170-177, 2007.

Ndovi, T.T., Parsons, T., **Choi, L.**, Caffo, B., Rohde, C. and Hendrix, C.W. A new method to quantitatively estimate seminal vesicle and prostate gland contributions to ejaculate. *British Journal of Clinical Pharmacology*, 63 (4), 404-420, 2007.

Ndovi, T.T., **Choi, L.**, Caffo, B., Parsons, T., Baker, S., Zhao, M., Rohde,

C. and Hendrix, C.W. Quantitative assessment of seminal vesicle and prostate drug concentrations by use of a noninvasive method. *Clinical Pharmacology and Therapeutics*, 80(2): 146-158, 2006.

Choi, L., Dominici, F., Zeger, S.L. and Ouyang, P. Estimating treatment efficacy over time: a logistic regression model for binary longitudinal outcomes. *Statistics in Medicine*, 24:2789-2805, 2005.

Oswald, L.M., Wong, D.F., McCaul, M., Zhou, Y., Kuwabara, H., **Choi, L.**, Brasic, J. and Wand, G.S. Relationships among ventral striatal dopamine release, cortisol secretion and subjective responses to amphetamine. *Neuropsychopharmacology*, 30(4):821-832, 2005.

Lawler, L.P., Horton, K.M., Scatarige, J.C., Phelps, J., Thompson, R.E., **Choi, L.** and Fishman, E.K. Coronary artery calcification scoring by prospectively triggered multidetector-row computed tomography: is it reproducible? *Journal of Computer Assisted Tomography*, 28(1):40-45, 2004.

Oswald, L.M., McCaul, M., **Choi, L.**, Yang, X. and Wand, G.S. Catechol-O-methyltransferase polymorphism alters hypothalamic-pituitary-adrenal axis responses to naloxone: a preliminary report. *Biological Psychiatry*, 55(1):102-105, 2004.

Uhart, M., McCaul, M., Oswald, L.M., **Choi, L.** and Wand, G.S. GABRA6 gene polymorphism and an attenuated stress response. *Molecular Psychiatry*, 9(11):998-1006, 2004.

Kim, C.K., Chung, H.S., Lee, M.K., **Choi, L.N.** and Kim, M.H. Development of dried liposomes containing β -galactosidase for the digestion of lactose in milk. *International Journal of Pharmaceutics* 183:185-193, 1999.

Lee, M.K., **Choi, L.**, Kim, M.H. and Kim, C.K. Pharmacokinetics and organ distribution of Cyclosporin A incorporated in liposomes and mixed micelles. *International Journal of Pharmaceutics*, 191:87-93, 1999.

PEER REVIEWED PUBLICATIONS (In Press)

Aslam, M., Eckhauser, A., Dorminy, C., Dossett, C., **Choi, L.** and Buchowski, M.S. Assessing body fat changes during moderate weight loss with anthropometry and bioelectrical impedance. *Obesity Research & Clinical Practice*.

PEER REVIEW PUBLICATIONS (Under Review)

Choi, L., Chen, K.Y., Acra, S.A., and Buchowski, M.S. Distributed lag and spline modeling for predicting energy expenditure from accelerometry in youth. *Journal of Applied Physiology*. (under revision)

Choi, L. and Dupont, W.D. Fisher's exact test and the foundations of statistical inference. *The American Statistician*.

Buchowski, M.S., Aslam, M., Dossett, C., Dorminy, C., **Choi, L.**, Acra, S.A. Effect of dairy and nondairy calcium on fecal fat excretion in lactose digester and

maldigester obese adults. *International Journal of Obesity*. (under revision)

Kohli, U., Pandharipande, P., Muszkat, M., Sofowora, G.G., Friedman, E.A., Scheinin, M., Wood, A.J.J., Ely, W., Tyndale, R.F., **Choi, L.**, Stein, M. and Kurnik, D. CYP2A6 genetic variation and dexmedetomidine disposition. *Journal of Clinical Pharmacology*.

PEER REVIEW PUBLICATIONS (In Preparation)

Choi, L., Kohli, U., and Stein, M. A bayesian hierarchical nonlinear mixture model in the presence of informative outliers in a population pharmacokinetic study. (in preparation)

Choi, L., Liu, Z., Matthews, C., and Buchowski, M.S. Improved algorithm to detect non-wear times. (in preparation)

TALKS, PRESENTATIONS AND POSTERS

November 12, 2008 **Choi, L.** A Bayesian Hierarchical Nonlinear Mixture Model in the Presence of Informative Outliers in a Population Pharmacokinetic Study. Vanderbilt University Department Biostatistics Seminar Series 2008-2009. Department of Biostatistics, Vanderbilt University School of Medicine.

July 17, 2008 **Choi, L.** Introduction to Bayesian Methods. Vanderbilt University Department Biostatistics MS Biostatisticians Workshop Series 2007-2008. Department of Biostatistics, Vanderbilt University School of Medicine.

May 16, 2008 **Choi, L.** Adaptive Bayesian Designs in Dose-finding Studies. Vanderbilt University VICC Cancer Biostatistics Workshop Series 2007-2008. Department of Biostatistics, Vanderbilt University School of Medicine.

April 23, 2008 **Choi, L.** A Bayesian Hierarchical Nonlinear Mixture Model in the Presence of Informative Outliers in a Population Pharmacokinetic Study. Johns Hopkins Department of Biostatistics Seminar Series 2007-2008. Department of Biostatistics, Johns Hopkins University Bloomberg School of Public Health.

March 18, 2008 **Choi, L.** Caffo, B. and Rohde, C. A Survey of the Likelihood Approach to Bioequivalence Trials. ENAR, Spring Meeting 2008 March 16-19, Arlington, VA.

November 07, 2007 **Choi, L.** P -values, Likelihoods and Measuring Statistical Evidence. Vanderbilt University Department Biostatistics Seminar Series 2007-2008. Department of Biostatistics, Vanderbilt University School of Medicine.

September 07, 2007 **Choi, L.** How to use Bayesian Methods in Clinical Research. Vanderbilt University GCRC Research Skills Workshop Series 2007-2008. Department of Biostatistics, Vanderbilt University School of Medicine.

March 31, 2006 Dupont, W.D. and **Choi, L.** The Conditionality Principle and 2x2 Contingency Tables: Some Thoughts on the Foundations of Statistical Inference.

Vanderbilt University Department Biostatistics Seminar Series 2005-2006. Department of Biostatistics, Vanderbilt University School of Medicine.

- November 01, 2005 **Choi, L.** Pharmacokinetics Pharmacodynamics, and Statistical Modelling. Grand Rounds in Clinical Pharmacology. Division of Clinical Pharmacology, Vanderbilt University School of Medicine.
- April 29, 2005 **Choi, L.** Introduction to Pharmacokinetics/Pharmacodynamics Modelling. (Poster) Department of Biostatistics 2005 Retreat. Department of Biostatistics, Johns Hopkins University Bloomberg School of Public Health.
- April, 2003 **Choi, L.**, Dominici, F. and Zeger, S.L. A logistic regression model for binary longitudinal outcomes: a case study for estimating efficacy of a stomach disorder treatment in clinical trials. Department of Biostatistics 2003 Retreat. Department of Biostatistics, Johns Hopkins University Bloomberg School of Public Health.
- February, 1997 Ok, C.S., Kang, C.S., Yoon, H.J., Park, S.H., Suh, S.K., Jang, S.Y., **Choi, L.** and Park, J.H. Evaluation for the Reference Standards of Glipizide and Glibenclamide. 1996 Research Presentation, Korea Food and Drug Administration.
- June, 1994 Kim, C.-K., **Choi, L.** and Chung, H.-S. Development of Dry Liposomes Containing β -Galactosidase for the Digestion of Lactose in Milk. (Poster) Liposome Research Days Conference - Liposomes: the Next Generation, University of British Columbia, Vancouver, Canada, 19 June - 22 June, 1994.

NON PEER REVIEWED PUBLICATIONS

Ok, C.S., Choi, B.K., Yoon, H.J., Kim, Y.O., Choi, L., Park, S.A., Choi, M. and Park, J.H. Evaluation for the Reference Standards of Furosemide and Spironolactone. The Annual Report of Korea Food and Drug Administration (1997).

Lee, S.H., Ok, C.S., Choi, B.K., Kim, Y.O., Choi, L., Park, S.A., Choi, M. and Kim, K.S. Instrumentation of Analytical Methods for Official Compendium Drugs(XII) : Determination of Acrinol by HPLC. The Annual Report of Korea Food and Drug Administration (1997).

Ok, C.S., Kang, C.S., Yoon, H.J., Park, S.H., Suh, S.K., Jang, S.Y., Choi, L. and Park, J.H. Evaluation for the Reference Standards of Glipizide and Glibenclamide. The Annual Report of Korea Food and Drug Administration (1996).

Kim, H.K., Ok, C.S., Kang, C.S., Park, S.H., Suh, S.K., Jang, S.Y., Choi, L., Kim, K.S. and Lee, K.C. Instrumentation of Analytical Methods for Official Compendium Drugs(XI) : Determination of Hydrocortisone Acetate and Diphenhydramine by HPLC. The Annual Report of Korea Food and Drug Administration (1996).

Ok, C.S., Kang, C.S., Kim, H.K., Park, S.H., Suh, S.K., Jang, S.Y., Choi, L.

and Park, J.H. Studies on the Preparation of Reference Standards for Antihypertensive Agents (Captopril and Enalapril maleate). The Annual Report of National Institute of Health (1995).

Kim, H.K., Ok, C.S., Kang, C.S., Park, S.H., Suh, S.K., Jang, S.Y., Choi, L., Kim, K.S. and Kim, S.K. Instrumentation of Analytical Methods for Official Compendium Drugs (X) : Determination of Isosorbide Dinitrate in Pharmaceutical Preparations by HPLC. The Annual Report of National Institute of Health (1995).

CONTINUOUS EDUCATION

- 1 – 6 August 2009 Applied Statistical Genetics for Population-Based Association Studies. One-Day Short Course. Joint Statistical Meetings. Washington, DC.
- 1 – 6 August 2009 Monte Carlo and Bayesian Computation with R. One-Day Short Course. Joint Statistical Meetings. Washington, DC.
- 30 January – 1 February 2008 Bayesian Biostatistics Conference. Houston, TX.
- 29 July – 2 August 2007 Practical Bayesian Clinical Trial Design. One-Day Short Course. Joint Statistical Meetings. Salt Lake City, UT.
- 1 – 30 November 2006 Human Genetic Research. VUMC Master of Science in Clinical Investigation. Vanderbilt University School of Medicine, Nashville, TN.
- 18 – 21 February 1998 The 30th Transmission Electron Microscopy Workshop. Transmission Electron Microscopy Society of Korea, Seoul, Korea.
- 24 – 26 September 1997 KSP and CRS Joint Symposium on Recent Advances in Drug Delivery and Biomaterials. Sheraton Walker Hill Hotel, Seoul, Korea.
- 6 – 8 August 1997 Radioisotope Correspondence Course Training. Korea Radioisotope Association, Seoul, Korea.
- 26 – 28 February 1997 Role of the Government in the Regulation of the Pharmaceutical Industry. Korean New Drug Development Research Association, Seoul, Korea.
- 11 – 15 November 1996 Computer Class for Government Officers. Samsung Information Technology Academy, Samsung Data System, Seoul, Korea.
- 12 – 13 October 1995 Ion Chromatography Special Workshop. Hewlett Packard, Young-In Scientific, Co., LTD., Seoul, Korea.
- 18 – 20 September 1995 Gas Chromatography Workshop. Hewlett Packard, Young-In Scientific, Co., LTD., Seoul, Korea.
- 1st September 1994 Personal Care Surfactants Seminar. Philippe Loll and Pam Jones, ICI Surfactants, Seoul, Korea.
- 14 – 18 February 1994 SAS Open Lecture. Statistics Research Institute of Seoul National University, Seoul, Korea.
- 6 – 7 August 1990 National Health Class for Health Society. The Pharmacists Association for Health Society, Seoul, Korea.

19 – 24 June 1989 Herbal Medicine Class. The Korean Scientific Herbal Medicine Institute, Seoul, Korea.