

CONTACT INFORMATION Department of Biostatistics University of Pittsburgh 130 De Soto Street Pittsburgh, PA 15261, USA *Phone:* 412-383-6812 *Fax:* 412-624-2183 *E-mail:* crkang@pitt.edu

RESEARCH INTERESTS Precision medicine, statistical methods in biomarker evaluation for treatment selection and risk prediction, mobile Health, statistical learning, empirical processes, statistical methods in HIV vaccine efficacy trials, moderation and mediation analysis, physical activity and neurocognitive health, and schizophrenia and human brain development study.

POSITIONS **Department of Biostatistics, Graduate School of Public Health University of Pittsburgh**  
*Assistant Professor (tenure-track)* January, 2015 - Present  
*Visiting assistant professor* September, 2014 - December, 2014

**Department of Biostatistics, Graduate School of Public Health University of Pittsburgh**  
*Visiting Assistant Professor* September, 2014 - December, 2014

**Comparative Effectiveness Research Center (CERC), University of Pittsburgh**  
*Biostatistician* March, 2015 - June 2016

**Hepatitis B Research Network (HBRN) Data Coordinating Center, University of Pittsburgh**  
*Biostatistician* September, 2014 - May 2015

**Fred Hutchinson Cancer Research Center, Seattle, WA**  
 Vaccine and Infectious Disease Division/ Public Health Sciences Division  
*Postdoctoral Research Fellow* September, 2011 - August, 2014  
 Supervisor: Dr. Ying Huang and Dr. Holly Janes

EDUCATION **The University of North Carolina at Chapel Hill, Chapel Hill, NC.**  
 PhD, Biostatistics, August 2011

- Thesis Topic: *New statistical learning methods for chemical toxicity data analysis*
- Adviser: Professor and Chair Michael R. Kosorok

**Ewha Womans University, Seoul, South Korea.**  
 MS, Statistics/ BS, Statistics

RESEARCH EXPERIENCE **University of North Carolina, Department of Biostatistics, Chapel Hill, NC**  
*Graduate Research Assistant*  
 Supervisor: Professor and Chair Michael R. Kosorok

**University of North Carolina, UNC Schizophrenia Research Center, Chapel Hill, NC**  
*Graduate Research Assistant*  
 Supervisor: Professor Robert M. Hamer, John H. Gilmore, MD

**University of North Carolina, North Carolina Center for Children’s Healthcare Improvement (NC CCHI), Chapel Hill, NC**  
*Graduate Research Assistant*

Supervisor: Peter Margolis, MD, PhD

**Ewha Womans University**, Department of Statistics, Seoul, South Korea  
*Graduate Research Assistant*

PEER REVIEWED  
PUBLICATIONS:

**Published:**

1. Gilmore, J. H., Lin, W., Corouge, I., Vetsa, YSK, Smith, J.K., **Kang, C.**, Gu, H., Hamer, R. M., Lieberman, J. A. and Gerig, G. Early postnatal development of corpus callosum and corticospinal white matter assessed with quantitative tractography (2007). *American Journal of Neuroradiology*. 28:1789-1795.
2. Gilmore, J. H., Smith, L. C., Wolfe, H. M., Hertzberg, B. S., Smith, J. K., Chescheir, N. C., Evans, D. D., **Kang, C.**, Hamer, R. M., Lin, W. and others. Prenatal mild ventriculomegaly predicts abnormal development of the neonatal brain (2008). *Biological Psychiatry*. 64:1069–1076.
3. Knickmeyer, R. C., Gouttard, S., **Kang, C.**, Evans, D., Wilber, K., Smith, J. K., Hamer, R. M., Lin, W., Gerig, G. and Gilmore, J. H. A structural MRI study of human brain development from birth to 2 years (2008). *Journal of Neuroscience*. 28(47):12176–12182.
4. Mukherjee, N., **Kang, C.**, Wolfe, H. M., Hertzberg, B. S., Smith, J. K., Lin, W., Gerig, G., Hamer, R. M. and Gilmore, J. H. Discordance of prenatal and neonatal brain development in twins (2009). *Early human development*. 85:171–175.
5. Knickmeyer, R. C., Styner, M., Short, S. J., Lubach, G. R., **Kang, C.**, Hamer, R., Coe, C. L. and Gilmore, J. H. Maturational Trajectories of Cortical Brain Development through the Pubertal Transition: Unique Species and Sex Differences in the Monkey Revealed through Structural Magnetic Resonance Imaging (2010). *Cerebral Cortex*. 20(5):1053–1063, doi:10.1093/cercor/bhp166
6. Gilmore, J. H., **Kang, C.**, Evans, D. D., Wolfe, H. M., Smith, M. D., Lieberman, J. A., Lin, W., Hamer, R. M., Styner, M. and Gerig, G. Prenatal and Neonatal Brain Structure and White Matter Maturation in Children at High Risk for Schizophrenia (2010). *American Journal of Psychiatry*. 167(9): 1083–1091, doi:10.1176/appi.ajp.2010.09101492
7. Rebecca C. Knickmeyer, **Chaeryon Kang**, Sandra Woolson, Keith J. Smith, Robert M. Hamer, Weili Lin, Guido Gerig, Martin Styner, John H. Gilmore. Twin-Singleton Differences in Neonatal Brain Structure (2011). *Twin research and human genetics: the official journal of the International Society for Twin Studies*. 14(3):268-276, doi:10.1375/twin.14.3.268
8. **Kang, C.**, Zhu, H., Wright, F. A., Zou, F., and Kosorok, M. R. The Interactive Decision Committee for Chemical Toxicity analysis (2012). *Journal of Statistical Research*, 46(2) (Special Issue on Biostatistics) :157–186.  
(<http://publications.isrt.ac.bd/index.php/jsr/article/view/8/7>)
9. **Kang, C.**, Qaqish, B., Monaco, J., Sheridan, S., and Cai, J. Kappa statistic for clustered dichotomous responses from physicians and patients (2013). *Statistics in Medicine*, 32 (21): 3700-3719 doi:10.1002/sim.5796
10. **Chaeryon Kang**, Holly Janes, and Ying Huang. Combining biomarkers to optimize patient treatment recommendation (2014). *Biometrics*, 70(3): 695-707. **(with discussion)**
11. **Chaeryon Kang**, Ying Huang, and Christopher J. Miller. A discrete time survival model with random effects for designing and analyzing repeated low-dose challenge experiments (2015). *Biostatistics*, 16(2): 295–310. doi:10.1093/biostatistics/kxu040
12. Jane N. Kogan, James Schuster, Cara Nikolajski, Patricia Schake, Tracy Carney, Sally C. Morton, **Chaeryon Kang**, and Charles F. Reynolds III. Patient-Centered Comparative Effectiveness Study of Optimal Health Interventions for Adults with Serious Mental Illness: Study Design and Implementation (2017). *Clinical Trials*, 14 (1): 5–16. doi:10.1177/1740774516670895'

13. Faina Linkov, Amin Sanei-Moghaddam, Robert P. Edwards, Paula J. Lounder, Naveed Ismail, Sharon L. Goughnour, **Chaeryon Kang**, Suketu M. Mansuria, and John T. Comerci. Implementation of Hysterectomy Pathway: Impact on Complications (2017). *Women's Health Issues*, 27(4):493-498. doi:10.1016/j.whi.2017.02.004
14. Sara M. Clifton, **Chaeryon Kang**, Jingyi Jessica Li, Qi Long, Nirmish Shah, and Daniel M. Abrams. Hybrid statistical and mechanistic mathematical model guides mobile health intervention for chronic pain (2017). *Journal of Computational Biology*, 24(7):675-688. doi:10.1089/cmb.2017.0059
15. Charles R. Jonassaint, **Chaeryon Kang**, Jude C. Jonassaint, Laura De Castro, Daniel M. Abrams, Jingyi Jessica Li, Jason Mao, Yimeng Jia, Qi Long, and Nirmish Shah. Understanding Patterns and Correlates of Daily Pain using the Sickle Cell Disease Mobile Application to Record Symptoms via Technology (SMART)(2018). *British Journal of Haematology*, 183(2): 306-308. doi:10.1111/bjh.14956
16. Amin Sanei-Moghaddam, **Chaeryon Kang**, Robert P. Edwards, Paula J. Lounder, Naveed Ismail, Sharon L. Goughnour, Suketu M. Mansuria, John T. Comerci, and Faina Linkov. Racial and Socioeconomic Disparities in Hysterectomy Route for Benign Conditions (2018). *Journal of Racial and Ethnic Health Disparities*, 5(4): 758-765. doi:10.1007/s40615-017-0420-7
17. **Chaeryon Kang**, Holly Janes, Parvin Tajik, Henk Groen, Ben W. J. Mol, Corine M. Koopmans, Kim Broekhuijsen, Eva Zwertbroek, Maria G. van Pampus, and Maureen T M Franssen. Evaluation of biomarkers for treatment selection using individual participant data from multiple clinical trials (2018). *Statistics in Medicine*, 37(9):1439-1453. doi:10.1002/sim.7608
18. James Schuster, Cara Nikolajski, Jane N. Kogan, Patricia Schake, **Chaeryon Kang**, Tracy Carney, and Charles F. Reynolds III. A Payer-Guided Approach to Widespread Diffusion of Behavioral Health Homes in Real-World Settings (2018). *Health Affairs*, 37(2):248-256 (invited for the special issue on diffusion of innovation) doi:10.1377/hlthaff.2017.1115
19. Stillman, C.M., Donahue, P.T., Williams, M.F., Callas, M., Lwanga, C., Brown, C., Wollam, M. E., Jedrzejewski, M.K., **Kang, C.**, Erickson, K.I. Weight loss outcomes in a pilot trial of African Dance in older African Americans (2018). *Obesity*, 26(12):1893-1897. doi:10.1002/oby.22331
20. Jonassaint, C. R., **Kang, C.**, Prussien, K. , Yarboi, J. and Sanger, M. Feasibility of Implementing Mobile Technology-Delivered Mental Health Treatment in Routine Adult Sickle Cell Disease Care (2018). *Translational Behavioral Medicine*, iby107. doi:10.1093/tbm/iby107 (\*) indicates students under supervision

NON-REFERRED  
PUBLICATIONS:

1. **Chaeryon Kang**, Holly Janes, and Ying Huang. **Rejoinder:** Combining biomarkers to optimize patient treatment recommendation (2014). *Biometrics*, 70(3): 695-707.

PUBLISHED  
ABSTRACTS

1. Gilmore, JH and Lin, W and Evans, DD and **Kang, C** and Hamer, RM and Smith, JK and Lieberman, JA and Gerig, G. Early brain development in children at high risk for schizophrenia (2007). *SCHIZOPHRENIA BULLETI*, 33(2),333-333.
2. Kayvon Salimi, L. Fredrik Jarskog, Lin Sikich, **Chaeryon Kang**, Robert M. Hamer, Brian B. Sheitman, John E. Kraus, John H. Gilmore. Addition of lamotrigine to antipsychotic is associated with reduced positive symptoms early in the course of schizophrenia (2009). *Biological Psychiatry*, 65 (8):210S-210S.
3. Norah Terrault, Marc G. Ghany, **Chaeryon Kang**, Stewart Cooper, Adrian M Di Bisceglie, Michael W. Fried , Steven H Belle, Jay H Hoofnagle. Seroprevalence and Clinical Features of Hepatitis D Virus (HDV) Infection in a North American Cohort (2015). *American Association for the Study of Liver Diseases(AASLD) LiverLearning*, 110842.

- SOFTWARE DEVELOPED R-package to analyze the data from repeated low-dose (RLD) challenge experiments for evaluating effect of vaccine. “Designing and Analyzing Repeated Low-Dose Challenge Experiments” (2017), Bin Yao, Ying Huang, and **Chaeryon Kang** (CRAN Download).
- GRANT SUPPORT NIH, U01 DK082864, Hepatitis B Clinical Research Network- Data Coordinating Center (PI: Belle), 09/30/08 – 05/31/15 (role: statistician)
- PCORI 673, Optimizing Behavioral Health Homes by Focusing On Outcomes That Matter Most for Adults with Serious Mental Illness (PI: Schuster), 5/1/13 – 5/31/17 (role: co-I).
- PCORI 402, Amplifying the Patient’s Voice: Person-Centered Versus Measurement-Based Approaches in Mental Health (PI: MacDonald-Wilson), 4/1/14 – 2/28/18 (role: co-I)
- NSF 1557765, QuBBD: Advancing mHealth using Big Data Analytics: Statistical and Dynamical Systems Modeling of Real-Time Adaptive m-Intervention for Pain (PI: Abrams, **Kang**, Long, Shah, and Li), 9/15/15 – 8/31/16 (role: PI).
- NIH, R01, 1R01AG053952-01, IGNITE: Investigating Gains in Neurocognition in an Intervention Trial of Exercise (PI: Erickson), 9/15/16 – 8/31/21 (role: co-I).
- NIH, R01, NIH 1R01AR069503, Predicting the Outcome of Exercise Therapy for Treatment of Rotator Cuff Tears (PI: Debski, Scott, Irragang) 7/1/16 – 8/31/17 (role: statistician).
- PCORI 1609-36670, Leveraging Integrated Models of Care to Improve Patient-Centered Outcomes for Publicly-Insured Adults with Complex Health Care Needs (PI: Schuster) 01/01/18–12/31/21 (role: co-I)
- NIH P01, 2P01HL040962-21A1, eBACH: Biobehavioral studies of cardiovascular disease (PI: Gianaro) 08/15/18 – 06/30/23 (role: co-I).
- Central Research Development Fund (CRDF), University of Pittsburgh, Estimation of optimal individualized treatment rule balancing multiple patient outcomes (PI: **Kang**) 09/01/18 – 06/30/20 (role: PI).
- NIH, R01, 1R01AG060741-01, REACT: Rhythm Experience and African Culture Trial (PI: Erickson), 09/01/18 – 05/31/23 (role: co-I).
- NIH, R01, 1R01AG060050-01A1, AIM-IGNITE: Antioxidant imaging marker of investigating gains in neurocognition in an intervention trial of exercise (PI: Lee), 02/15/19 – 11/30/22 (role: statistician).
- INVITED PRESENTATIONS
1. “Change-line classification and regression for chemical toxicity analysis.”, *Bioinformatics and Computational Biology Seminar*, February 2011, MD Anderson Cancer Center, TX.
  2. “Change-line classification and regression for chemical toxicity analysis.”, *Biostatistics and Bioinformatics Branch Seminar*, February 2011, Division of Epidemiology, Statistics, and Prevention Research, National Institute of Child Health and Human Development (NICHD), MD.
  3. “Change-line classification and regression for chemical toxicity analysis.”, *Vaccine and Infectious Disease Division Seminars*, March 2011, Vaccine and Infectious Disease Division and Public Health Sciences Division, Fred Hutchinson Cancer Research Center, WA.
  4. “Combining biomarkers to optimize patient treatment recommendations.”, Section of “Evaluating biomarker predictive models”, *The International Biometric Society Western North American Region (WNAR) Annual Meeting*, June 2013, University of California Los Angeles, CA.

5. “Advancing mHealth using Big Data Analytics: Statistical and Dynamical Systems Modeling of Real-Time Adaptive m-Intervention for Pain”, Topic-contributed, Section of “The NSF/NIH/SAMSI Workshop on Interdisciplinary Approaches to Biomedical Data Science Challenges”, *Joint Statistical Meetings (JSM)*, July 2016, Chicago, IL.
6. “Hybrid statistical and mechanistic mathematical model guides mobile health intervention for chronic pain”, February 2017, Department of Statistics, University of Pittsburgh, PA.
7. “Statistical and Dynamical Systems Modeling of m-Intervention for Pain”, March 2017, CRISMA BDMC Speaker Series, Department of Critical Care Medicine, Pittsburgh, PA.
8. “Statistical and Dynamical Systems Modeling of m-Intervention for Pain”, Invited, Section of “Extraordinary possibility for Mobile Health to Impact Precision Medicine”, *The International Biometric Society Eastern North American Region Spring Meeting (ENAR)*, March 2017, Washington, DC.
9. “Statistical and Dynamical Systems Modeling of m-Intervention for Pain”, Invited, Section of “EO122: Recent developments on dynamic treatment regimes”, *International Conference on Econometrics and Statistics (EcoSta)*, June 2017, The Hong Kong University of Science and Technology, Hong Kong.
10. “Hybrid Statistical and Dynamical Systems Modeling Guides mHealth Intervention for Pain”, April 2018, Biostatistics Seminar Talk, Division of Biostatistics, Institute for Health and Society, Medical College of Wisconsin, Milwaukee, WI.
11. “Hybrid statistical and mechanistic mathematical model guides mobile health intervention for chronic pain”, February 18 - 22, 2019, Statistical Methods for Developing Personalized Mobile Health Interventions: Workshop on Design of mHealth Intervention Studies. Institute for Mathematical Sciences National University of Singapore (NUS), Singapore.

CONTRIBUTED  
PRESENTATIONS

1. “Change-line classification and regression for chemical toxicity data.”, *ENAR*, March 2010, New Orleans, LA.
2. “Change-line classification and regression for chemical toxicity data.”, *Joint Statistical Meetings (JSM)*, August 2010, Vancouver, BC, Canada.
3. “The interactive decision committee for chemical toxicity analysis.”, *ENAR*, March 2011, Miami, FL.
4. “Identifying combinations of biomarkers for treatment selection.”, *JSM*, August 2012, San Diego, CA.
5. “A discrete survival model with random effect for designing and analyzing repeated low-dose challenge experiment.”, *ENAR*, March 2013, Orlando, FL.
6. “Identifying immune response combinations associated with heterogeneous infectious risk in HIV vaccine studies.”, *JSM*, August 2013, Montréal, QC, Canada.
7. “Combining biomarkers to optimize patient treatment recommendations.”, *ENAR*, March 2014, Baltimore, MD.
8. “Evaluation of biomarkers for treatment selection using individual participant data meta-analysis.”, *JSM*, August 2015, Seattle, WA.
9. “Evaluation of biomarkers for treatment selection using individual participant data meta-analysis.”, *ENAR*, March 2016, Austin, Texas.
10. “Inference and optimal design for longitudinal cluster-randomized clinical trials given a small number of clusters with application to a serious mental illness intervention study”, *JSM*, July 2018, Vancouver, BC, Canada.

DEPARTMENTAL PRESENTATIONS 1. "A discrete time survival model with random effect for designing and analyzing repeated low-dose challenge experiment.", *P01 Statistical Methods Collaboration Seminar*, April 2013, Fred Hutchinson Cancer Research Center, WA.

2. "Prepare towards a faculty position.", *Academic career workshop: Roadmap towards academic research*, May 2017, Department of Biostatistics, University of Pittsburgh, PA.

TEACHING EXPERIENCE **University of Pittsburgh**, Department of Biostatistics, Pittsburgh, PA, USA  
Statistical Estimation Theory (PhD-level core course for graduate students) Fall 2015  
Statistical Estimation Theory (PhD-level core course for graduate students) Fall 2016  
Biostatistics Seminar Fall 2016  
Biostatistics Seminar Spring 2017  
Statistical Estimation Theory (PhD-level core course for graduate students, 20) Fall 2017  
Biostatistics Seminar Fall 2017  
Biostatistics Seminar Spring 2018  
Statistical Estimation Theory (PhD-level core course for graduate students, 7) Fall 2018

**University of North Carolina**, Department of Biostatistics, Chapel Hill, NC, USA  
Principles of Statistical Inference (Teaching assistant)  
Principles of Statistical Inference (Teaching assistant)

**Ewha Womans University**, Department of Statistics, Seoul, South Korea  
Mathematical statistics I (Teaching assistant)  
Mathematical statistics II (Teaching assistant)  
Measure and probability (Teaching assistant)

OTHER PROJECTS **Understanding the Niche of Care: A prospective analysis of the management of inpatient diabetes mellitus patients admitted at UNC Hospital**  
Investigators: Arocena, C. L., and DeCherney, S. MD, MPH  
Statistical analysis plan

**Study Report: Prevention of Postpsychotic Depression with Lamotrigine**  
Investigators: John H. Gilmore, MD  
Statistical data analysis

**Cystic Fibrosis Improvement Project**  
Investigators: Peter Margolis, MD, PhD  
Longitudinal data analysis to study effect of interventions for Cystic fibrosis clinics.

**EMS and Hospital environmental project**  
Investigators: Peter Margolis, MD, PhD  
Statistical data analysis to study EMS system and hospital environments.

HONORS & AWARDS **Fred Hutchinson Cancer Research Center**  
The Student/Postdoc Advisory Committee (SPAC) Course Scholarship

**University of Washington, Department of Biostatistics**  
Summer Institute in Statistics and Modeling in Infectious Diseases Scholarship

**University of North Carolina, Department of Biostatistics, Chapel Hill**  
Student travel award

**Ewha Womans University**  
• Ewha Graduate Research Fellowship  
• MAGNA CUM LAUDE

- DEAN's LIST (Junior)
- Honors Scholarship, The College of Natural Science

STUDENT  
SUPERVISION

**Thesis Advising**

- Xiaotian Gao (PhD. student-Biostatistics), co-advising with Dr. Wahed November 2016–Present
- Anran Liu (PhD. student-Biostatistics) September 2018–Present

**Academic Advising**

- Di Zhang (PhD. student -Biostatistics) September 2015–December 2016
- Jian He (PhD. student-Biostatistics) September 2017–June 2018
- Xueping Zhou (PhD. student-Biostatistics) September 2018–Present

**Research Assistants Supervision**

- Di Zhang (PhD. student-Biostatistics) September 2015–Present
- Jian He (PhD. student-Biostatistics) September 2017–June 2018
- Xueping Zhou(PhD. student-Biostatistics) September 2018–Present

PROFESSIONAL  
SERVICES

**Editorial Board:** Journal of Health Informatics and Statistics March 2013 –February 2016

**Reviewer:** Annals of Statistics (2013–), Statistics in Medicine (2013–), Clinical Trials (2013–), Journal of the American Statistical Association (2015–), Biometrics (2015–), Contemporary Clinical Trials Communications (2016–), Journal of Biopharmaceutical Statistics (2016–), BMC Medical Research Methodology (2016–), Statistica Sinica (2016–), Biometrical Journal (2017–), Electronic Journal of Statistics (2017–),Sankhya B: The Indian Journal of Statistics (2018–), Communications in Statistics (2019–)

**Conferences/Workshops**

- Session chair, Section of “Methods for comparative effectiveness research using electronic health records” (invited paper), ENAR 2016.
- Organizer & chair, Section of “Extraordinary possibilities for mobile health to impact precision medicine” (Invited paper), JSM 2016.
- Organizer, Section of “Extraordinary possibilities for mobile health to impact precision medicine” (Invited paper), ENAR 2017.

**University of Pittsburgh service**

- Health and Wellness Committee, Graduate School Public Health January 2015 – May 2017
- Reviewer, the Central Research Development Fund (CRDF) May 2016
- Faculty judge, Dean’s Day Poster Competition April 2015, 2016,2018
- Information Technology Committee, Department of Biostatistics January 2015 –Present
- Curriculum Committee, Department of Biostatistics September 2015 –Present
- Webpage Committee, Department of Biostatistics January 2016 –Present
- Ad-hoc Committee member (problem submission and grading), PhD Comprehensive exam Part I (Theory) 2015, 2016, 2017, 2018, 2019
- Faculty judge, ENAR Student Presentation Evaluation, Department of Biostatistics March, 2015, 2016, 2017
- Faculty judge, Biostatistics Research day Student Presentation award competition, Department of Biostatistics March, 2018, 2019
- Coordinator, Department of Biostatistics seminar series Fall 2016–Summer 2018
- Coordinator, Biostatistics Student Research day March, 2017
- Dissertation Committees:
  - Andrew Topp (graduated, PhD in Biostatistics; Dr.Wahed) April, 2016
  - Zhaowen Sun (graduated, PhD in Biostatistics; Dr.Chang) April, 2017 - August, 2017
  - John R. Pleis (graduated, PhD in Biostatistics; Dr.Anderson) September, 2015 - May,

2018  
 - Di Zhang (graduated, PhD in Biostatistics; Dr. Jeong) December, 2018 - April 2019  
 - Chenxin Yang (graduated, MS in Biostatistics; Dr. Tang) April, 2019  
 - Victor Talisa (PhD. candidate -Biostatistics; Dr. Chang) December, 2018

WORK Amway Korea Line, Seoul, South Korea  
 EXPERIENCE Mirae Credit Information Services Corp., Seoul, South Korea

PROFESSIONAL American Statistical Association 2008 - Present  
 MEMBERSHIPS Eastern North American Region, The International Biometric Society 2009 - Present  
 Western North American Region, The International Biometric Society 2013 - 2014  
 Korean International Statistical Society 2015 - Present

SKILLS &  
 CERTIFICATION

**Skills**

- Proficient in SAS and R
- Familiar with C, C++; some knowledge of Unix shell scripting and MATLAB

**Certification**

- Causal Inference (Instructors: Drs. Michael G. Hudgens and Thomas Richardson), Summer Institute in Statistics and Modeling in Infectious Diseases (SISMID), University of Washington, July, 2012
- Prognostic Biomarker Evaluation (Instructor: Dr. Patrick Heagerty), Summer Institute in Statistics for Clinical Research (SISCR), University of Washington, June, 2014
- Advanced Topics in the Design of Clinical Trials (Instructor: Dr. Thomas Fleming), Summer Institute in Statistics for Clinical Research (SISCR), University of Washington, June, 2014
- An Introduction to Causal Inference (Instructors: Drs. *Hernán*, Lok, Tchetgen Tchetgen, Robins, VanderWeele), Short Course in the HSPH Program on Causal Inference, Departments of Biostatistics and Epidemiology at the Harvard T.H. Chan School of Public Health. June 4-8, 2018.