BIOGRAPHICAL SKETCH

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NAME: Hang Lee

eRA COMMONS USER NAME (credential, e.g., agency login): HANGL1

POSITION TITLE: Associate Professor of Medicine, Harvard Medical School,
Associate Biostatistician, Massachusetts General Hospital

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.*)

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	Completion Date MM/YYYY	FIELD OF STUDY
Korea University, Seoul, Korea	B.E. (Econ)	02/1983	Statistics
Univ. of Southern California, Los Angeles, CA	M.S.	05/1988	Biometry
Univ. of Southern California, Los Angeles, CA	Ph.D.	05/1994	Biometry
Harvard School of Public Health, Boston, MA	Post-doc.	06/1996	Biostatistics

A. Personal Statement

I have had extensive collaborative research experience with the clinical departments and research programs in academic medical centers. This has involved; 1) cooperative group coordinating **center lead statistician** role for **national multi-center clinical trials**; and 2) **collaboration with study teams and individual investigators** on designing clinical studies. I currently serve as **Associate Director of the Harvard Center for Translational and Clinical Science (Catalyst) at MGH** and **Lead Statistician for the MGH Division of Clinical Research (DCR) Biostatistics Unit** to lead and oversee all MGH/Harvard investigator initiated statistical design- and data analysis consulting projects. Relevant sample publication list demonstrating my statistical leadership for the multi-center clinical trials is shown below.

1. Finkelstein JS, **Lee H**, Karlamangla A, Neer RM, Sluss PM, Burnett-Bowie SM, Darakananda K, Donahoe PK, Harlow SD, Prizand SH, Joffe H, Kumar A, Martin DE, McConnell D, Merrilat S, Morrison A, Pastore LM, Randolph JF, Greendale GA, Santoro N. Antimullerian Hormone and Impending Menopause in Late Reproductive Age: The Study of Women's Health Across the Nation. J Clin Endocrinol Metab. 2020 Apr 01; 105(4).
2. Finkelstein JS, **Lee H**, Burnett-Bowie SA, Pallais JC, Yu EW, Borges LF, Jones BF, Barry CV, Wulczyn KE, Thomas BJ, Leder BZ. Gonadal steroids and body composition, strength, and sexual function in men. N Engl J Med. 2013 Sep 12; 369(11):1011-22; PMCID: PMC4142768.
3. Hoffmann U, Truong QA, Schoenfeld DA, Chou ET, Woodard PK, Nagurney JT, Pope JH, Hauser TH, White CS, Weiner SG, Kalanjian S, Mullins ME, Mikati I, Peacock WF, Zakroysky P, Hayden D, Goehler A, **Lee H**, Gazelle GS, Wiviott SD, Fleg JL, Udelson JE. Coronary CT angiography versus standard evaluation in acute chest pain. N Engl J Med. 2012 Jul 26; 367(4):299-308.
4. **Lee H**, Finkelstein JS, Miller M, Comeaux SJ, Cohen RI, Leder BZ. Effects of selective testosterone and estradiol withdrawal on skeletal sensitivity to parathyroid hormone in men. J Clin Endocrinol Metab. 2006 Mar; 91(3):1069-75.

B. Positions and Honors

1987–1994 Biostatistician, Univ. of Southern California School of Medicine, Los Angeles, CA
1994–1996 Research Fellow in Biostatistics, Harvard School of Public Health, Boston, MA
1996–1998 Instructor in Psychiatry, Harvard Department of Psychiatry, Boston, MA

1996–1998	Statistical Consultant, Behavioral Science Research Program Frontier Science and Technology Research Foundation, Chestnut Hill, MA
1996–2006	Statistical Consultant, College Alcohol Study, Department of Society, Human Development, and Health, Harvard School of Public Health, Boston, MA
1998–2001	Assistant Professor, UCLA School of Medicine, Los Angeles, CA
1998–2001	Director of Biostatistics, UCLA Center for Vaccine Research, Torrance, CA
2001–2017	Assistant Professor of Medicine, Harvard Medical School and MGH Biostatistics Center, Boston, MA
2018–Present	Associate Professor of Medicine, Harvard medical School and MGH Biostatistics Center, Boston, MA

Editorial Boards/Reviewers

2001–Present	Editorial Board (2001–2010) and Statistical Reviewer (2001–present), Journal of Clinical Endocrinology and Metabolism
2001–Present	Statistical Reviewer, Journal of Clinical Endocrinology and Metabolism
2008–Present	Statistical Consultant, Physical Therapy Journal
2001–Present	Ad-hoc Reviewer, Statistics in Medicine,
2001–Present	Ad-hoc Reviewer, Clinical Trials
2001–Present	Ad-hoc Reviewer, Journal of Quality of Life
2017–Present	Statistical Editorial Board, Journal of American Society of Echocardiography (JASE)
2018–Present	Statistical Editorial Board, Journal of Clinical Psychiatry (JCP)
2018–Present	Statistical Reviewer, Journal of Bone Mineral Metabolism (JBMR)

Federal Grant Review Panel

2006	Centers for Disease Control and Prevention (CDC) Special Emphasis Panel on Industrial Costs of Developing and Commercializing Childhood Vaccines
2011–Present	Centers for Disease Control and Prevention (CDC) Special Emphasis Panel on National Spina Bifida Registry
2012, 2016, 2017	Health Services Organization and Delivery (HSOD) Study Section, National Institutes of Health (NIH)
2014	Centers for Disease Control and Prevention (CDC) Special Emphasis Panel on Addressing Emerging Infectious Diseases in Bangladesh
2015	Centers for Disease Control and Prevention (CDC) Special Emphasis Panel on Economic Impact of Clinical Trials Among Children Diagnosed with Cancer
2015	Centers for Disease Control and Prevention (CDC) Special Emphasis Panel on Economic Costs of Quality Assurance in Lung Cancer Screening Program
2016–Present	Centers for Disease Control and Prevention (CDC) Global Health Special Emphasis Panel
2019–Present	NIH NCI Load Repayment Program (LRP)

C. Contributions to Science

1. **Robust Statistical Method for Complex Genetic and Longitudinal Analysis**: I developed a robust statistical and method to tackle classical statistical genetics problem using familial data to identify major genes causing or linked with complex disease phenotypes. While the maximum likelihood-based inference requiring full specification of multivariate likelihood function has been a known daunting task, this GEE (Generalized Estimating Equations)-based method-of-moment inference approach utilizes higher moments, and it is robust to misspecification of gene transmission, and gene-disease penetrance. This method is also applicable to the simultaneous inference of multivariate longitudinal (i.e., more than two related outcomes that are measured over multiple time points) mean and covariance models.
   a. **Lee H**, Stram DO. Segregation analysis of continuous phenotypes by using higher sample moments. Am J Hum Genet. 1996 Jan; 58(1):213-24.
   b. **Lee H**, Stram DO, Thomas DC. A generalized estimating equations approach to fitting major gene models in segregation analysis of continuous phenotypes. Genet Epidemiol. 1993; 10(1):61-74.
   c. Stram DO, **Lee H**, Thomas DC. Use of generalized estimating equations in segregation analysis of continuous outcomes. Genet Epidemiol. 1993; 10(6):575-9.
   d. Van Eerdewegh P, Santangelo SL, **Lee H**, Laird NM, Blacker D. Probabilistic diagnosis in linkage analysis of bipolar disorder: putting weights on the fringe. Genet Epidemiol. 1997; 14(6):693-8.

2. **Team Science**: Important contribution, as a generalist statistician, is to team up with other scientists and large study groups to accomplish their research aims. I have been instrumentally teamed with the following medical research teams:
   a. Cooperative Group Statistician (1998–2001) : 1) Director of Biostatistics and Data Management/co-investigator for Adult Pertussis Trial (APERT), an NIH funded large Phase III trial to evaluate efficacy and safety of an acellular pertussis vaccine among adolescents and adults; and 2) UCLA/Southern California site Co-investigator for Vaccine Safety Datalink (VSD), a CDC funded population based longitudinal cohort study of pediatric vaccine safety, both housed at UCLA Center for Vaccine Research
   b. Dana Farber/Harvard Cancer Statistician (2001–Present): To support over 20 Phase II cancer clinical trials (mostly late phase gynecologic cancers) housed at Dana-Farber Harvard Cancer Center (Role: Gynecologic Cancer Disease Program Lead Statistician)
   c. Cancer SPORE Biostatistics Core Statistician (2009–Present) - Glioma SPORE Biostatistics Core (Role: Statistician / MGH Core PI, 2019–Present); Ovarian SPORE Biostatistics Core (Role: Co-Leader, 2007–2017)
   d. MGH Clinical Research Center Statistician (2001- Present): To lead statistical design and monitoring over 10 federally funded clinical trials in collaboration with MGH Endocrine Unit (General Clinical Research Center)
   e. MGH OCT Registry Statistician (2010–Present):–To collaborate with a multi-center Optical Coherence Tomography (OCT) registry-based interventional cardiology study housed at MGH Cardiology Division
   f. MGH Infectious Disease Unit Statistician (2014–2017): To support simulation modeling studies to evaluate hospital infection control and outcomes (designing stochastic models, implementation, and advising junior investigators)
   g. Lead Statistician (2013–2018) and Associate Director (2018–Present) of Harvard Catalyst (CTSC) Biostatistics Program at MGH Site: To direct 300 consultations per year provided to the MGH-based Harvard Medical School faculty and fellow investigators
   h. Lead Statistician for MGH Division of Clinical Research Biostatistical Unit (2015–Present): To direct MGH-wide statistical consulting program (50 consultations per year) to support junior investigators

** Complete List of Published Work is available at:
http://www.ncbi.nlm.nih.gov/sites/myncbi/1DqQf6vTmg8kh/bibliograpahy/48518919/public/?sort=date&direction=ascending

D. Additional Information: Research Support and/or Scholastic Performance

01 UL1T R002541-01 (Nadler) 05/01/2018-04/30/2023

NIH
Harvard Clinical and Translational Science Center
The major goals of this project are to provide enriched resources to educate and develop the next generation of researchers trained in the complexities of translating research discoveries into clinical trials and ultimately into practice. Design new and improved clinical research informatics tools for analyzing research data and managing clinical trials. Support outreach to underserved populations, local community and advocacy organizations, and health care providers. Assemble interdisciplinary teams and forge new partnerships with private and public health care organizations.

5P30CA06516-54 (Benz) 12/01/2016-11/30/2021

NIH/NCI
Cancer Center Support Grant (Biostatistics CORE)
The major goals of this project are to support CORE activities that represent shared resources used by a variety of investigators in different labs throughout the DF/HCC. This is a subcontract through the Dana-Farber Cancer Institute

5R01DK103946-04 (Misra/Bredella) 08/06/2015-07/31/2020

NIH

Bone Metabolism in Adolescents Undergoing Bariatric Surgery

The proposal will examine the impact of RYGB and VSG on bone density, structure and strength over a two-year period in morbidly obese adolescents undergoing surgery compared to non-surgical obese adolescents.

5U01AG012531-25 (Finkelstein) 09/15/2014-06/30/2020

NIH/NIA

SWAN: The Study of Women's Health Across the Nation V

SWAN is a multicenter, longitudinal cohort study of women belonging to multiple racial and ethnic groups as they traverse the menopause. Topics to be studied include bone loss, cardiovascular risk factors, psychological changes, symptoms, hormonal profiles, bleeding patterns, sexuality, health care utilization, non-Western health practices, diet, exercise, and body composition.

2R24DK092759-08 (Klibanski/Rosen) 09/01/2015-08/31/2020

NIH/NIDKK

Interdisciplinary Study of Marrow Adiposity, Mineral Metabolism and Energy Balance

Marrow adipocytes have been identified as a component of the bone marrow micro-environment; their function, relevance to mineral metabolism and relationship to energy homeostasis has only recently been examined. We will use in vivo and in vitro systems to develop experimental paradigms for investigating this topic.

1 R01 DK114144-01A1 (Stanley) 05/15/2018-04/30/2023

NIH

Growth Hormone Releasing Hormone Analog to Improve Nonalcoholic Fatty Liver Disease and Associated Cardiovascular Risk

The major goals of this project are to investigate whether growth hormone releasing hormone, a treatment that increases growth hormone secretion, will reduce liver fat, liver damage, and cardiovascular disease risk in patients with NAFLD.

5R21AR069871-03 (Leder) 05/01/2016-04/30/2020

NIH/NIAMS

Consolidating skeletal benefits after short-term combination osteoporosis therapy: The DATA-EX study

The major goal of this project is the extension of a proof-of-principle clinical trial evaluating the efficacy of short-term therapy with a novel combination of osteoporosis medications followed by a single dose of a long-acting bisphosphonate.

2R01DK049302-22 (Grinspoon/Adler) 09/01/2016-08/31/2021

NIH/NIDKK

Effect of Mineralocorticoid Receptor Blockade on Coronary Vasculature and Myocardial Structure in HIV

This study is being conducted to test the efficacy of a selective mineralocorticoid blocker, eplerenone, on improving coronary flow, myocardial fibrosis, and atherosclerotic plaque in HIV patients with excess visceral adiposity.

1U01CA224348-01 (Jain) 09/30/2017–08/31/2020

NIH-NCI

Reprogramming PDAC Tumor Microenvironment to Improve Immunotherapy

The goal of this U01 is to provide novel mechanistic insights into reprogramming the immunosuppressive tumor microenvironment of PDAC into an immunostimulatory one. Our approach to achieve this will be to use widely prescribed and inexpensive inhibitors of the angiotensin II signaling.

1R01HL137913-02 (Tawakol) 07/15/2017–05/31/2021

NIH
Novel PET/CT and Treatment Strategies to reduce PTS following DVT
This clinical, molecular imaging, and biological research proposal seeks to: (1) establish the relationship between DVT and inflammation and risk of subsequent development of post – thrombotic syndrome and (2) develop novel anti-inflammatory therapies to reduce DVT complications.

R34 AR074114-01 (Leder) 09/01/2018-07/31/2020

NIH
Combination Osteoporosis Therapy and Fracture Reduction
The major goals are to support the planning of a clinical trial that will assess the capacity of a novel combination medication regimen to reduce fracture incidence in patients with severe osteoporosis. The successful completion of this clinical trial has the potential to fundamentally advance osteoporosis therapy, particular for those at the highest risk of fracture.

Completed Support

5R01MH101425-03 (Roffman) 08/01/2013–04/30/2018

NIH/NIMH
MRI studies of folate-related genes, diet, and development: Promise for psychosis
This study will examine neural effects of genetic variation throughout the folate metabolic pathway, in concert with dietary folate measures, in healthy adults and adolescents.

4P50CA165962-05 (Batchelor) 07/01/2013-06/30/2019

NIH-NCI
SPORE: Targeted Therapies for Glioma (Core B)
The Core provides shared resources of statistical and related expertise for long-term collaboration and short-term consultation with SPORE investigators in the research and developmental projects.

FRIEDM17A0 (Friedman) 05/01/2017-10/31/2018

Cystic Fibrosis Foundation Therapeutics, Inc.
Preventing depression and anxiety: Development and pilot of a CF-specific CBT intervention
This is a first phase of an 18-month development and small pilot study.

1R01CA221771-01A1 (Medarova) 08/01/2018-01/31/2019

NIH-NCI National Cancer Institute
Therapy for metastatic breast cancer based on micro RNA silencing
The major goals of this project are to employ nanodrugs capable of inhibiting the pro-metastatic miRNA-10b in ivo with the goal of regressing breast cancer metastatic to brain, lungs, bone, and liver and effecting a permanent cure.