## BIOGRAPHICAL SKETCH

| NAME | POSITION TITLE |
|---|---|
| **Kang, Huining, PhD** | **Associate Professor of Biostatistics**<br>**P30 Role: Statistician Biostatistics Core**<br>**Full Member Cancer Genetics, Epigenetics & Genomics** |
| eRA COMMONS USER NAME (credential, e.g., agency login)<br>HuKang | |

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

| INSTITUTION AND LOCATION | DEGREE *(if applicable)* | MM/YY | FIELD OF STUDY |
|---|---|---|---|
| Beijing Univ. of Posts & Telecom. Beijing, China | B. Sc. | 12/1981 | Mathematics |
| Beijing Univ. of Posts $ Telecom. Beijing, China | M. Sc. | 12/1984 | Applied Mathematics |
| University of New Mexico, Albuquerque, NM | M. Sc. | 05/2003 | Statistics |
| University of New Mexico, Albuquerque, NM | Ph. D. | 08/2006 | Statistics |

### A. Personal Statement

I am a biostatistician with 14 years of experience in cancer research. Currently I am a member of the Biostatistics Shared Resource and a member of the Cancer Genetics, Epigenetics and Genomics Program in the UNM Cancer Center (UNMCC). My primary roles within the Biostatistics Shared Resource are to collaborate on cancer related genomics studies, work on biomarker development studies and to enhance the research infrastructure within the UNMCC by interacting with the Analytical and Translational Genomics Shared Resource and Bioinformatics Shared Resource. My research interests include statistical modeling and data analysis of large genomic data sets (particularly gene expression arrays and more recently next generation sequencing data.) For the past ten years I have been one of the key analysts in the NCI Strategic Partnering to Evaluate Cancer Signatures (SPECS) Program and in one of the NCI Therapeutically Applicable Research to Generate Effective Treatments (TARGET) projects. I was among the first investigators in the U.S. to use statistical methods to develop risk classification algorithms and predictive models from gene expression array data for clinical intervention in children with acute lymphoblastic leukemia (ALL) to improve the overall outcomes (published in the high impact journal *Blood*, and commented by *Nature Review.*) Additionally, my statistical modeling approaches revealed a number of genes highly predictive of event-free survival, beyond the known risk factors, in a seminal study of infant ALL (one of the largest uniformly treated groups on infant leukemia to undergo microarray analysis). We are actively conducting further analyses of these expression profiles to identify novel therapeutic targets specific for the gene expression profiles. Recently my research interest has been extended to analysis of next-generation sequencing data. I am a key co-investigator in two NIH R01 grants, applying next-generation sequencing approaches to the analysis of gene expression and alternative RNA splicing in ALL and Adenoid Cystic Carcinoma. Since 2010 I have published 9 papers in the area of cancer related genomics studies as the leading author or co-author. I am also developing statistical methods for evaluating cancer biomarkers and biomedical tests and evaluating cancer biomarkers in several cancer research projects. I have developed some methods for estimating the accuracy of biomarkers under certain cost-effective study designs and I have helped many researchers in UNMCC evaluate cancer biomarker. I also provide statistical support to both the UNMCC Research Programs and the Clinical Components, including design of clinical studies involving biomarker development/evaluation or genomics. In summary, my work and experience in statistical modeling and analysis with complex epidemiologic data, biologic data, and genomic data and in particular, my solid record of achievement in cancer related genomic studies and cancer biomarker studies, makes me well qualified for my role within the Biostatistics Shared Resource.

**B. Positions and Honors**

**Positions and Employment**

1985 - 1986 Assistant Professor, Department of Basic Science, Beijing Forestry University, Beijing, China
1986 - 1992 Lecturer, Department of Basic Science, Beijing Forestry University, Beijing, China
1992 - 1993 Trainee, Kawasaki Steel System R & D Corp, Tokyo, Japan
1993 - 1997 Associate Professor, Department of Basic Science, Beijing Forestry University, Beijing, China
1997 - 2001 Professor, Department of Basic Science, Beijing Forestry University, Beijing, China
2001 - 2004 Research Assistant, Center of High Performance Computing, University of New Mexico
2004 - 2006 Senior Statistician, University of New Mexico, Albuquerque Cancer Center
2006 - 2007 Research Assistant Professor, Dept. of Internal Medicine, University of New Mexico
2007 - 2013 Assistant Professor, Dept. of Internal Medicine, University of New Mexico, Albuquerque, NM
2013 - Associate Professor, Dept. of Internal Medicine, University of New Mexico, Albuquerque, NM

**Other Experience and Professional Memberships**

1998 - 2001 Editorial board member, Journal of Beijing Forestry University. (This journal is one of the major natural scientific journals and is currently indexed by Ei Compendex.)
1998 - 2001 Expert of United Nations Convention to Combat Desertification
1996 - Member, Chinese Agricultural Applied Mathematics Association
2000 - 2004 Vice chief, Chinese Agricultural Applied Mathematics Association
2002-Present Member, Association of Chinese-American Engineers and Scientists, New Mexico Chapter
2003-Present Member, American Statistical Association.
2006 - 2009 Board member, Association of Chinese-American Engineers and Scientists, New Mexico Chapter
2007-Present Member, American Society of Hematology
2007-Present Member, American Association for Cancer Research

**Honors**

1992 Young Backbone Teacher of Beijing Higher Learning Institutions
1995 Outstanding Teacher Award of Beijing
1997 Outstanding Teacher Award of Baosteel Education Fund
2005 Passed the Ph.D. dissertation with distinction

**C. Selected Peer-reviewed Publications**


1. Bhojwani D, **Kang H**, Moskowitz NP, Min DJ, Lee H, Potter JW Davidson G, Willman CL, Borowitz MJ, Belitskaya-Levy I, Hunter SP, Raetz EA, Carroll WL. (2006) Biologic pathways associated with relapse in childhood acute lymphoblastic leukemia: a Children's Oncology Group Study. **Blood,** 108(2):711-7. PMCID: PMC1895482.
2. Bhojwani D, **Kang H**, Menezes RX, Yang W, Sather H, Moskowitz NP, Min DJ, Potter JW, Harvey R, Hunter SP, Seibel N, Raetz EA, Pieters R, Horstmann MA, Relling MV, den Boer ML, Willman CL Carrol WL; Children's Oncology Group Study; Dutch Childhood Oncology Group; German Cooperative Study Group for Childhood Acute Lymphoblastic Leukemia. (2008). Gene expression signatures predictive of early response and outcome in high-risk childhood acute lymphoblastic leukemia: A Childrens' Oncology Group Study. **J Clin Oncol**, 26(27):4376-84. PMCID: PMC2736991.
3. Stidley CA, Picchi MA, Leng S, Willink R, Crowell RE, Rlores KG, **Kang H**, Byers T, Gilliland FD, Belinsky SA. (2010). Multivitamins, folate, and green vegetables protect against gene promoter methylation in the aerodigestive tract of smokers. **Cancer Res**, 70(2):568-74. PMCID: PMC 3076796.
4. Garcia CF, Hunt KE, **Kang H**, Babb A, Gale JM, Vasef MA, Riechard KK. (2010) Most morphologic features in chronic lymphocytic leukemia/small lymphocytic lymphoma (CLL/SLL) do not reliably predict underlying FISH genetics or Immunoglobulin heavy chain variable region somatic mutational status. **Appl Immunohistochem Mol Morphol**, 2010 Mar; 18(2):119-27 PMID: 19826250.
5. **Kang H**, Chen IM, Wilson CS, Bedrick EJ, Harvey RC, Atlas SR, Devidas M, Mullighan CG, Wang X, Murphy M, Ar K, Wharton W, Borowitz MJ, Bhohwani D, Carroll WL, Camitta BM, Reaman GH, Smith MA, Downing JR, Hunger SP, Willman CL. (2010) Gene expression classifiers for relapse-free survival and

minimal residual disease improve risk classification and outcome prediction in pediatric B-precursor acute lymphoblastic leukemia. *Blood*, 2010 Feb. 115(7):1394-405. PMCID: PMC2826761. **Comment in Nat Rev Clin Oncol**. 2010 May;7(5):239.
6. Harvey RC, Mullighan CG, Chen IM, Wharton W, Mikhail FM, Carroll AJ, **Kang H**, Liu W, Dobbin KK, Smith MA, Carroll WL, Devidas M, Bowman WP, Camitta B, Reaman GH, Hunger SP, Downing JR and Willman CL. (2010) Rearrangement of CRLF2 is associated with mutation of JAK kinases, alteration of IKZF1, Hispanic/Latino ethnicity, and a poor outcome in pediatric B-progenitor acute lymphoblastic leukemia. **Blood**, 2010 Jul 1. 115(26):5312-21 PMCID: PMC2902132.
7. Erdei E, **Kang H**, Meisner A, White K, Pickett G, Baca C, Royce M, Berwick M. (2010) Polymorphisms in cytokine genes and serum cytokine levels among New Mexican Women with and without breast cancer. **Cytokine**. 2010 Jul;51(1):18-24 PMID: 20418110.
8. Harvey RC, Mullighan CG, Wang X, Dobbin KK, Davidson GS, Bedrick EJ, Chen IM, Atlas SR, **Kang H**, Ar K, Wilson CS, Wharton W, Murphy M, Devidas M, Carroll AJ, Borowitz MJ, Bowman WP, Downing JR, Relling M, Yang J, Bhojwani D, Carroll WL, Camitta B, Reaman GH, Smith M, Hunger SP, Willman CL. (2010) Identification of novel cluster groups in pediatric high-risk B-precursor acute lymphoblastic leukemia with gene expression profiling: correlation with genome-wide DNA copy number alterations, clinical characteristics, and outcome. Blood, 2010 Dec 2; 116(23):4874-84. PMCID: PMC3321747. **Comment in Blood**. 2010 Dec 2:116(23):4737-8.
9. Hill DA, Nibbe A, Royce ME, Wallace AM, **Kang H**, Wiggins CL, Rosenberg RD. (2010) Method of detection and breast cancer survival disparities in Hispanic women. **Cancer Epidemiol Biomarkers Prev**. 2010 Oct; 19(10):2453-60. PMCID: PMC3402167.
10. Reichard KK, **Kang H**, Robinett S. (2011) Pediatric B-lymphoblastic leukemia with RUNX1 amplification: clinicopathologic study of eight cases. **Mod Pathol**, 2011 Dec;24(12):1606-11.
11. **Kang H**, Wilson CS, Harvey RC, Chen IM, Murphy MH, Atlas SR, Bedrick EJ, Devidas M, Carroll AJ, Robinson BW, Stam RW, Valsecchi MG, Pieters R, Heerema NA, Hiden JM, Felix CA, Reaman GH, Camitta B, Winick N, Carroll WL, Dreyer ZE, Hunger SP, Willman CL. Gene expression profiles predictive of outcome and age in infant acute lymphoblastic leukemia: a Children's Oncology Group study. **Blood,** 2012 Feb. 119(8):1872-1881. PMCID: PMC3293641.
12. Chen I-M, Harvey RC, Mullighan CG, Gastier-Foster J, Wharton W, **Kang H**, Borowitz MJ, Camitta BM, Carroll AJ, Devidas M, Pullen DJ, Payne-Turner D, Tasian SK, Reshmi S, Cottrell CE, Reaman GH, Bowman WP, Carroll WL, Loh ML, Winick NJ Hunger SP and Willman CL. Outcome modeling with *CRLF2*, *IKZF1*, *JAK* and minimal residual disease in pediatric acute lymphoblastic leukemia: a Children's Oncology Group Study. **Blood,** 2012 Apr 12:119(15):3512-22. PMCID: PMC3325039.
13. Loh ML, Zhang J, Harvey RC, Roberts K, Payne-Turner D, **Kang H**, Wu G, Chen X, Becksfort J, Edmonson M, Buetow KH, Carroll WL, Chen IM, Wood B, Borowitz MJ, Devidas M, Gerhard DS, Bowman P, Larsen E, Winick N, Raetz E, Smith M, Downing JR, Willman CL, Mullighan CG, and Hunger SP. Tyrosine kinome sequencing of pediatric acute lymphoblastic leukemia: a report from the Children's Oncology Group TARGET Project. **Blood**. 2013 Jan 17; 121(3):485-8. PMCID: PMC3548168.
14. Swaminathan S, Huang C, Geng H, Chen Z, Harvey R, **Kang H**, Ng C, Titz B, Hurtz C, Sadiyah MF, Nowak D, Thoennissen GB, Rand V, Graeber TG, Koeffler HP, Carroll WL, Willman CL, Hall AG, Igarashi K, Melnick A, Müschen M. Bach2 mediates negative selection and p53-dependent tumor suppression at the pre-B cell receptor checkpoint. **Nat Med**. 2013 Aug; 19(8):1014-22. PMCID: PMC3954721. Comment in Cancer Cell. 2013 Sep; 24(3):282-4.
15. Davies S, Holmes A, Lomo L, Steinkamp MP, **Kang H**, Muller CY, Wilson BS. High incidence of ErB3, ErbB4, and MET expression in ovarian Cancer. **Int J Gynecol Pathol**. 2014 Jul; 33(4):402-10. PMCID: PMC Journal – In Process.

**D. Ongoing Research Support**

R01DE023222 (Ness PI) 09/10/12 – 08/31/16
*Mutations and Target Genes in Adenoid Cystic Carcinoma*

This project will focus on the identification of genes that are regulated by Myb-NFIB fusion proteins expressed in Adenoid Cystic Carcionmas, and a determination of whether the fusion proteins have different and unique activities than wild type Myb proteins expressed in normal cells.
Role: Co-Investigator

R01CA170250 (Ness PI) 8/08/12 – 05/31/16
Alternative RNA splicing and protein products in leukemia outcome (PQ11)
This NCI Provocative Questions Grant will use next-generation sequencing and sophisticated bioinformatics approaches to analyze the alternative RNA splicing in a large cohort of pediatric leukemia patient samples, to determine whether the enhanced levels of RNA splicing observed in leukemias is due to splicing noise or contributes to the disease process.
Role: Co-investigator

R01CA132877 (Hill PI) 10/01/09 – 09/30/14
Funding: NIH/NCI
*Towards a Transdisciplinary Understanding of Breast Cancer Survival Disparities*
The major goal of this study is to comprehensively investigate factors related to the disproportionate breast cancer mortality in Hispanic as compared to non-Hispanic White women in New Mexico, and to determine the contribution of each to the disparate survival.
Role: Co-Investigator

P50CA14813 (Thompson PI) 04/01/10 – 03/31/15
Funding: NIH/NCI
*Understanding and Preventing Breast Cancer Disparities in Latinas: Project 4*
The major goal of this project is to relate tumor characteristics of Hispanic women to both ancestry (using ancestry informative markers) and risk factors (ascertained through Project #3 of this research program) to better understand the character of tumors that affect Hispanic women that could explain, at least in part, their poorer survival relative to non-Hispanic women.
Role: Co-Investigator

U01CA157937 (Willman PI) 04/01/11 – 07/31/16
Funding: NIH/NCI
*Molecular Signature for Outcome Prediction in Therapeutic Targeting in ALL*
The major goal of this project is to improve risk classification, outcome prediction and therapeutic response in pediatric and adult ALL.
Role: Co-Investigator

P30CA118100 (Willman PI) 09/01/10 – 08/31/15
Funding: NCI
*UNM Cancer Center Support Grant*
This project provides infrastructure support for the University of New Mexico Cancer Center, including a facility core in biostatistics.
Role: Co-Investigator

**Completed Research Support**

5 U01 CA114762-05 (Willman PI) 04/01/05 – 12/31/10
Funding: NIH/NCI
*Strategic Partnerships to Evaluate Cancer Signatures: Leukemia Signatures for Risk Classification and Targeting.*

7388-07 (Willman PI) 10/01/05 – 09/30/11
Funding: Leukemia and Lymphoma Society
*LLS Specialized Center of Research (SCOR) in Leukemia: Comprehensive Molecular Technologies for Improved Risk Classification and Therapy*