

Principal Investigator

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Employment History

Present Senior Research Scientist, Genome Institute of Singapore, Singapore.
Present Adjunct Associate Professor, Centre for Molecular Epidemiology, National University of Singapore, Singapore
2000-2002 Research Scientist and Head, Genotyping Laboratory, Columbia Genome Center, Columbia University New York, NY, USA
1998-2000 Research Scientist in Molecular Genetics, New York State Psychiatric Institute, New York, NY, USA
1997-2000 Postdoctoral Research Fellow, Columbia Genome Center and Department of Psychiatry, College Physicians and Surgeons at Columbia University, New York, NY, USA
1989-1991 Research Assistant, Institute of Oceanology, Chinese Academy of Science, Qingdao, China

Research Interests

A great challenge to human geneticists is to understand the genetic basis of common diseases. The difficulty in genetically dissecting human common disorders is mainly due to its pathogenic complexity, a likely reflection of the interplay among multiple genetic and environmental risk factors each with moderate effect. By employing a variety of genetic approaches, my lab is working on identifying genetic variants that contribute to individual's predisposition to or protection against common disorders and further understanding their interaction with environmental risk factors. The scope of my current research mainly covers the genetic study of breast cancer and the neurological/psychiatric disorders such as Parkinson disease, stroke and schizophrenia, but also extends to the genetic study of inter-individual variation at cellular level using in-vitro model system. A common theme of our human disease studies is to pursue a comprehensive analysis of candidate genes by focusing on cassettes of biologically relevant genetic pathways, instead of individual candidate gene.

Genetic epidemiology of sporadic breast cancer: Breast cancer is a leading health problem of woman, striking over one million women globally each year. Besides well-characterized environmental and lifestyle risk factors, family and twin studies have clearly indicated an important role of genetic risk factors in both familial and sporadic breast cancer. However, despite the identification of a few high-penetrance risk genes in familial breast cancers, genetic risk factors for the vast majority of sporadic cases are largely unknown. By collaborating with an epidemiology group at the Karolinska Institute of Sweden, we intend to identify genetic risk factors for sporadic breast cancer by performing a comprehensive association analysis of hormone-related candidate genes in a large and well-characterized Swedish cohort consisting of over 3000 subjects. Our candidate gene selection targets at the pathways that modulate either individual's exposure to hormone or individual's cellular response to such exposure. Availability

of the detailed environmental and lifestyle risk factor information for each subject provides a unique opportunity for us to explore the gene-environment interaction in understanding sexual hormone-related risk for breast cancer. Up to today, this study is one of the most comprehensive, powerful and cost effective candidate gene-based association studies for breast cancer.

Molecular genetic study of neurological and psychiatric disorders in Singapore population:

Neurological and neuropsychiatric disorders are a major health concern in Singapore and worldwide. For example, a recent population indicated that the prevalence of Parkinson disease in Singapore is around 3 in 1000. Given that the Singapore population is becoming older, the prevalence of this disorder is expected to increase further. By collaborating with the clinicians and neurologists from the Singapore General Hospital as well as other Asian countries, our study of neurological diseases such as Parkinson disease and stroke focuses primarily on Chinese population. We believe that our study provide an opportunity for investigating inter-ethnic difference in genetic predisposing to neurological diseases between Western and Chinese populations. Our research effort in this area also covers the genetic study of the neuropsychiatric diseases such as schizophrenia and the side effect of antipsychotic treatments through collaboration with the clinicians from the Institute of Mental Health of Singapore.

Genetic dissection of inter-individual variation at cellular level using lymphoblastoid cell lines:

In addition to the genetic study of human diseases, we extend our genetic research paradigm to understanding the genetic basis of inter-individual difference at the cellular level. Complex disease phenotypes are often the ultimate manifestations of multiple underlying physiological changes involving a large number of molecular and genetic alterations. In contrast, cellular phenotypes, such as response to cytotoxicity stress, conceivably involve fewer molecular and genetic alterations and are thus easier to detect by genetic analysis. Lymphoblastoid cell lines have long been used for characterizing inter-individual genetic variations. Now, we extend the usage of this in-vitro system to study the genetic basis of inter-individual variation in various cellular response phenotypes. An essential feature of this study is to combine the power of conventional genetic approaches with the reliability and accuracy of cellular phenotyping in dissecting the genetic basis of inter-individual variation at the cellular level.

Academic Qualifications

- 1991-1997 Ph.D., Quantitative Genetics, Duke University, Durham, NC, USA.
- 1986-1989 M.S., Marine Biology, Institute of Oceanology, Chinese Academy of Sciences, Qingdao, Shandong, PR China
- 1981-1986 B.S., Biology, University of Science & Technology of China, Hefei, Anhui, China

Selected Publications

1. Chen, W Huang, J Gui, S Yang, F Zhou, Q Xiong, H Wu, Y Cui, M Gao, W Li, J Li, K Yan, W Yuan, S Xu, Liu Jianjun, X Zhang, (2005) "A Novel Linkage to Generalized Vitiligo On 4q13-q21 Identified in a Genome-wide Linkage Analysis of Chinese Families" . Am J Hum Genet. 76(6). 1057 - 65

2. Park N, Cheng R, Juo SH, Liu Jianjun, Loth JE, Endicott J, Gilliam TC, Baron M, (2005) "Absence of psychosis may influence linkage results for bipolar disorder" . *Mol Psychiatry*. 10(3) . 235-7
3. Liu Jianjun, SL Lim, Ruan Yijun, Ling AE, Ng LF, C Drostein, Liu Edison Tak-Bun, Stanton Lawrence W, Hibberd Martin Lloyd, (2005) "SARS Transmission Pattern in Singapore Reassessed by Viral Sequence Variation Analysis" . *PLoS Med*. 2(2) . 162-168
4. Vinsensius, B Vega S, Ruan Yijun, Liu Jianjun, Lee W.H., Wei Chia Lin, Su Yun S.T., Tang K.F., Zhang Tao, Lin S., Kolatkar, Prasanna R, Eong O.E., Ling A.E., Stanton, Lawrence W, Long P.M., Liu Tak Bun, Edison, (2004) "Mutational dynamics of the SARS corona virus in cell culture and human population." . *BMC Infectious Diseases* 4(1):32-40
5. Park N, Juo SH, Cheng R, Liu Jianjun, Loth JE, Lilliston B, Nee J, Grunn A, Kanyas K, Lerer B, Endicott J, Gilliam TC, Baron M, (2004) "Linkage analysis of psychosis in bipolar pedigrees suggests novel putative loci for bipolar disorder and shared susceptibility with schizophrenia" . *Mol Psychiatry*. 9(12) . 1091-9
6. Liu Jianjun, S-H Juo, A Dewan, A Grunn, X Tong, M Brito, JE Loth, K kanyas, B Lerer, J Endicott, G Penchaszadeh, J Knowles, J Ott, TC Gilliam, M Baron, (2003) "Evidence for a putative bipolar disorder locus on 2p13-16 and other potential loci on 4q31, 7q34, 8q13, 10q21-24, 13q32, 14q21 and 17q11-12" . *Molecular Psychiatr*. 8 . 333-342
7. A. L. Yonan, M. Alarc?n, R, R. Cheng, P. K. E. Magnusson, S. J. Spence, A. A. Palmer, A. Grunn, S-H Juo, J. D. Terwilliger, Liu Jianjun, R. M. Cantor, D. H. Geschwind, T. C. Gilliam, (2003) "A Genomewide Screen of 345 Families for Autism Susceptibility Loci" . *Am J Hum Genet*. 73 . 886-897
8. Liu Jianjun, S-H Juo, A. Dewan, A. Grunn, X. Tong, M. Brito, N. Park, JE Loth, K Kanyas, B Lerer, J Endicott, G Penchaszadeh, J A. Knowles, J Ott, T. C Gilliam, M Baron, (2003) "Evidence for a putative bipolar disorder locus on 2p13-16 and other potential loci on 4q31, 7q34, 8q13, 10q21-24, 13q32, 14q21 and 17q11-12" . *Molecular Psychiatry*. 8 . 333-342
9. M. Winawer, FM Boneschi, C Barker-Cummings, JH Lee, Liu Jianjun, C Mekios, TC Gilliam, TA Pedley, WA Hauser, R Ottman, (2002) "Four new families with autosomal dominant partial epilepsy with auditory features: clinical description and linkage to chromosome 10q24" . *Epilepsia*. 43 . 60-67
10. M. Alarcon, R. Cantor, Liu Jianjun, TC Gilliam, the AGRE Consortium, D Geschwind, (2002) "Evidence for a Language QTL on chromosome 7q35-36 in multiplex autism families" . *Am J Hum Genet*. 70 . 60-71

11. A. Martinez-Mir, Liu Jianjun, D Gordon, MS Weiner, J Fine, J Ott, TC Gilliam, AM Christiano, (2002) "EB simplex superficialis resulting from a mutation in the type VII collagen gene" . *J Invest Dermatol.* 118 . 547-549
12. Liu Jianjun, S-H Juo, P Holopainen, X Tong, A Grunn, M Brito, K Mustalahti, M Maki, TC Gilliam, J Partanen, (2002) "A genome-wide mapping on Celiac disease in Finnish families" . *Am. J. Hum. Genet.* 70 . 51-59
13. Liu Jianjun, S-H Juo, J Terwilliger, A Grunn, X Tong, M Brito, J Loth, K Kanyas, B Lerer, J Endicott, G Penchaszadeh, TC Gilliam, M Baron, (2001) "A Follow-Up Linkage Study Supports Evidence for a Bipolar Affective Disorder Locus on Chromosome 21q22" . *Am. J. Med. Genet.* . 105 . 189-94
14. Liu Jianjun, D. Nyholt, P Magnussen, E Parano, P Pavone, D Geschwind, C Lord, P Iversen, J Hoh, the AGRE Consortium, J Ott, TC Gilliam, (2001) "A Genome-wide Screen for Autism Susceptibility Loci" . *Am. J. Hum. Genet.* 69 . 327-340 . (Liu and Nyholt contributed equally to this paper)
15. Aita, V, Liu Jianjun, J Knowles, J Terwilliger, R Baltazar, A Grunn, O Yun, J Loth, J Alexander, B Lerer, J Endicott, Z Wang, G Penchaszadeh, TC Gilliam, M Baron, (1999) "A comprehensive linkage analysis of chromosome 21q22 supports prior evidence for a putative bipolar affective disorder locus" . *Am. J. Hum. Genet.* 64 . 210-217 . (Aita and Liu contributed equally to the paper)
16. Gecz J, Barnett S, Liu Jianjun, G Hollway, A Donnelly, H Eyre, HS Eshkevari, R Baltazar, A Grunn, Nagaraja, TC Gilliam, L Peltonen, GR Sutherland, M Baron, JC Mulley, (1999) "Characterization of the human glutamate receptor subunit 3 gene (GRIA3), a candidate for bipolar disorder and nonspecific X-linked mental retardation" . *Genomics* . 62 . 356-68
17. Zeng, Z, Liu Jianjun, L. Stam, J. Mercer, C. Kao, and C. Laurie, (1999) "Genetic architecture of a morphological shape difference between two *Drosophila* species" . *Genetics.* 154 . 299-310 . (Zeng, Z and Liu Jianjun equally contributed)
18. True, J, Liu Jianjun, L Stam, Z Zeng, C Laurie, (1997) "Quantitative genetic analysis of divergence in male secondary sexual traits between *Drosophila simulans* and *D. mauritiana*" . *Evolution.* 51 . 816-832
19. Laurie, C, J True, Liu Jianjun, J Mercer, (1997) "An introgression analysis of quantitative trait loci that contribute to a morphological difference between *Drosophila simulans* and *D. mauritiana*" . *Genetics.* 145 . 339 - 348
20. Liu Jianjun, J Mercer, L Stam, G Gibson, Z Zeng, C Laurie, (1996) "Genetic analysis of a morphological shape difference in the male genitalia of *Drosophila simulans* and *D. mauritiana*" . *Genetics.* 142 . 1129-1145

21. Liu Jianjun, (1993) "Accumulation of an antifouling toxin, tributyltin, in *Argopecten irradians* (Bivalvia: Pectinidae)". *The Marine Biology of the South China. Proceedings of the First International Conference on the Marine Biology of Hong Kong and the South China Sea, Hong Kong, 28 October - 3 November 1990.* Hong Kong University Press, Hong Kong

Honors And Awards

- 2000-2001 Young Investigator Award, Cure Autism Now Foundation
1999-2000 Young Investigator Award, National Alliance For Research On Schizophrenia and Depression
1998-2000 Training Grant, New York State Psychiatric Institute
1990 Fellowship, Duke University

Committee and Advisory Board

- 2003-present Member, Peripheral, Central, Sensory & Cellular Nervous System/Mental Health Subcommittee, National Medical Research Council, Singapore
2004-present Member, Domain-Specific Review Board C, National Health Group, Singapore