

# Charleston W.K. Chiang

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Curriculum Vitae

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## Academic Appointment

- 2019-present    Assistant Professor, University of Southern California  
                    Department of Quantitative and Computational Biology  
                    Dornsife College of Letters, Arts, and Sciences
- 2018-present    Assistant Professor, University of Southern California  
                    Center for Genetic Epidemiology, Department of Population and Public Health Sciences  
                    Keck School of Medicine

## Education

# parental leaves in 2013 and 2016.

- 2017#            Postdoctoral Research Fellow, UCLA  
                    Center for Neurobehavioral Genetics, Semel Institute (Advisor: Nelson B. Freimer, M.D.)
- 2015#            Ruth L. Kirschstein NRSA Postdoctoral Research Fellow, UCLA  
                    Department of Ecology and Evolutionary Biology (Advisor: John Novembre, Ph.D.)
- 2011            Ph.D., Genetics, Harvard University  
                    Division of Medical Sciences, Program in Biological and Biomedical Science  
                    Leder Human Biology and Translational Medicine Program Scholar  
                    Department of Genetics (Advisor: Joel N. Hirschhorn, M.D. Ph.D.)
- 2005            B.S., Microbiology, Immunology, and Molecular Genetics, UCLA  
                    Mathematics (minor), Statistics (minor)  
                    Summa Cum Laude, College Honors Program Scholar

## Publications

**12** (co-) first authorship (numerically **bolded**), **10** (co-) corresponding authorship (numerically **bolded**)

\* equal contribution, † corresponding author, **bolded** name denotes group member

Through 2020, 19 out of 35 publications were in journals with impact factor (IF) > 8 at the year of publication.

### Preprints and in preparation

48. Darst BF, Hughley R, et al. "Germline *HOXB13* variant contributes to risk of prostate cancer in men of African ancestry." *In preparation*
47. **Fan C<sup>†</sup>**, Mancuso N\*, **Chiang CWK<sup>\*†</sup>**. "A genealogical estimate of genetic relationships." **bioRxiv** (2021): [biorxiv/2021/456747](https://doi.org/10.1101/2021.05.27.445973v1)
46. Qin X, **Chiang CWK**, Gaggiotti OE. "Deciphering signatures of natural selection via deep learning." **bioRxiv** (2021): <https://www.biorxiv.org/content/10.1101/2021.05.27.445973v1>
45. Fernandez-Rhodes L, Graff M, et al. "Ancestral diversity improves discovery and fine-mapping of genetic loci for anthropometric traits – the Hispanic/Latino Anthropometry Consortium." **bioRxiv** (2021): <https://www.biorxiv.org/content/10.1101/2021.05.27.445969v1>
44. **Jeon S**, de Smith AJ, Li S, **Chen M**, Muskens IS, Morimoto LM, Dewan AT, Mancuso N, Metayer C, Ma X, Wiemels JL<sup>†</sup>, **Chiang CWK<sup>†</sup>**. "Genome-wide trans-ethnic meta-analysis identifies novel susceptibility loci for childhood acute lymphoblastic leukemia." **medRxiv** (2021): <https://www.medrxiv.org/content/10.1101/2021.05.07.21256849v1.full>

43. Qin X, **Chiang CWK**, Gaggiotti OE. "Kernel Local Fisher Discriminant Analysis of Principal Components (KLFDA) significantly improves the accuracy of predicting geographic origin of individuals." *bioRxiv* (2021): <https://www.biorxiv.org/content/10.1101/2021.05.15.444294v2>

Peer-Reviewed and Published

42. Kachuri L, **Jeon S**, DeWan AT, Metayer C, Ma X, Witte JS, **Chiang CWK**, Wiemels JL, de Smith AJ. "Genetic determinants of blood cell traits influence susceptibility to childhood acute lymphoblastic leukemia." *Accepted in Am J Hum Genet* (2021). *medRxiv* (2021): <https://doi.org/10.1101/2021.04.17.21255679>
41. **Chiang CWK**<sup>†</sup>. "The opportunities and challenges of integrating population histories into genetic studies of diverse populations: a motivating example from Native Hawaiians." *Accepted in Frontiers in Genetics* (2021). *arXiv* (2020): <https://arxiv.org/abs/2012.12532>
40. **Chen M**<sup>†</sup>, **Chiang CWK**<sup>†</sup>. "Allele frequency differentiation at height-associated SNPs among continental human populations." *Eur J Hum Genet*. 2021 Jul 15. doi: 10.1038/s41431-021-00938-2.
39. Ganel L, Chen L, Christ R, Vangipurapu J, Young E, Das I, Kanchi K, Larson D, Regier A, Abel H, Kang CJ, Scott A, Havulinna A, **Chiang CWK**, Service S, Freimer N, Palotie A, Ripatti S, Kuusisto J, Boehnke M, Laakso M, Locke A, Stitzel NO, Hall IM. "Mitochondrial genome copy number measured by DNA sequencing in human blood is strongly associated with metabolic traits via cell-type composition differences." *Hum Genomics*. 2021 Jun 7;15(1):34. doi: 10.1186/s40246-021-00335-2.
38. Chen L, Abel HJ, Das I, Larson DE, Ganel L, Kanchi KL, Regier AA, Young EP, Kang CJ, Scott AJ, Chiang C, Wang X, Lu S, Christ R, Service SK, **Chiang CWK**, Havulinna AS, Kuusisto J, Boehnke M, Laakso M, Palotie A, Ripatti S, Freimer NB, Locke AE, Stitzel NO, Hall IM. "Association of structural variation with cardiometabolic traits in Finns." *Am J Hum Genet*. 2021 Apr 1;108(4):583-596. doi: 10.1016/j.ajhg.2021.03.008.
37. Graff M, et al. "Discovery and fine-mapping of height loci via high-density imputation of GWASs in individuals of African ancestry." *Am J Hum Genet*. 2021 Apr 1;108(4):564-582. doi: 10.1016/j.ajhg.2021.02.011.
36. **Sun H**<sup>\*</sup>, **Lin M**<sup>\*</sup>, Russell EM, Minster RL, **Chan TF**, **Dinh BL**, Naseri T, Reupena MS, Lum-Jones A, OLaGA Study Group, Cheng I, Wilkens LR, Le Marchand L, Haiman CA, **Chiang CWK**<sup>†</sup>. "The impact of global and local Polynesian genetic ancestry on complex traits in Native Hawaiians." *PLoS Genet*. 2021 Feb 11; doi: 10.1371/journal.pgen.1009273.
35. Iksan OA, Kisselev IA, Garshin AA, Skvortsova LA, Zhaniyazov ZA, Alpysbes MA, **Chiang CWK**, Musralina LZ, Zhunussova GS, Khussainova EM. "Analysis of the Kazakh tribe Baiuly based on the distribution of the Y-chromosome haplogroups." *Int J Biol Chem*. 2021 Jan; 13(2):80-87. doi: 10.26577/ijbch.2020.v13.i2.10.
34. Pua CJ, et al. "Genetic Studies of Hypertrophic Cardiomyopathy in Singaporeans Identify Variants in TNNI3 and TNNT2 that Are Common in Chinese Patients." *Cir Genom Precis Med*. 2020 Oct;13(5):424-434. doi: 10.1161/CIRCGEN.119.002823.
33. Chen MH, Raffield LM, Mousas A, et al. "Trans-ethnic and Ancestry-Specific Blood-Cell Genetics in 746,667 individuals from 5 Global Populations." *Cell*. 2020 Sep 3;182(5):1198-1213.e14. doi:10.1016/j.cell.2020.06.045.
32. **Lin M**, Caberto C, Wan P, Li Y, Lum-Jones A, Tiirikainen M, Pooler L, Nakamura B, Sheng X, Porcel

J, Lim U, Setiawan VW, Le Marchand L, Wilkens LR, Haiman CA, Cheng I, **Chiang CWK<sup>†</sup>**. "Population-specific reference panels are crucial for the genetic analyses: an example of the *CREBRF* locus in Native Hawaiians." **Hum Mol Genet.** 2020 Aug 3;29(13):2275-2284. doi: 10.1093/hmg/ddaa083.

31. **Chen M<sup>†</sup>**, Sidore C, Akiyama M, Ishigaki K, Kamatani Y, Schlessinger D, Cucca F, Okada Y, **Chiang CWK<sup>†</sup>**. "Evidence of Polygenic Adaptation in Sardinia at Height-Associated Loci Ascertained from the Biobank Japan." **Am J Hum Genet.** 2020 Jul 2;107(1):60-71. doi: 10.1016/j.ajhg.2020.05.014.
30. Marcus JH, Posth C, Ringbauer H, Lai L, Skeates R, Sidore C, Beckett J, Furtwangler A, Olivieri A, **Chiang CWK**, Al-asadi H, Dey K, Joseph TA, Liu CC, Der Sarkissian C, Radzeviciute R, Michel M, Gradoli MG, Marongiu P, Rubino S, Mazzarello V, Rovina D, La Fragola A, Serra RM, Bandiera P, Bianucci R, Pompianu E, Murgia C, Guirguis M, Orquin RP, Tuross N, van Dommelen P, Haak W, Reich D, Schlessinger D, Cucca F, Krause J, Novembre J. "Genetic history from the Middle Neolithic to present on the Mediterranean island of Sardinia." **Nat Comm.** 2020 Feb 24;11(1):939. doi: 10.1038/s41467-020-14523-6.
29. de Smith AJ, Walsh KM, Morimoto LM, Francis SS, Hansen HM, **Jeon S**, Gonseth S, **Chen M**, **Sun H**, Luna-Fineman S, Antillón F, Girón V, Kang AY, Smirnov I, Shao X, Whitehead TP, Barcellos LF, Jolly KW, Healy J, Laverdière C, Sinnett D, Taub JW, Birch JM, Thompson PD, Pombo-de-Oliveira MS, Spector LG, DeWan AT, Mueller BA, **Chiang CWK**, Metayer C, Ma X, Wiemels JL. "Heritable variation at the chromosome 21 gene *ERG* is associated with acute lymphoblastic leukemia risk in children with and without Down syndrome." **Leukemia.** 2019 Nov;33(11):2746-2751. doi: 10.1038/s41375-019-0514-9.
28. Locke AE\*, Steinberg KM\*, **Chiang CWK\***, Service S\*, Havulinna A, Stell L, Pirinen M, Abel HJ, Chiang CC, Fulton RS, Jackson AU, Kang CJ, Kanchi KL, Koboldt DC, Larson DE, Nelson J, Nicholas TJ, Pietila A, Ramensky V, Ray D, Scott LJ, Stringham HM, Vangipurapu J, Welch R, Yajnik P, Yin X, Eriksson JG, Ala-Korpela M, Jarvelin MR, Manniko M, Laivouri H, FinnGen Project, Dutcher SK, Stitzel NO, Wilson RK, Hall IM, Sabatti C, Palotie A, Salomaa V, Laakso M, Ripatti S, Boehnke M, Freimer NB. "Exome sequencing of Finnish isolates enhances rare-variant association power." **Nature.** 2019 Aug;572(7769):323-328. doi: 10.1038/s41586-019-1457-z.
27. Sohail M, Maier RM, Ganna A, Bloemendal A, Martin AR, Turchin MC, **Chiang CWK**, Hirschhorn JN, Daly MJ, Patterson N, Neale B, Mathieson I, Reich D, Sunyaev SR. "Polygenic adaptation on height is overestimated due to uncorrected stratification in genome-wide association studies." **eLife.** 2019 Mar 21;8. pii: e39702. doi: 10.7554/eLife.39702.
26. **Chiang CWK<sup>†</sup>**, Mangul S, Robles C, Sankararaman S. "A comprehensive map of genetic variation in the world's largest ethnic group – Han Chinese." **Mol Bio Evol.** 2018 Nov 1;35(11):2736-2750. doi: 10.1093/molbev/msy170.
25. **Chiang CWK<sup>†</sup>**, Marcus J, Sidore C, Biddanda A, Al-asadi H, Zoledziwska M, Pitzalis M, Busonero F, Maschio A, Pistis G, Steri M, Angius A, Lohmueller KE, Abecasis G, Schlessinger D, Cucca F, Novembre J<sup>†</sup>. "Genomic history of the Sardinian population." **Nat Genet.** 2018 Oct;50(10):1426-1434. doi: 10.1038/s41588-018-0215-8.
24. Ganna A, et al. "Quantifying the impact of rare and ultra-rare coding variation across the phenotypic spectrum." **Am J Hum Genet.** 2018 Jun 7;102(6):1204-1211. doi: 10.1016/j.ajhg.2018.05.002.
23. Kim DS, et al. "Novel association of TM6SF2 rs58542926 genotype with increased serum tyrosine levels and decreased apoB-100 particles in Finns." **J Lipid Res.** 2017 Jul;58(7):1471-1481. doi: 10.1194/jlr.P076034.

22. Ganel L, et al. "SVScore: an impact prediction tool for structural variation." **Bioinformatics**. 2017 Apr 1;33(7):1083-1085. doi: 10.1093/bioinformatics/btw789.
21. Reid JS, Jeff J, et al. "A principal component meta-analysis on multiple anthropometric traits identifies novel loci for body shape in >170,000 individuals of the GIANT Consortium." **Nat Commun**. 2016 Nov 23;7:13357. doi: 10.1038/ncomms13357.
20. Chen CH, Yang JH, **Chiang CWK**, Hsiung CN, Wu PE, Chang LC, Chang J, Song IW, Yang SL, Chen YT, Liu FT, Shen CY. "Population structure of Han Chinese in the modern Taiwanese population based on 10,000 participants in the Taiwan Biobank project." **Hum Mol Genet**. 2016 Dec 15;25(24):5321-5331. doi: 10.1093/hmg/ddw346.
19. **Chiang CWK**<sup>†</sup>, Ralph P, Novembre J<sup>†</sup>. "Conflations of short identity-by-descent segments bias their inferred length distribution." **G3: Genes, Genomes, Genetics**. 2016 May 1; 6(5):1287-1296. doi: 10.1534/g3.116.027581.
18. Winkler TW, Justic AE, Graff M, Barata L, et al. "The influence of age and sex on genetic associations with body composition: a large-scale genome-wide interaction study." **PLoS Genet**. 2015 Oct 1;11(10):e1005378. doi: 10.1371/journal.pgen.1005378. eCollection 2015 Oct.
17. Zoledziwska M\*, Sidore C\*, **Chiang CWK**\*, Sanna S\*, Mulas A, Steri M, Busonero F, Marcus JH, Marongiu M, Maschio A, Del Vecchio DO, Floris M, Meloni A, Delitala A, Concas MP, Murgia F, Biino G, Vaccargiu S, Nagaraja R, Lohmueller KE; UK10K Consortium, Timpson NJ, Soranzo N, Tachmazidou I, Dedoussis G, Zeggini E; Understanding Society Scientific Group, Uzzau S, Jones C, Lyons R, Angius A, Abecasis GR, Novembre J, Schlessinger D, Cucca F. "Height-reducing variants and selection for short stature in Sardinia." **Nat Genet**. 2015 Nov;47(11):1272-81. doi: 10.1038/ng.3368.
16. Sidore C, Busonero F, Maschio A, Porcu E, Naitza S, Zoledziwska M, Mulas A, Pistis G, Steri M, Danjou F, Kwong A, Ortega Del Vecchio VD, **Chiang CWK**, Bragg-Gresham J, Pitzalis M, Nagaraja R, Tarrier B, Brennan C, Uzzau S, Fuchsberger C, Atzeni R, Reinier F, Berutti R, Huang J, Timpson NJ, Toniolo D, Gasparini P, Malerba G, Dedoussis G, Zeggini E, Soranzo N, Jones C, Lyons R, Angius A, Kang HM, Novembre J, Sanna S, Schlessinger D, Cucca F, Abecasis GR. "Genome sequencing elucidates Sardinian genetic architecture and augments association analyses for lipid and blood inflammatory markers." **Nat Genet**. 2015 Nov;47(11):1352-6. doi: 10.1038/ng.3403.
15. Yang WY, Platt A, **Chiang CWK**, Eskin E, Novembre J, Pasaniuc B. "Spatial localization of recent ancestors for admixed individuals." **G3: Genes, Genomes, Genetics**. 2014 Nov 3; 4(12):2505-18. doi: 10.1534/g3.114.014274.
14. Wang SR, Agarwala V, Flannick J, **Chiang CWK**, Altshuler D, GoT2D Consortium, Hirschhorn JN. "Simulation of Finnish population history, guided by empirical genetic data, to assess power of rare variant tests in Finland." **Am J Hum Genet**. 2014 May 1;94(5):710-20. doi: 10.1016/j.ajhg.2014.03.019.
13. Olalde I, Sanchez-Quinto F, Datta D, Marigorta UM, **Chiang CWK**, Rodriguez JA, Fernandez-Callejo M, Gonzalez I, Montfort M, Matas-Lalueza L, Civit S, Luiselli D, Charlier P, Pettener D, Ramirez O, Navarro A, Himmelbauer H, Marques-Bonet T, Lalueza-Fox C. "Genomic analysis of the blood attributed to Louis XVI (1754-1793), king of France." **Sci Rep**. 2014 Apr 24;4:4666. doi: 10.1038/srep04666.
12. Olalde I, Allentoft ME, Sanchez-Quinto F, Santpere G, **Chiang CWK**, DeGiorgio M, Prado-Martinez J, Rodriguez JA, Quilez J, Rasmussen S, Ramirez O, Marigorta UM, Fernandez-Callejo M, Prada ME, Encinas JM, Nielsen R, Netea MG, Novembre J, Sturm RA, Sabeti P, Marques-Bonet T,

- Navarro A, Willerslev E, Lalueza-Fox C. "Derived immune and ancestral pigmentation alleles in a 7,000-year-old Mesolithic European." **Nature**. 2014 Mar 13;507(7491):225-8. doi: 10.1038/nature12960.
11. Monda KL, Chen GK, Taylor KC, Palmer CD, et al. "A meta-analysis identifies new loci associated with body mass index in individuals of African ancestry." **Nat Genet**. 2013 Jun;45(6):690-6. doi: 10.1038/ng.2608.
  10. Turchin MC\*, **Chiang CWK\***, Palmer CD, Sankararaman S, Reich D, Genetic Investigation of Anthropometric Traits (GIANT) Consortium, Hirschhorn JN. "Evidence of widespread selection on standing variation in Europe at height-associated SNPs." **Nat Genet**. 2012 Sep;44(9):1015-9. doi: 10.1038/ng.2368.
  9. **Chiang CWK**, Liu CT, Lettre G, Lange LA, Jorgensen NW, Keating BJ, Vedantam S, Nock NL, Franceschini N, Reiner AP, Demerath EW, Boerwinkle E, Rotter JI, Wilson JG, North KE, Papanicolaou GJ, Cupples LA, Genetic Investigation of Anthropometric Traits (GIANT) consortium, Murabito JM, Hirschhorn JN. "Ultraconserved elements in the human genome: association and transmission analyses of highly constrained single-nucleotide polymorphisms." **Genetics**. 2012 Sep;192(1):253-66.
  8. Dauber A, Yu Y, Turchin MC, **Chiang CWK**, Meng Y, Demerath EW, Patel SR, Rich SS, Rotter JI, Schreiner PJ, Wilson JG, Shen Y, Wu BL, Hirschhorn JN. "Genome-wide association of copy number variation reveals an association between short stature and the presence of low frequency genomic deletions." **Am J Hum Genet**. 2011 Dec 9;89(6):751-9.
  7. **Chiang CWK**, Gajdos ZKZ, Korn JM, Butler JL, Hackett R, Guiducci C, Nguyen T, Wilks R, Forrester T, Henderson KD, Le Marchand L, Henderson BE, Haiman CA, Cooper RS, Lyon HN, Zhu X, McKenzie CA, Palmert MR, Hirschhorn JN. "The efficacy of detecting variants with small effects on the Affymetrix 6.0 platform using pooled DNA." **Hum Genet**. 2011 Nov;130(5):607-21.
  6. Zhu X, Young JH, Fox E, et al. "Combined admixture mapping and association analysis identifies a novel blood pressure genetic locus on 5p13: contributions from the CARE consortium." **Hum Mol Genet**. 2011 Jun 1;20(11):2285-95.
  5. Kang SJ\*, **Chiang CWK\***, Palmer CD\*, Tayo BO, Lettre G, Butler JL, Hackett R, Adeyemo AA, Guiducci C, Berzins I, Nguyen TT, Feng T, Luke A, Shriner D, Ardlie K, Rotimi C, Wilks R, Forrester T, McKenzie CA, Lyon HN, Cooper RS, Zhu X, Hirschhorn JN. "Genome wide association of anthropometric traits in African and African derived populations." **Hum Mol Genet**. 2010 Jul 1;19(13):2725-38.
  4. **Chiang CWK**, Gajdos ZKZ, Korn JM, Kuruvilla FG, Butler JL, Hackett R, Guiducci C, Nguyen T, Wilks R, Forrester T, Haiman C, Henderson KD, Le Marchand L, Henderson BE, Palmert MR, McKenzie CA, Lyon HN, Cooper RS, Zhu X, Hirschhorn JN. "Rapid assessment of genetic ancestry in populations of unknown origin by genome-wide genotyping of pooled samples." **PLoS Genet**. 2010;6(3):e1000866.
  3. **Chiang CWK\***, Derti A\*, Schwartz D, Chou MF, Hirschhorn JN, Wu C-t. "Ultraconserved elements: Analyses of dosage sensitivity, motifs, and boundaries." **Genetics**. 2008 Dec;180(4):2277-93.
  2. Keating BJ, Tischfield S, Murray SS, et al. "Concept, Design and Implementation of a Cardiovascular Gene-centric 50K SNP Array for Large-scale Genomic Association Studies." **PLoS ONE**. 2008;3(10):e3583.
  1. Dewing P, **Chiang CWK**, Sinchak K, Sim H, Fernagut P, Kelly S, Chesselet M, Micevych P, Albrecht



KH, Harley VR, Vilain E. "Direct regulation of adult brain function by the male-specific factor SRY." *Curr Biol*. 2006, Feb 21;16(4): 415-420.

### **Contributed Abstracts: Talks**

**bolded** name denotes group member

15. Hughley R, Darst BF, Andrews C, Berndt SI, Sheng X, Kote-Jaral Z, Lachance J, **Chiang CWK**, Jalloh M, Abediyi A, Aisuodionoe-Shadrac O, Adusei B, Mante S, Mensah J, Adjei A, Chanock SJ, Watya S, Eeles RA, Rebbeck TR, Conti DV, Haiman CA, MADCaP Consortium, PRACTICAL Consortium, and African Ancestry Prostate Cancer Consortium. "Germline *HOXB13* variant contributes to risk of prostate cancer in men of African ancestry." American Society of Human Genetics (ASHG), virtual, Oct 2021.
14. **Chiang CWK**, Fan C, Mancuso N. "A genealogical estimate of genetic relationships to improve detection of population structure over time." International Genetic Epidemiology Society (IGES), virtual, Oct 2021.
13. **Jeon S**, de Smith AJ, Musken IS, Metayer C, Ma X, Wiemels JL, **Chiang CWK**. "Multi-ethnic genome-wide association study of Acute Lymphoblastic Leukemia." International Genetic Epidemiology Society (IGES), Seoul, Korea, July 2020 (Online due to COVID-19). Best Poster/Lightning Talk Award.
12. **Chen M**, Sidore C, Akiyama M, Ishigaki K, Kamatani Y, Schlessinger D, Cucca F, Okada Y, **Chiang CWK**. "Evidence of polygenic adaptation at height-associated loci in mainland Europeans and Sardinians." Bay Area Population Genetics Meeting (BAPG), Berkeley, California, Nov 2019.
11. **Chen M**, Sidore C, Akiyama M, Ishigaki K, Kamatani Y, Schlessinger D, Cucca F, Okada Y, **Chiang CWK**. "Re-examining the evidence of polygenic adaptation at height loci in mainland European and Sardinia." Southern California Evolution Meeting (Scale), Irvine, California, Oct 2019.
10. Lettre G, Chen MH, Raffield L, Mousas A, Jiang T, Akbari P, Sakaue S, Bao EL, Lareau CA, **Chen M**, **Chiang CWK**, Okada Y, Sankaran VG, Soranzo N, Reiner A, Johnson AD, Auer P, Blood-Cell Consortium. "The genetic architecture of hematological traits within and between populations." American Society of Human Genetics (ASHG), Houston, TX, Oct 2019.
9. **Lin M**, Caberto C, Wan P, Lum-Jones A, Tiirikainen M, Le Marchand L, Wilkens L, Haiman C, Cheng I, **Chiang CWK**. "Oceanian reference panels are crucial for understanding the impact of a Polynesian-specific variant on adiposity in Native Hawaiians." 23andMe Genome Research Day, Mountain View, California, Jun 2019.
8. **Chiang CWK**, Mangul S, Robles C, Kretzschmar WW, Cai N, Kendler KS, Sankararaman S, Flint J. "A comprehensive map of genetic variation in the world's largest ethnic group – Han Chinese." Society for Molecular Biology & Evolution (SMBE), Yokohama, Japan, Jul 2018.
7. **Chiang CWK**, Locke AE, Steinberg KM, Service S, Abel H, Havulinna AS, Chiang C, Stell L, Stringham HM, Jackson AU, Pirinen M, Ray D, Larson DE, Koboldt DC, Scott LJ, Fulton RS, Nelson J, Nicholas TJ, Yajnik P, Ramensky V, Stitzel NO, Wilson RK, Hall IM, Sabatti C, Ripatti S, Salomaa V, Palotie A, Laakso M, Boehnke M, Freimer NB. "Insights to the population structure and genetic architecture of cardiometabolic traits in 20,029 Finnish exomes." American Society of Human Genetics (ASHG) Orlando, FL, Oct 2017.
6. **Chiang CWK**, Locke AE, Steinberg KM, Service S, Abel H, Havulinna AS, Chiang C, Stell L, Stringham HM, Jackson AU, Pirinen M, Ray D, Larson DE, Koboldt DC, Scott LJ, Fulton RS, Nelson J, Nicholas TJ, Yajnik P, Ramensky V, Stitzel NO, Wilson RK, Hall IM, Sabatti C, Ripatti S, Salomaa

V, Palotie A, Laakso M, Boehnke M, Freimer NB. "Insights to the genetic architecture of cardiometabolic traits empowered by 20,000 exomes and the history of Finland." Gordon Research Conference (GRC), Human Genetics & Genomics, Stowe, VT, Jul 2017.

5. **Chiang CWK**, Sidore C, Zoledziwska M, Marcus JH, Al-asadi H, Abecasis GR, Schlessinger D, Cucca F, Novembre J. "Population genetic insight to the study of human height." International Society Evolution, Medicine & Public Health (ISEMPH), Durham, NC, Jun 2016.
4. Novembre J, **Chiang CWK**, Marcus J, Sidore C, Zoledziwska M, Steri M, Al-asadi H, Sanna S, Abecasis G, Schlessinger D, Cucca F. "The population structure and demographic history of Sardinia in relationship to neighboring populations." American Society of Human Genetics (ASHG), San Diego, CA, Oct 2014.
3. **Chiang CWK**, Ralph P, Novembre J. "Conflations of short IBD blocks can bias inferred length of IBD blocks." Society for Molecular Biology & Evolution (SMBE), San Juan, PR, Jun 2014.
2. Turchin MC, **Chiang CWK**, Palmer CD, Hirschhorn JN, GIANT consortium. "Intra-European allele frequency differences at height-associated SNPs suggest widespread selection on standing variation." Cold Spring Harbor Laboratory (CSHL), The Biology of Genomes, Cold Spring Harbor, NY, May 2011.
1. **Chiang CWK**, Dewing P, Vilain E. "The genetic effect of the male-determining gene Sry on brain sexual dimorphism and function." Southern California Conference of Undergraduate Research (SCCUR), Whittier College, Whittier, CA, Nov. 2004.

### **Contributed Abstracts: Posters (Last 3 Years)**

**bolded** name denotes group member

36. **Chan TF**, **Chiang CWK**, Mancuso N. "Estimating heritability explained by local ancestry and evaluating stratification bias in admixture mapping from summary statistics." American Society of Human Genetics (ASHG), virtual, Oct 2021.
35. **Chiang CWK**, **Fan C**, Mancuso N. "A genealogical estimate of genetic relationships to improve detection of population structure over time." American Society of Human Genetics (ASHG), virtual, Oct 2021.
34. **Fan C**, Mancuso N, **Chiang CWK**. "A genealogical estimate of genetic relationships." Society of Molecular Biology and Evolution (SMBE), virtual, Jul 2021.
33. **Chen M** and **Chiang CWK**. "Evidence of polygenic adaptation within Europeans and among continental populations" Society of Molecular Biology and Evolution (SMBE), virtual, Jul 2021.
32. Qin X, **Chiang CWK**, Gaggiotti O. "Detecting signals of natural selection via deep learning" Society of Molecular Biology and Evolution (SMBE), virtual, Jul 2021.
31. **Chan TF**, **Chiang CWK**, Mancuso N. "Estimating heritability explained by local ancestry and evaluating confounding bias in admixture mapping from summary statistics." Biology of Genomes, CSHL, Cold Spring Harbor, NY, May 2021 (Online due to COVID-19).
30. **Fan C**, Mancuso N, **Chiang CWK**. "A genealogical estimate of genetic relationships." Probabilistic Modeling in Genomics, CSHL, Cold Spring Harbor, NY, Apr 2021 (Online due to COVID-19).
29. Kachuri L, **Jeon S**, Dewan AT, Metayer C, Ma X, **Chiang CWK**, Wiemels JL, de Smith AJ. "Genetic

determinants of blood cell traits play a role in susceptibility to acute lymphoblastic leukemia.” American Society of Hematology (ASH), San Diego, CA, Dec 2020.

28. **Fan C**, Mancuso N, **Chiang CWK**. “A genealogical estimate of genetic relationships.” American Society of Human Genetics (ASHG), San Diego, CA, Oct 2020 (Online due to COVID-19). Reviewer’s Choice Abstract
27. **Chiang CWK**, **Lin M**, **Sun H**, Russell EM, Minster RL, **Chan TF**, Naseri T, Reupena MS, Lum-Jones A, Cheng I, Wilkens LR, Le Marchand L, Haiman CA. “The challenges to study the impact of Polynesian genetic ancestry on the architecture of complex traits in Native Hawaiians.” American Society of Human Genetics (ASHG), San Diego, CA, Oct 2020 (Online due to COVID-19).
26. **Chen M**, **Chiang CWK**. “Polygenic adaptation at height-associated loci among continental populations.” American Society of Human Genetics (ASHG), San Diego, CA, Oct 2020 (Online due to COVID-19).
25. **Jeon S**, de Smith AJ, Muskens IS, Dewan AT, Metayer C, Ma X, Wiemels JL, **Chiang CWK**. “Multi-ethnic genome-wide association study identified novel loci associated with childhood acute lymphoblastic leukemia.” American Society of Human Genetics (ASHG), San Diego, CA, Oct 2020 (Online due to COVID-19). Reviewer’s Choice Abstract
24. **Fan C**, Mancuso N, **Chiang CWK**. “A genealogical estimate of genetic relationships.” Biology of Genomes, CSHL, Cold Spring Harbor, NY, May 2020 (Online due to COVID-19).
23. **Lin M**, Caberto C, Wan P, Lum-Jones A, Tiirikainen M, Pooler L, Nakamura B, Sheng X, Le Marchand L, Wilkens L, Haiman C, Cheng I, **Chiang CWK**. “Oceanian reference panels are crucial for understanding the impact of a Polynesian-specific variant on adiposity in Native Hawaiians.” American Society of Human Genetics (ASHG), Houston, TX, Oct 2019.
22. **Chen M**, Akiyama M, Sidore C, Ishigaki K, Okada Y, Kamatani Y, Schlessinger D, **Chiang CWK**. “Re-examining the evidence for polygenic adaptation at height-associated loci in mainland Europe and Sardinia.” American Society of Human Genetics (ASHG), Houston, TX, Oct 2019. Reviewer’s Choice Abstract
21. **Chen M**, Akiyama M, Sidore C, Ishigaki K, Okada Y, Kamatani Y, Schlessinger D, **Chiang CWK**. “Re-examining the evidence for polygenic adaptation at height-associated loci in mainland Europe and Sardinia.” Gordon Research Conferenec (GRC), Human Genetics & Genomics, Waterville, NH, Jul 2019.
20. **Sun H**, **Lin M**, Wilkens L, Le Marchand L, Haiman CA, **Chiang CWK**. “The impact of global and local Polynesian genetic ancestry on complex traits in Native Hawaiians.” Biology of Genomes, CSHL, Cold Spring Harbor, NY, May 2019.
19. **Chen M**, Akiyama M, Sidore C, Ishigaki K, Okada Y, Kamatani Y, Schlessinger D, **Chiang CWK**. “Re-examining the evidence of polygenic adaptation at height-associated loci in mainland Europe and Sardinia.” Biology of Genomes, CSHL, Cold Spring Harbor, NY, May 2019.

## **Report of Funded Projects**

<u>Current</u> Years	Role	Source	Total Costs
2021-2026	PI	NIGMS R35GM142783	\$2,035,683



An evolutionary framework to elucidate and interpret the genetic architecture of complex traits in diverse populations

2021-2026          co-I          (PI: Mancuso)          NHGRI R01HG012133          \$4,205,166  
Characterizing the evolutionary architecture of complex disease within and across diverse populations

Pending

2022-2027          PI          NHGRI R01HG011646          \$3,996,329  
Leveraging the evolutionary history to improve identification of trait-associated alleles and risk stratification models in Native Hawaiians

**Mentored Trainee Grants**

2022-2025          Mentor          (PI: Bryan L. Dinh)          NHGRI F31HG012159          \$138,108  
Genomic resources and references for genetic investigation of an understudied population

**Invited Talks and Colloquia**

2021.10.06      American Association for Cancer Research (AACR) Conference on The Science of Cancer Health Disparity.  
Session on “Heterogeneity Within the Asian and Pacific Islander Diaspora”  
Virtual due to COVID

2020.01.22      Department Seminar, Department of Genetics  
University of Georgia, Athens, GA.

2019.09.09      Institute Seminar, International Laboratory of Human Genome Research (LIIGH)  
National University of Mexico (UNAM), Queretero, Mexico.

2019.08.29      Department Seminar, Quantitative Computational Biology Section  
Department of Biological Sciences, USC, Los Angeles, CA.

2018.06.08      Informatics Center for Neurogenetics and Neurogenomics (ICNN) Symposium  
University of California, Los Angeles (UCLA), Los Angeles, CA.

2018.04.18      Asian Evo Conference  
Symposium on “Human Evolution and Adaptation”  
China National GeneBank, Shenzhen, China.

2018.04.13      Institute Seminar, Institute of Biomedical Sciences (IBMS)  
Academia Sinica, Taipei, Taiwan.

2017.04.13      Department Seminar, Center for Genetic Epidemiology  
University of Southern California, Los Angeles, CA.

2017.02.23      Department Seminar, Virginia Institute for Psychiatric and Behavioral Genetics (VIPBG)  
Virginia Commonwealth University, Richmond, VA.

2017.01.26      Department Seminar, Department of Anthropology  
University of Utah, Salt Lake City, UT.

2015.05.06      Institute Seminar, CAS-MPG Partnered Institute of Computational Biology  
Chinese Academy of Science, Shanghai, China.

2015.04.30      Department Seminar, Center for Genomic Sciences  
University of Hong Kong, Hong Kong, SAR, China.

2015.04.09      Institute Seminar, Institute of Biomedical Sciences (IBMS)  
Academia Sinica, Taipei, Taiwan.

## **Academic Awards and Recognitions**

2020	Undergraduate Research Associate Program Award, USC (To support undergraduate researchers S. Rashid and S. Sommerer in AY 2020-21)
2017	ASHG Charles J. Epstein Trainee Award for Excellence in Human Genetics Research (Semifinalist)
2013-2015	National Institute of Health NRSA Postdoctoral Fellowship, F32
2010	Summer Institute in Statistical Genetics Travel Scholarship
2007-2010	National Science Foundation Graduate Fellowship
2005	Director's Fellowship, Yale University (declined)
2005	Phi Beta Kappa Society
2004	Ira J. and Shirley Spoon Honors Collegium Scholarship, UCLA
2003	Golden Key International Honour Society
2001	CRC Press Freshmen Chemistry Achievement Award
2001	The National Society of Collegiate Scholar
2001	Alpha Lambda Delta Honor Society
2001	Phi Eta Sigma Honor Society

## **Mentored Student and Postdocs**

Abbreviations: **PIBBS**, Programs in Biomedical and Biological Sciences PhD program; **CBB**, Computational Biology and Bioinformatics PhD program; **MBBO**, Marine Biology and Biological Oceanography PhD program; **QB**, Quantitative Biology undergraduate program, USC; **CS**, Computer Science undergraduate program, USC.

Year	Name	Program	Role
<u><i>Current Trainee</i></u>			
2021-current	Ying-Chu Lo, Ph.D.	USC-Taiwan Postdoctoral Fellow, USC	Postdoc advisor
2021-current	Xinghu Qin, Ph.D.	Postdoctoral Fellow, USC	Postdoc advisor
2018-current	Soyoung Jeon	Ph.D. student, PIBBS, USC	Co-PhD advisor
2019-current	Caoqi Fan	Ph.D. student, CBB, USC	PhD advisor
2019-current	Tsz Fung Chan	Ph.D. student, Epidemiology, USC	Co-PhD advisor
2020-current	Bryan Dinh	Ph.D. student, CBB, USC	PhD advisor
2020-current	Xinyue (Camellia) Rui	B.S./M.S. student, Mathematics USC Fall 2020 Provost Fellowship, Jennifer Battat USC Scholarship	MS advisor
2020-current	Sydney Rashid	B.S. student, QB, USC	--
2021-current	Echo Tang	B.S. student, QB, USC	--
2021-current	Jordan Cahoon	B.S. student, CS, USC	--
2021-current	Christopher Simons	B.S. student, QB, USC	--
<u><i>Graduate Student Committees</i></u>			
2019-current	Olzhas Iksan	Ph.D. student, Genetics, Kazakh National Univ.	Dissertation committee (external)
2020	Maria Ruggeri	Ph.D. student, MBBO, USC	Qualifying Exam committee (external)
2021	Qianxi (Senkei) Feng	Ph.D. student, Epidemiology, USC	Qualifying Exam committee member
<u><i>Former Trainee</i></u>			
2018-2019	Hanxiao Sun	M.S. student, Biostatistics, USC	MS advisor
2018-2020	Meng Lin, Ph.D.	Postdoctoral Fellow, USC	Postdoc advisor
2018-2021	Minhui Chen, Ph.D.	Postdoctoral Fellow, USC	Postdoc advisor
2019-2020	Samuel Sommerer	B.S. student, QB/Comp Sci, USC	--

### Rotation Students

2018 Spring	Kuo-chang Tseng	Rotation student, PIBBS, USC	--
2018 Spring	Charles Bramlett	Rotation student, PIBBS, USC	--
2018 Fall	Audrey Nickle	Rotation student, PIBBS, USC	--
2021 Summer	Dandan Peng	Rotation student, CBB, USC	--

### Teaching

2021	Course Director, University of Southern California PM 534 (Statistical Genetics: Introduction to Medical Population Genetics) 3 units, Fall Term
2020	Guest Lecturer, University of Southern California PM 533 (Genetic and Molecular Epidemiology), 1hr/term, Fall Term
2020	Guest Lecturer, University of Hawai'i Cancer Center Multiethnic Cohort T32 Postdoctoral Fellowship Seminar Series, 1hr, Spring Term
2019-2021	Guest Lecturer, University of Southern California BISC 577A (Computational Biology Laboratory), 2hrs/term, Fall Term
2009	Teaching Assistant, Harvard University. LS1B (Genetics, Genomics, and Evolution), Spring Term
2008	Guest Lecturer, Harvard Medical School. Genetics 228 (Genetics in Medicine; "Using Genetics Databases"), Fall Term
2007	Teaching Assistant, Harvard Medical School. Genetics 228 (Genetics in Medicine), Fall Term

### Departmental and University Service

Abbreviations: **CGE**, Center for Genetic Epidemiology; **PIBBS**, Programs in Biomedical and Biological Sciences PhD program; **DPM**, Department of Preventive Medicine, USC; **QCB**, Department of Quantitative Computational Biology, USC.

Year	Role	Service
2021	Member	CGE Scientific Review Committee
2021-present	Member	DPM Junior Faculty Committee
2021	Member	DPM Statistical Genetics Curriculum Committee
2020-present	Chair	CGE Seminar Series
2020-present	Webmaster	CGE webpage design and launch
2019-present	Co-chair (2020-2021), Member (2019)	DPM Epidemiology Ph.D. Admission Committee
2019-2020	Member	PIBBS Ph.D. Admission Committee
2019	Member	QCB Faculty Search Committee
2018	Member	DPM Biostatistics Ph.D. Admission Committee

### Professional Services and Scientific Communities

#### **Editorship and Editorial Board:**

Review Editor (Frontier in Genetics, 2018-2021)  
Associate Editor (Frontier in Genetics, 2021-)

#### **Invited Manuscript Reviewer:**

Nature  
Am J of Hum Genet  
PNAS  
Genetics  
PLoS Genetics  
Eur J of Hum Genet  
Scientific Reports

Nature Genetics  
Science  
Molecular Biology and Evolution  
G3: Genes, Genomes, Genetics  
PLoS Computational Biology  
Human Genetics  
Nutrition and Diabetes

Nature Communications  
Science Advances  
Human Molecular Genetics  
Bioinformatics  
PLoS ONE  
Frontiers in Genetics

### **American Society of Human Genetics (ASHG):**

**Member**, 2007-present

**Judge**, DNA Day Essay Contest, 2014, 2015, 2017, 2021

**Program Abstract Reviewer**, Evolutionary and Population Genetics, 2017

**Mentor**, Trainee-Mentor Luncheon, Evolution and Population Genetics, 2019

**Member, Awards Committee**, 2021-2023

### **Invited Grant Reviewer:**

**Human Frontier Science Program** (Mail-in Reviewer, 2018)

**Medical Research Council NIRG** (Reviewer, 2019)

**Symposia Organizer**: 1st AsiaEvo Conference (2018)

### **Member:**

American Society for Human Genetics (ASHG)

Society for Molecular Biology & Evolution (SMBE)

American Association of Physical Anthropologists (AAPA)

## **Media Appearances, Engagement, and Coverage**

“COVID-19 vaccine eligibility expands to anyone over the age of 16 in L.A. county”

*USC Annenberg Media*, Apr 13, 2021

<https://www.uscannenbergmedia.com/2021/04/13/covid-19-vaccine-eligibility-expands-to-anyone-over-the-age-of-16-in-la-county/>

“Polynesian ancestry linked to obesity in study of Native Hawaiians”

*Genetic Obesity News*, Feb 15, 2021

<https://geneticobesitynews.com/2021/02/15/polynesian-ancestry-linked-obesity-diabetes-heart-disease-risk-study/>

“Native Hawaiian genetic ancestry linked to metabolic diseases”

*The Academic Times*, Feb 11, 2021

<https://academictimes.com/native-hawaiian-genetic-ancestry-linked-to-metabolic-diseases/>

“Global, Local Polynesian Ancestry Influence Disease Risk Among Native Hawaiians”

*Genomeweb*, Feb 11, 2021

<https://www.genomeweb.com/genetic-research/global-local-polynesian-ancestry-influence-disease-risk-among-native-hawaiians#.YCWPKBNKjBI>

“Genetic ancestry linked to diabetes, heart failure and obesity among Native Hawaiians”

*Keck School of Medicine News*, Feb 11, 2021

<https://keck.usc.edu/genetic-ancestry-linked-to-diabetes-heart-failure-and-obesity-among-native-hawaiians/>

“Polynesian ancestry linked to obesity, diabetes in Native Hawaiians”

*Honolulu Star Advertiser*, Feb 11, 2021

<https://www.staradvertiser.com/2021/02/11/breaking-news/polynesian-ancestry-linked-to-obesity-diabetes-in-native-hawaiians/>

“Genetics contributes to diabetes, HF, obesity risk in Native Hawaiian individuals”

*Healio*, Feb 11, 2021

[https://www.healio.com/news/cardiology/20210211/genetics-contributes-to-diabetes-hf-obesity-risk-in-native-hawaiian-individuals?utm\\_medium=social&utm\\_source=twitter&utm\\_campaign=scheduledpost](https://www.healio.com/news/cardiology/20210211/genetics-contributes-to-diabetes-hf-obesity-risk-in-native-hawaiian-individuals?utm_medium=social&utm_source=twitter&utm_campaign=scheduledpost)

“Accuracy of Genotyping Chips Called into Question”

*The Scientist*, Jul 24, 2019

<https://www.the-scientist.com/news-opinion/accuracy-of-genotyping-chips-called-into-question--66198>

“Hidden Stories of Chinese Migration and Culture Found in Giant Genetic Study”

*The New York Times*, Oct 5, 2018

<https://www.nytimes.com/2018/10/05/science/china-genetics.html>

## **Outreach and Community Services**

### **Hoyt Art Gallery, USC**

*Community outreach pairing local visual artist with biomedical researcher to collaborate for innovative artistic representation of ongoing research at Keck School of Medicine*

2018                      Partnered Biomedical Researcher

### **“How to get a postdoc” workshop, Department of Ecology and Evolutionary Biology, UCLA**

2015                      Panelist

### **Science in the News, Boston, MA.**

*Science in the News* is a free evening seminar series for the public aimed at explaining and discussing today's hottest scientific topics without the hype or exaggeration often introduced by media coverage.

2005-2006              Lecture Coordinator

“Stem Cells: Hope or Hype?” lecture series (2005)

“Obesity and Diabetes” lecture series (2006)

### **MATHCOUNTS, Suzanne Middle School, Walnut, CA**

*MATHCOUNTS* is a nation-wide program for 6th to 8th grade students designed to elicit interest in mathematics through teamwork and competition.

2003-2005              Head Coach, Suzanne Middle School

1999-2003              Assistant Coach, Suzanne Middle School

2006, 2008, 2013      Volunteer, East San Gabriel Valley Chapter, CA