

Charleston W.K. Chiang

Curriculum Vitae

Academic Appointment

Assistant Professor, University of Southern California 2017-present
Center for Genetic Epidemiology, Department of Preventive Medicine
Keck School of Medicine

Education

Ph.D., Harvard University 2011
Genetics; Division of Medical Sciences, Program in Biological and Biomedical Science
Leder Human Biology and Translational Medicine Program Scholar

B.S., University of California, Los Angeles 2005
Microbiology, Immunology, and Molecular Genetics (Major)
Mathematics, Statistics (Minors)
Summa Cum Laude, College Honors Program Scholar

Past Employment / Research Experience

Postdoctoral Research Fellow, Semel Institute for Neuroscience, UCLA 7/2015 – 11/2017[#]
Advisor: Nelson B. Freimer, M.D., Center for Neurobehavioral Genetics
Project: Genetic mapping of cardiometabolic phenotypes in isolated Finnish populations.

Postdoctoral Research Fellow, UCLA 11/2011 – 3/2015[#]
Advisor: John Novembre, Ph.D., Dept. of Ecology and Evolutionary Biology
Funding: NIH NRSA F32 Individual Postdoctoral Fellowship
Project: Using whole genomes to study demography and mapping power of a population isolate

Graduate Student, Harvard Medical School, Broad Institute 9/2005 – 9/2011
Thesis Advisor: Joel N. Hirschhorn, M.D. Ph.D., Department of Genetics
Funding: NSF Graduate Student Fellowship
Dissertation: Considerations of evolutionary conservation and genetic ancestry in human genetic association studies

Undergraduate Research Assistant, UCLA 4/2002 – 6/2005
Advisor: Eric Vilain, M.D. Ph.D., Department of Human Genetics
Project: The genetic effect of male-determining gene *Sry* on tyrosine hydroxylase expression in the murine brain

[#]include parental leaves in 2013 and 2016.

Publications (10 first or co-first author, 14 top-three author publications)

*, # denote equal contribution

23. **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" *Submitted to Genome Research. BioRxiv:* <http://www.biorxiv.org/content/early/2017/07/13/162982>. doi: 10.1101/162982
22. **Chiang CWK**, Marcus J, Sidore C, 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. "Population history of the Sardinian people revealed from whole-genome sequencing" *In revision at Nature Genetics. BioRxiv:* <http://biorxiv.org/content/early/2016/12/07/092148>. doi: 10.1101/092148
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 Oct 18. pii: ddw346. doi: 10.1093/hmg/ddw346. [Epub ahead of print]
19. **Chiang CWK**, Ralph, P, Novembre J. "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 Genetics.* 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." *Nature Genetics.* 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." *Nature Genetics.* 2015 Nov;47(11):1352-6. doi: 10.1038/ng.3403. *Led the population genetic analyses*
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 Genetics. 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.

Selected Abstracts and Presentations

(Only those in which I have contributed significantly to the analysis and presentation of abstract)

22. **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. **Contributed Talk.**
21. **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. **Contributed Talk.**
20. **Chiang CWK**, Marcus J, Sidore C, Zoledziwska M, Steri M, Al-asadi H, Sanna S, Abecasis GR, Schlessinger D, Cucca F, Novembre J. "Using whole-genome sequencing to shed insight on the complex prehistory of Sardinia." American Society of Human Genetics (ASHG), Vancouver, Canada, Oct 2016. **Reviewer's Choice Abstract.**
19. Marcus JH, **Chiang CWK**, Novembre J. "Testing directional selection on polygenic traits using ancient DNA." American Society of Human Genetics (ASHG), Vancouver, Canada, Oct 2016.
18. **Chiang CWK**, Locke AE, Steinberg KM, Service S, Abel H, Ramensky V, Pirinen M, Stell L, Stringham HM, Jackson AU, Yajnik P, Ray D, Larson DE, Koboldt DC, Scott LJ, Fulton RS, Nelson J, Nicholas TJ, Stitzel NO, Hall IM, Sabatti C, Ripatti S, Salomaa V, Palotie A, Laakso M, Boehnke M, Wilson RK, Freimer NB. "Insights to the genetic architecture of cardiometabolic traits and population structure in 20,029 Finnish exomes." UCLA Cardiovascular Symposium, Los Angeles, CA, Sep 2016.
17. **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. **Contributed Talk.**
16. Novembre J, **Chiang CWK**, Marcus J, Sidore C, Zoledziwska M, Steri M, Al-asadi H, Sanna S,

- Abecasis G, Schlessinger D, Cucca F, Novembre J. "The population structure and demographic history of Sardinia in relationship to neighboring populations." American Society of Human Genetics (ASHG), San Diego, CA, Oct 2014. **Contributed Talk.**
15. **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. **Contributed Talk.**
 14. **Chiang CWK**, Novembre J. "Conflation of short IBD blocks can bias inferred length of IBD blocks." American Society of Human Genetics (ASHG), Boston, MA, Oct 2013.
 13. **Chiang CWK**, Li J, Ehm MG, Nelson MR, Novembre J. "A population genetic measure of the *de novo* mutation rate using identity-by-descent estimates." American Society of Human Genetics (ASHG), San Francisco, CA, Nov 2012.
 12. **Chiang CWK**, Turchin MC, Palmer CD, Sankararaman S, Reich D, GIANT consortium, Hirschhorn JN. "Evidence of widespread selection on standing variation in Europe at height-associated SNPs." 1000 Genomes Community Meeting, Ann Arbor, MI, Jul 2012.
 11. **Chiang CWK**, Turchin MC, Palmer CD, Sankararaman S, Reich D, GIANT consortium, Hirschhorn JN. "Intra-European allele frequency differences at height-associated SNPs suggest widespread selection on standing variation." Gordon Research Conferenec (GRC), Human Genetics & Genomics, Newport, RI, Jul. 2011.
 10. Wang SR, **Chiang CWK**, Daly MJ, Palotie A, Salomaa V, Hirschhorn JN. "Assessing the Finnish founder effect using next-generation sequencing data." Gordon Research Conference (GRC), Human Genetics & Genomics, Newport, RI, Jul. 2011.
 9. 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. **Contributed Talk.**
 8. **Chiang CWK**, Nguyen TT, Palmer CD, Kang SJ, Hassanein MT, Lyon HN, McKenzie CA, Henderson B, Cooper RS, Zhu X, Haiman CA, Hirschhorn JN. "Genome-wide association and signal fine-maping for variants associated with BMI in African-derived populations." Smith Family Awards Program for Excellence in Biomedical Research Scientific Poster Session, Boston, MA, May 2010.
 7. **Chiang CWK**, Kang SJ, Tayo B, Palmer CD, Lettre G, Butler JL, Hackett R, Guiducci C, Nguyen T, Adeyemo A, Rotimi C, Luke A, Lyon HN, Cooper R, Hirschhorn JN, Zhu X. "A genome-wide survey of SNPs and CNVs for association to body mass index in 1,931 individuals from African-derived populations." American Society of Human Genetics (ASHG), Honolulu, HI, Oct. 2009.
 6. Gajdos ZKZ, **Chiang CWK**, Korn JM, Kuruvilla FG, Butler JL, Hackett R, Guiducci C, Nguyen T, Lyon HN, Henderson KD, Haiman C, Le Marchand L, Henderson B, Palmert MR, Wilks R, Forrester T, McKenzie CA, Cooper RS, Zhu X, Hirschhorn JN. "Genome-wide genotyping of pooled samples for ancestry assessment of population of unknown origin." American Society of Human Genetics (ASHG), Honolulu, HI, Oct. 2009.
 5. **Chiang CWK**, Gajdos ZKZ, Kuruvilla FG, Korn JM, Butler JL, Hackett R, Guiducci C, Nguyen T, Lyon HN, Wilks R, Forrester T, Haiman C, Henderson KD, Le Marchand L, Henderson BE, Palmert MR, McKenzie CA, Cooper RS, Zhu X, Hirschhorn JN. "Rapid assessment of genetic ancestry in populations of unknown origin by genome-wide genotyping of pooled samples." Gordon Research Conferenec (GRC), Human Genetics & Genomics, Biddeford, ME, Jul. 2009.

4. **Chiang CWK**, Gajdos ZKZ, Kuruville FG, Korn JM, Hackett R, Butler JL, Guiducci C, Lyon H, Henderson KD, Cooper R, Zhu X, Le Marchand L, Henderson BE, Palmert MR, Hirschhorn JN. "Empirical evaluation of genome-wide allelotyping on pooled DNA samples." American Society of Human Genetics (ASHG), Philadelphia, PA, Nov. 2008.
3. Kang SJ, Tayo B, **Chiang CWK**, Feng T, Adeyemo A, Rotimi C, Luke A, Cooper R, Hirschhorn J, Zhu X, Lyon H. "A Genome-wide association study of body mass index (BMI) in African-origin samples." American Society of Human Genetics (ASHG), Philadelphia, PA, Nov. 2008.
2. **Chiang CWK**, Derti A, Hirschhorn JN, Wu C-t. "Depletion Analysis of Ultraconserved Elements among Copy Number Variants." American Society of Human Genetics (ASHG), San Diego, CA, Oct. 2007.
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 Talk.**

Invited Talks and Colloquia

AsianEvo Conference, China National GeneBank, <i>Shenzhen, China</i>	Apr 18, 2018
Center for Genetic Epidemiology, University of Southern California, <i>Los Angeles, CA</i> (host: Dr. Christopher Haiman)	Apr 13, 2017
Virginia Institute for Psychiatric and Behavioral Genetics (VIPBG), Virginia Commonwealth University, <i>Richmond, VA</i> (host: Dr. Kenneth Kendler)	Feb 23, 2017
Department of Anthropology, University of Utah, <i>Salt Lake City, UT</i> (host: Dr. Leslie Knapp)	Jan 26, 2017
Chinese Academy of Science and German Max Planck (CAS-MPG) Partnered Institute of Computational Biology, <i>Shanghai, China</i> (host: Dr. Shuhua Xu)	May 6, 2015
Center of Genomic Sciences, University of Hong Kong, <i>Hong Kong, SAR, China</i> (host: Dr. Pak Sham)	Apr 30, 2015
Institute of Biomedical Sciences, Academia Sinica, <i>Taipei, Taiwan</i> (hosts: Drs. Cathy Fann and Chen-Yang Shen)	Apr 9, 2015

Academic Awards and Recognitions

ASHG Charles J. Epstein Trainee Award for Excellence in Human Genetics Research - Semifinalist	2017
National Institute of Health NRSA Postdoctoral Fellowship, F32	2013-2015
Summer Institute in Statistical Genetics Travel Scholarship	2010
National Science Foundation Graduate Fellowship	2007-2010
Director's Fellowship, Yale University (<i>declined</i>)	2005
Phi Beta Kappa Society	2005

Ira J. and Shirley Spoon Honors Collegium Scholarship, UCLA	2004
Golden Key International Honour Society	2003
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	2001

Teaching, Outreach, and Community Services

Judge, DNA Day Essay Contest, American Society of Human Genetics (ASHG). 2014-15,17

Panelist, How to get a postdoc workshop, Ecology and Evolutionary Biology, UCLA Nov 2015

Teaching Fellow / Assistant, Harvard University, Cambridge, MA

- Genetics 228: Genetics in Medicine Fall 2007
- LS 1B: Genetics, Genomics, and Evolution Spring 2009

Guest Lecturer, Harvard University, Cambridge, MA

- Genetics 228: Genetics in Medicine: "Using Genetic Databases" Fall 2008

Lecture Coordinator, 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.

- "Stem Cells: Hope or Hype?" lecture series. Fall 2005
- "Obesity and Diabetes" lecture series. Fall 2006

Coach and Volunteer, 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.

Head Coach, Suzanne Middle School, Walnut, CA 2003-2005

- 1st place finish, East San Gabriel Valley Chapter Competition, 2004.
- Best First Year Coach Award, Southern California State Competition, 2004.

Assistant Coach, Suzanne Middle School, Walnut, CA 1999-2003

- Top 4 finish, East San Gabriel Valley Chapter, 2000-2003

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

Professional Services and Scientific Communities

Abstract Reviewer: American Society of Human Genetics (Evolutionary and Population Genetics)

Reviewer: American Journal of Human Genetics; PLoS Genetics; Human Molecular Genetics; European Journal of Human Genetics; PLoS ONE; Nutrition and Diabetes; G3: Genes, Genomes, Genetics;

Symposia Organizer: 1st AsiaEvo Conference (2018)

Member: Society for Molecular Biology & Evolution, American Society for Human Genetics