Curriculum Vitae

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Name: Anne-Marie Chang

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Place of Birth: Evanston, Illinois

Education

1992	B.S.	Biology	Loyola University of Chicago, Chicago, IL
1992	B.A.	English Literature	Loyola University of Chicago
2003	Ph.D.	Neuroscience (Dr. J. Takahashi)	Northwestern University, Evanston, IL

Postdoctoral Training

2003-2011	Postdoctoral Fellow	Sleep Medicine (Dr. C. Czeisler)	Harvard Medical School, Boston, MA

Appointments at Academic/Hospitals/Affiliated Institutions

2003-2011	Research Fellow	Sleep Medicine	Brigham and Women's Hospital, Boston, MA
2011-2014	Instructor	Medicine	Harvard Medical School, Boston, MA
2011-	Associate Neuroscientist	Sleep Medicine	Brigham and Women's Hospital, Boston, MA
2014-	Assistant Professor	Biobehavioral Health	The Pennsylvania State University

Committee Service

2004-2014	Lighting Committee	BWH, Division of Sleep Medicine Member
2008-2014	Screening Committee	BWH, Division of Sleep Medicine Member
2009-2012	Postdoctoral Leadership Council	BWH Member
2014-2015	BBH Methodology Faculty Search Committee	Penn State, Biobehavioral Health Department
2014-2015	College of Nursing Sleep Faculty Search	Penn State, College of Nursing

	Committee	
2014-present	College of Nursing Graduate Affairs	Penn State, College of Nursing
2014- present	College of Nursing PhD Council	Penn State, College of Nursing
2015-2017	College of Nursing DNP Committee	Penn State, College of Nursing
2015-2017	Co-chair BBH Colloquium Series	Penn State, Biobehavioral Health Department
2015- present	BBH Founder's Day Committee	Penn State, Biobehavioral Health Department
2015-2017	Wellness Clinic Task Force	Penn State, College of Nursing
2016-2018	BBH Advisory Committee	Penn State, Biobehavioral Health Department
2018- present	BBH Faculty Development Committee	Penn State, Biobehavioral Health Department

Professional Societies

1998- present	Society for Research of Biological Rhythms	
	1998-	Member
1999- present	Sleep Research Society	
	1999-	Member

Editorial Activities

Editorial Board		**Date of Service**
Sleep Health		January 2016 - present
Ad hoc Reviewer	**# Reviews**	**Year of Review**
American Journal of Psychiatry	1	2017
Biological Research for Nursing	1	2014
Journal of Adolescence	1	2012
Journal of Biological Rhythms	8	2006 (2), 2007, 2011, 2012, 2013, 2015, 2017
Journal of Research on Adolescence	1	2016
Journal of Sleep Research	1	2018
NeuroImage	1	2014
Obesity	1	2011
The Open Sleep Journal	1	2012
Pediatrics	1	2017
PLoS One	3	2015 (2), 2017
Sleep	2	2006, 2016
Sleep Health	5	2014, 2015, 2016, 2017 (2)
Ubicomp 2015	1	2015

Grant Reviews

Intramural

Ad hoc Reviewer	**# Reviews**	**Year of Review**
Clinical and Translational Sciences Institute (CTSI)	2	2015, 2016
Social Science Research Institute (SSRI)	4	2014, 2015, 2016, 2017
College of Nursing Mock Grant Reviews	2	2015, 2016

Extramural

2016	NIH/NINDS Neurological Sciences Training (NST)	Ad hoc reviewer
2017-present	NIH/NINDS Neurological Sciences Training (NST)	Member
2017	NIH/NINDS F99/K00 Study Section	
2018	NIH/NHLBI K01 Diversity Section	

Honors and Prizes

2012	Faculty Career Development Award	BWH/Eleanor and Miles Shore Fellowship for Scholars in Medicine

Report of Funded and Unfunded Projects

Funding Information

Past

1998-1999	Genetic Characterization of Advanced Sleep Phase Syndrome (Zee)
	Individual investigator initiated grant, Army Research Office DAAG55-98-1-0459
	Project Leader, Pre-doctoral Fellow
	The goal of this study was to identify the genetic mechanisms of a circadian rhythm sleep disorder advanced sleep phase syndrome. I led the collection and analysis of the genetic data and the preparation of the manuscript.
1998-2001	Sleep Research Training Grant Pre-doctoral Fellowship (Turek)
	Institutional training grant, NIH T32 HD07909
	Pre-doctoral Fellow
2000	Genetic Characterization of Advanced Sleep Phase Syndrome (Zee)
	Research, Brookdale National Foundation
	Project Leader, Pre-doctoral Fellow
	The goal of this study was to identify the genetic loci associated with a circadian rhythm sleep disorder in a large family. I contributed substantially to the data collection, analysis and preparation of the manuscript.
2001-2003	Mouse Mutagenesis: Phenotypic-Driven Neuroscience Screens (Takahashi)
	NIH/NIMH U01 MH61915
	Pre-doctoral Fellow
	The goal of this center grant was to establish multiple mutagenesis screens of circadian rhythm physiology and behaviors in mice leading to the phenotypic identification and characterization of potential mutants.
2003-2004	Training Program in Sleep, Circadian and Respiratory Neurobiology (Czeisler)
	Institutional training grant, NIH/NHLBI T32 HL07901
	Postdoctoral Fellow
2004-2006	Genetic Analysis of Extreme Circadian/Sleep Phenotypes (Chang)
	Individual National Research Service Award (NRSA), NIH/NHLBI F32 HL078360
	PI
	This fellowship provided the salary and training support to conduct the genetic analysis of individuals exhibiting extreme circadian rhythm and/or sleep phenotypes.
2006-2007	Effects of Vitamin B12 on the Human Circadian Pacemaker (Duffy)
	Individual investigator initiated grant, NIH/NCCAM R21 AT002571
	Postdoctoral Fellow

	The goal of this project was to collect preliminary data examining whether Vitamin B12 supplementation can shorten the period of the human circadian pacemaker. I led the data collection for the majority of participants, contributed to the genetic analysis and co-authored a publication from this work.
2006-2010	Circadian & Genetic Evaluation of Extreme Sleep Timing (Duffy)
	Individual investigator initiated grant, NIH/NHLBI R01 HL080978
	Project Leader, Co-I
	The goal of this project was to conduct careful measurement of circadian period and phase, to assess the circadian pattern of sleep propensity in extreme morning and evening types and related these findings to polymorphisms in candidate "clock" genes. As project leader, I led data collection and analysis, and have submitted the first manuscript from this work.
2007-2010	Project VIVA substudy: Children's Sleep Study (Taveras)
	Investigator initiated grant, Robert Wood Johnson RWJ61544
	Project Leader, Co-I
	The goal of this sub-study was to strengthen the validation of the Project VIVA parental report of child sleep duration and to triangulate on sleep duration, timing, and quality assessments in a population of children using three means: parental reports, daily sleep diaries, and wrist actigraphy. As project leader, I led data collection, analysis and manuscript preparation.
2009-2010	Mechanistic Impact of the Novel *MTNR1B* Type 2 Diabetes Gene on Changes in Circadian, Metabolic and Sleep Physiology (Scheer and Saxena)
	Research, NIH/NCRR Harvard College/HMS Foundation Harvard Catalyst UL RR025758
	Co-I
	The goal of this pilot project was to determine the impact of genetic variants of *MTNR1B* on circadian, metabolic and sleep variables and to help explain the increased risk for the development of diabetes in carriers of a diabetes risk SNP. As Co-I I led the data collection, phenotypic and genetic analysis of in-patient laboratory studies.
2010-2011	Genetic Linkage of Extreme Individual Sleep Durations (Aeschbach)
	Research, William F. Milton Fund
	Project Leader, Co-I
	The goal of this project was to initiate a new interdisciplinary collaboration and collect preliminary genetic and behavioral data in families of phenotypic short and long sleepers, for genetic linkage analysis. I led the data collection, phenotypic and genetic analysis.
2004-2012	Adaptation of Circadian Responses to Light Treatment (Duffy)
	Individual investigator initiated grant, NIH/NHLBI R01 HL077453
	Project Leader, Co-I
	The goal of this study was to investigate the ability of photic history to change the efficacy of light stimuli in modulating circadian regulation, which may reveal a new method to potentiate light therapy in the treatment of circadian rhythm disturbances. As project leader, I led the data collection and analysis, and submitted two manuscripts from this work. I also contributed substantially to the protocol design and writing of the funded competitive renewal grant application.
2010-2012	Impact of *MTNR1B* and *CRY2* Variants on Sleep, Circadian Physiology and Metabolism (Scheer and Saxena)
	Investigator initiated grant, NIH/NIDDK R21 DK089378
	Co-I
	The goal was to determine the impact of genetic variants of *MTNR1B* and *CRY2* on

	circadian, metabolic and sleep variables and to help explain the increased risk for the development of diabetes in carriers of the risk SNP. I led the data collection and phenotypic analysis of in-patient laboratory studies.
2008-2012	Evaluation of Photic Countermeasures for Circadian Entrainment of Neurobehavioral Performance and Sleep-Wake Regulation Before and During Spaceflight (Czeisler)
	Investigator initiated grant, National Space Biomedical Research Institute HFP01601
	Project Leader
	The goal of this project was to test the efficacy of exposure to short-wavelength light at a standard intensity for pre-launch and in-flight phase shifting. I led the collection and analysis of data and contribute to manuscript preparations.
2012-2014	Influence of Circadian Genes on Sleep, Obesity, and Metabolic Phenotypes
	Brigham and Women's Hospital/Harvard Eleanor and Miles Shore Fellowship for Scholars in Medicine Faculty Career Development Award
	PI
	The aim of this proposal was to obtain salary support for protected time to complete data analysis, writing manuscripts, and preparing grant proposals to fund future studies of social-cultural, behavioral, genetic, and environmental context and influences on sleep in children, adolescents, and adults.
2012-2016	Effect of Circadian Gene Variants on Sleep, Obesity, and Metabolic Phenotypes
	Mentored career development grant, NIH/NHLBI K01 HL115458
	PI
	The aim of the proposed research was to examine the influence of circadian genes on sleep behavior, obesity and cardio-metabolic outcome measures across the lifespan. This was determined by investigating associations of candidate circadian gene variants and potential gene-gene interactions with sleep, obesity and metabolic phenotypes in multiple large cohorts. The goal of the overall project was to obtain the necessary mentored training in genetic statistical analysis and advanced epidemiological biostatistics to address the aims of the research study and to develop into an independent investigator in sleep research.
2011-2016	Harvard Transdisciplinary Research in Energetics and Cancer (Hu/Redline subcontract)
	Transdisciplinary multi-center grant, NIH/NCI U54CA155626
	Co-Investigator
	The goals of this study were two-fold. The first goal was to examine associations of sleep duration – a novel risk factor for obesity and metabolic dysfunction identified in the first wave of TREC projects – in infancy and childhood with adiposity and energy balance, and with the emergence of insulin resistance and other cancer-related biomarkers in early adolescence. The second goal was to examine the social-cultural, behavioral, genetic, and environmental context of early childhood sleep patterns that could inform behavioral interventions to improve sleep duration and quality.
2015-2016	Complex Interactions of Behavior, Genes, and Environment in the Multi-system Characterization of the Effects of Sleep Loss on Health, Cardio-metabolic Disease Risk, Cognition, and the Epigenome
	Penn State Clinical and Translational Science Institute (CTSI) Innovative Approaches to Big Data Pilot Project
	PI
	The goal of this project was to pilot a comprehensive characterization of the cardio-metabolic, cognitive, genomic, and epigenetic effects of sleep insufficiency in a controlled laboratory setting. "Big Data" methodologies are employed to handle the complexities of

	mixed methods, a variety of sampled tissues and cognitive testing, varied timescales, and comprehensive whole genome analyses. The transdisciplinary approach leverages expertise from multiple disciplines, departments, and colleges at Penn State's University Park campus, collaborating to investigate how sleep loss contributes to impairments of various biological systems and ultimately leads to increased risk of disease.
2015-2016	Measuring the Effects of Sleep Restriction on the Gut Microbiome in Adults
	College of Health and Human Development/Huck Institute of the Life Sciences, Penn State
	PI
	This study aimed to investigate the effects of sleep restriction on gut microbiota composition and metabolomics profile in humans. We tested the hypotheses that short sleep (5 nights at <5 hours/night) alters the microbiome and that sleep recovery (2 nights at ~10 hours/night) restores (at least partially) the gut microbiota.
2018	Can more sleep lead to improved metabolism in college students?
	Biobehavioral Health Department Seed Fund, Penn State
	PI
	The overall goal of this pilot project was to examine the effects and potential positive impact of a 1-week sleep extension of 1 hour/night behavioral intervention on metabolism in college students.

Current

2013-2018 Biopsychosocial Determinants of Sleep and Wellbeing For Teens in Fragile Families
NIH/NICHD R01 HD073352
Co-Investigator
This study investigates the biopsychosocial and genetic determinants of adolescent sleep, and the extent to which differential sleep patterns and behaviors during childhood contribute to differences in obesity and cardiometabolic risk using the Fragile Families Study (FFS). The FFS is a national birth cohort study of health and development of children, with data collected at birth and ages 1, 3, 5, and 9, and, with recent NIH funding to locate and interview youths and mothers when the adolescents are age 15 (n~3,600). As an ancillary study to the parent FFS age 15 survey, this study aims to study adolescent physical activity and sleep and social/contextual predictors of these behaviors.

Report of Local Teaching and Training

Teaching of Students in Courses

2004	Circadian Biology: Cellular Oscillations to Sleep Regulation Harvard undergraduate and graduate students	Harvard University MCB 186, FAS Discussion section 1 hr/week for 10 wks 3 hr lecture per wk for 10 weeks
2004-2005	The 24-hour Clock: Genetic Regulation of Human Circadian Rhythms and Sleep Undergraduate faculty	Harvard University, Chautauqua Course 1-hour lecture
2013	Sleep, Health and Success: Circadian and Sleep Physiology Harvard undergraduate students	Harvard University SLS-17, FAS 1-hour lecture
2013	Sleep, Health and Success: The Role of Genetics in Circadian Regulation of Sleep Harvard undergraduate students	Harvard University SLS-17, FAS 1-hour lecture

2014 Fa	Sleep, Genes, and Environment Biobehavioral Health graduate students	Pennsylvania State University BBH 502 3-hour lecture
2014 Fa	Sleep and Health Penn State undergraduate students	Pennsylvania State University BBH 311 1.3-hour lecture
2015 Sp	Principles of Epidemiology Penn State 43 undergraduate students	Penn State University BBH/HPA 440 1.3-hour lecture twice/week for 15 weeks
2015 Sp	Sleep Health and Genetics Penn State undergraduate students	Pennsylvania State University BBH 410 1-hour lecture
2015 Sp	Sleep and Health Penn State undergraduate students	Pennsylvania State University BBH 311 1.3-hour lecture
2015 Fa	Sleep, Genes, and Environment Penn State BBH graduate students	Pennsylvania State University BBH 502 3-hour lecture
2015 Fa	Sleep and Health Penn State undergraduate students	Pennsylvania State University BBH 311 1.3-hour lecture
2016 Sp	Genetics and Genomics Workshop CON graduate students (PhD/DNP)	Penn State College of Nursing UP/Hershey Spring Intensive – 5-hour lecture
2016 Sp	Principles of Epidemiology Penn State 80 undergraduate students	Penn State University BBH/HPA 440 1.3-hour lecture twice/week for 15 weeks
2016 Sp	Sleep and Stress Penn State undergraduate students	Pennsylvania State University BBH 432 1-hour lecture
2016 Sp	Sleep Health and Genetics Penn State undergraduate students	Pennsylvania State University BBH 410 1-hour lecture
2016 Fa	Principles of Epidemiology Penn State 180 undergraduate students	Penn State University BBH/HPA 440 1.3-hour lecture twice/week for 15 weeks
2016 Fa	Sleep, Genes, and Environment: The Role of Light and Circadian Gene Variants Penn State BBH graduate students	Pennsylvania State University BBH 502 3-hour lecture
2016 Fa	Sleep and Health: Using a Big Data Approach Penn State CON graduate students	Pennsylvania State University NURS 502 1-hour lecture
2017 Sp	Genetics and Genomics Workshop CON graduate students (PhD/DNP)	Penn State College of Nursing UP/Hershey Spring Intensive – 5-hour lecture
2017 Sp	Principles of Epidemiology Penn State 180 undergraduate students	Penn State University BBH/HPA 440 1.3-hour lecture twice/week for 15 weeks
2017 Sp	Biobehavioral Aspects of Sleep Penn State 35 undergraduate students	Penn State University BBH 497 1.3-hour lecture twice/week for 15 weeks
2017 Sp	The Genetics of Sleep Penn State undergraduate students	Pennsylvania State University BBH 410 1-hour lecture
2017 Fa	Principles of Epidemiology Penn State 180 undergraduate students	Penn State University BBH/HPA 440 1.3-hour lecture twice/week for 15 weeks
2017 Fa	Sleep and Health Penn State undergraduate students	Penn State University NURS FYS 2-hour lecture
2017 Fa	Sleep and Health Penn State undergraduate students	Penn State University BBH 101 1-hour lecture
2018 Sp	Emerging Topics in Genomic and Epigenetic Research Penn State 6 graduate students	Penn State University NURS 590 3-hour lecture once/week for 5 weeks
2018 Sp	Systems Neuroscience	Penn State University NEURO 521

	Penn State 8 graduate students	1.3-hour lecture twice/week for 1 week
2018 Sp	The Genetics of Sleep	Pennsylvania State University BBH 410
	Penn State undergraduate students	1-hour lecture

Formal Teaching of Residents, Clinical Fellows and Research Fellows (post-docs)

2001	Genetics of Sleep and Circadian Rhythms	Northwestern University, Chicago, IL
	Sleep Medicine Residents	One hour lecture

Local Invited Presentations

2000 Genetic Analysis of Familial Advanced Sleep Phase Syndrome/Oral Presentation
Northwestern University Institute for Neuroscience Retreat

2013 Scientists Competing Successfully
Brigham & Women's Hospital Office of Multicultural Careers Roundtable

2013 Influence of Circadian Genes on Sleep, Obesity, and Metabolic Phenotypes
Brigham & Women's Hospital New Faculty Welcome Lunch

2014 Dual Career Couples: How Do They Do It?
Brigham & Women's Hospital Center for Faculty Development and Diversity

2015 Shedding Light on Sleep
Noll Physiological Research Seminar Series, Pennsylvania State University

2016 HHD College Biannual Alumni's Society Board of Directors Meeting, Panel on Sleep

Report of Regional, National and International Invited Teaching and Presentations

Invited Presentations and Courses

Regional, National, and International Invited Presentations and Courses

Regional

2000 Seminar
Loyola University Women in Science

2016 Millenium Café Seminar "Spotlight on Sleep and Health"
Materials Research Institute, Pennsylvania State University

2016 "Sleep and Health"
Penn State College of Nursing Alumni Weekend

2016 "Sleep and Health"
Healthy People Penn State Research Conference and Expo

2018 "Turnitin: Q & A"
Penn State College of Nursing Graduate Seminar

National

2001 Genetic Analysis of a Familial Case of Advanced Sleep Phase Syndrome
Brown University, Providence, RI

2002 Genetic Characterization of Familial Advanced Sleep Phase Syndrome
Society for Research on Biological Rhythms, Amelia Island, FL (abstract)

2007 Sleep Timing and Circadian Rhythms in Extreme Phenotypes
Scripps Clinical Sleep Center Rounds, La Jolla, CA

2008 Adaptation of the Human Circadian System by Prior Light

Annual Meeting of the Associated Professional Sleep Societies, Baltimore, MD (abstract)

2009 The Effect of Diurnal Preference on Subjective Alertness and Performance During Extended Wakefulness
Annual Meeting of the Associated Professional Sleep Societies, Seattle, WA (abstract)

2012 Impact of Light and Technology on Circadian Rhythms and Sleep
Program to Increase Diversity in Behavioral Medicine and Sleep Disorders (PRIDE)
SUNY Downstate Medical Center and New York University, New York, NY

2013 Sleep, Genes, and Environment
Nature & Nurture: Genetic and Environmental Influences on Children's Responses to Adversity, NICHD workshop Rockville, MD

2013 Sleep, Genes, and Environment
Colloquium in the Living Center, Biobehavoral Health Department, Pennsylvania State University, University Park, PA

2013 The Influence of Circadian Genes and the Light Environment on Sleep
Center for Research on Occupational and Environmental Toxicology, Oregon Health Sciences University, Portland, OR

International

2013 Sleep, Genes and Environment: The Role of Circadian Gene Variants and Light
Harvard Medical School Division of Sleep Medicine Sleep Grand Rounds, Boston, MA.

2015 The Role of Light in Sleep, Circadian Rhythms and Alertness. Office Ergonomics Research Committee Marconi Conference, Holland, MI.

2016 Light from Electronic Media and Sleep. Meet the Professor Presentation at the Annual SLEEP meeting, Denver, CO.

2017 Is there an app for that? Leveraging technology for adolescent sleep interventions, Conversation Rountable at Society for Research in Child Development (SRCD) meeting, Austin, TX.

2017 Sleep in the Digital Media Age. Trainee Symposia Series Presentation at the Annual SLEEP meeting, Boston, MA.

2018 Is Electronic Media Making Us Wired and Tired? Trainee Symposia Series Presentation at the Annual SLEEP meeting, Baltimore, MD.

Report of Education of Patients and Service to the Community

2010 Fayerweather Street School, Cambridge, MA
Presentation to 7th and 8th grade students entitled "Sleep, Health and Success: How and why we sleep, when and if it's up to us"

2012 Fayerweather Street School, Cambridge, MA
Presentation to 7th and 8th grade students entitled "Sleep, Health and Success"

2013 Fayerweather Street School, Cambridge, MA
Presentation to 7th and 8th grade students entitled "Sleep, Health and Success"

2014 Fayerweather Street School, Cambridge, MA
Presentation to parents entitled "Sleep, Health and Success: Perspectives for Our Children and Ourselves"

2015 Presentation to 4 9th grade student Health Education classes entitled "Sleep and Health"
State College High School, State College, PA

Report of Scholarship

Peer reviewed publications in print or other media

1. Vitaterna MH, King DP, **Chang A-M**, Kornhauser JM, Lowrey PL, McDonald JD, Dove WF, Pinto LH, Turek FW, Takahashi JS. Mutagenesis and mapping of a mouse gene, Clock, essential for circadian behavior. Science 1994;264(5159):719-25. [PMID: 8171325]
2. King DP, Vitaterna MH, **Chang A-M**, Dove WF, Pinto LH, Turek FW, Takahashi JS. The mouse Clock mutation behaves as an antimorph and maps within the W19H deletion, distal of Kit. Genetics 1997;146(3):1049-60. [PMID: 9215907] PMCID: PMC1208034
3. Antoch MP, Song EJ, **Chang A-M**, Vitaterna MH, Zhao Y, Wilsbacher LD, Sangoram AM, King DP, Pinto LH, Takahashi JS. Functional identification of the mouse circadian Clock gene by transgenic BAC rescue. Cell 1997;89(4):655-67. [PMID: 9160756]
4. Valentinuzzi VS, Buxton OM, **Chang A-M**, Scarbrough K, Ferrari EA, Takahashi JS, Turek FW. Locomotor response to an open field during C57BL/6J active and inactive phases: differences dependent on conditions of illumination. Physiology & Behavior 2000;69(3):269-75. [PMID: 10869592]
5. Reid KJ, **Chang A-M**, Dubocovich ML, Turek FW, Takahashi JS, Zee PC. Familial Advanced Sleep Phase Syndrome. Archives of Neurology 2001;58(7):1089-94. [PMID: 11448298]
6. Vitaterna MH, Ko CH, **Chang A-M**, Buhr ED, Fruechte EM, Schook A, Antoch MP, Turek FW, Takahashi JS. The mouse Clock mutation reduces circadian pacemaker amplitude and enhances efficacy of resetting stimuli and phase response curve amplitude. Proceedings of the National Academy of Sciences USA 2006;103(24):9327-32. [PMID: 16754844] PMCID: PMC1474012
7. Lee JH, Wang W, Silva EJ, **Chang A-M**, Scheuermaier KD, Cain SW, Duffy JF. Neurobehavioral performance in young adults living on a 28-h day for 6 weeks. Sleep 2009;32(7):905-913. [PMCID: PMC2706904]
8. **Chang A-M**, Reid KJ, Gourineni R, Zee PC. Sleep timing and circadian phase in delayed sleep phase syndrome. Journal of Biological Rhythms 2009;24(4):313-321. [PMID: 19625733] PMC3689431
9. **Chang A-M**, Scheer FAJL, Czeisler CA. The human circadian system adapts to prior photic history. Journal of Physiology 2011;589(5):1095-1102. *Selected for Best of Sleep Medicine 2012*. [PMCID: PMC3060589]
10. **Chang A-M**, Buch AM, Bradstreet DS, Klements DJ, Duffy JF. Human diurnal preference and circadian rhythmicity are not associated with the *CLOCK* 3111C/T gene polymorphism. Journal of Biological Rhythms 2011;26(3):276-279. [PMID: 21628555] PMC3689429
11. Cain SW, Silva EJ, **Chang A-M**, Ronda JM, Duffy JF. One night of sleep deprivation affects reaction time, but not interference of facilitation in a stroop task. Brain and Cognition 2011;76:37-42. [PMID: 21477910] PMCID: PMC3310176
12. Duffy JF, Cain SW, **Chang A-M**, Phillips AJK, Munch MY, Gronfier C, Wyatt JK, Dijk D-J, Wright KP, Czeisler CA. Sex difference in intrinsic circadian period in humans. Proc Natl Acad Sci USA 2011;108:15602-8. Epub 2011 May 2. [PMID: 21536890] PMCID: PMC3176605
13. **Chang A-M**, Santhi N, St. Hilaire MA, Gronfier C, Bradstreet DS, Duffy JF, Lockley S, Kronauer RE, Czeisler CA. Human responses to bright light of different durations. Journal of Physiology 2012;590(13):3103-12. Epub 2012 Apr 23. [PMID: 22526883] PMCID: PMC3406393
14. Lim ASP, **Chang A-M**, Shulman JM, Raj T, Chibnik LB, Myers AJ, Buchman AS, Bennett DA, Cain SW, Czeisler CA, Duffy JF, Saper CB, De Jager PL. A common polymorphism near *PER1* and the timing of human behavioral rhythms. Annals of Neurology 2012;72:324-334. [PMID: 23034908] PMCID: PMC3464954
15. **Chang A-M**, Scheer FAJL, Czeisler CA, Aeschbach D. Direct effects of light on alertness, vigilance, and the waking electroencephalogram in humans depend on prior light history. SLEEP 2013;36(8):1239-

46. [PMID: 23904684] PMC3700721
16. Anderson C, **Chang A-M**, Sullivan JP, Ronda JM, Czeisler CA. Assessment of drowsiness based on ocular parameters detected by infrared reflectance oculography. Journal of Clinical Sleep Medicine 2013;9(9):907-20. [PMID: 23997703] PMCID: PMC3746718
17. **Chang A-M**, Aeschbach D, Duffy JF, Czeisler CA. Evening use of light-emitting eReaders negatively affects sleep, circadian timing, and next-morning alertness. Proc Natl Acad Sci USA 2015;112(4):1232-7. Epub 2014 Dec 22. [PMID: 25535358] PMCID: PMC4313820
18. Buxton OM, **Chang A-M**, Spilsbury JC, Bos T, Emselle H, Knutson KL. Sleep in the modern family: protective family routines for child and adolescent sleep. Sleep Health 2015;1(1):15-27. [PMID: 26779564] PMCID: PMC4712736
19. **Chang A-M**, Czeisler CA. Reply to Zeitzer: Good science, in or out of the laboratory, should prevail. Proc Natl Acad Sci USA 2015;112(13):E1514. [PMID: 25762077] PMCID: PMC4386345
20. Lane JM†, **Chang A-M**†, Bjonnes A, Aeschbach D, Cade BE, Cain SW, Czeisler CA, Gottlieb D, Gharib S, Grant S, Klerman EB, Anderson C, Santhi N, Gooley JJ, Lauderdale D, Lockley SW, Munch M, Patel S, Punjabi N, Rajaratnam SMW, Rueger M, St. Hilaire MA, Scheuermaier K, Van Reen E, Zee P, Shea S, Duffy JF, Buxton OM, Redline S, Scheer FAJL†, Saxena R†. Impact of common variation at diabetes trait loci *MTNR1B* and *CRY2* on circadian physiology and sleep. Diabetes. 2016 Jun;65(6):1741-51. [PMID: 26868293] PMCID: PMC4878414
21. **Chang A-M**, Bjonnes A, Aeschbach D, Buxton OM, Gooley JJ, Anderson C, Van Reen E, Cain SW, Czeisler CA, Duffy JF, Lockley SW, Shea SA, Scheer FAJL, Saxena R. Circadian gene variants influence sleep and the sleep encephalogram in humans. Chronobiol Int. 2016;33(5):561-73. Epub 2016 Apr 18. [PMID: 27089043] PMCID: PMC5267557
22. Rahman SA, St. Hilaire M, **Chang A-M**, Santhi N, Duffy JF, Kronauer RE, Czeisler CA, Lockley SW, Klerman EB. Circadian phase resetting by single short-duration light exposure. JCI Insight 2017 Apr 6;2(7). [PMID: 28405608] PMCID: PMC5374060
23. Cain SW, **Chang A-M**, Vlassac I, Tare A, Anderson C, Czeisler CA, Saxena R. Circadian rhythms in plasma Brain-Derived Neurotrophic Factor differ in men and women. J Biol Rhythms 2017 Feb;32(1):75-82. [PMID: 28326910]
24. Grant LK, Cain SW, **Chang A-M**, Saxena R, Czeisler CA, Anderson C. Impaired cognitive flexibility during sleep deprivation among carriers of the Brain Derived Neurotrophic Factor (BDNF) Val66Met allele. Behav Brain Res. 2018 Feb 15;338:51-55 [PMID: 28947280] PMCID: PMC5957758
25. LeBourgeois MK, Hale L, **Chang A-M**, Akacem LD, Montgomery-Downs HE, Buxton OM. Digital media and sleep in childhood and adolescence. Pediatrics. 2017 Nov;140(Suppl 2):S92-S96. [PMID: 29093040] PMCID: PMC5658795
26. Nahmod NG, Lee S, Buxton OM, **Chang A-M**, Hale L. High school start times after 8:30 AM are associated with later wake times and longer time in bed among teens in a national urban cohort study. Sleep Health. Sleep Health 2017 Dec;3(6):444-450 [PMID: 29157638] PMCID: PMC5726563
27. Rahman SA, St. Hilaire M, Gronfier C, **Chang A-M**, Santhi N, Kronauer RE, Czeisler CA, Klerman EB, Lockley SW. Functional decoupling of melatonin suppression and circadian phase resetting in humans. J Physiol 2018 Jun;596(11):2147-2157. [PMID: 29707782] PMCID: PMC5983136
28. Hale L, Kirschen GW, LeBourgeois MK, Gradisar M, Garrison MM, Montgomery-Downs HM, Kirschen H, McHale SM, **Chang A-M**, Buxton OM. Youth screen media habits and sleep: sleep-friendly screen behavior recommendations for clinicians, educators, and parents. Child and Adolescent Psychiatry Clinics. Child Adolesc Psychiatr Clin N Am. 2018 Apr;27(2):229-245. Review. [PMID: 29502749] PMCID: PMC5839336
29. Mathew GMM*, Li X, Hale L, **Chang A-M**. Sleep duration and social jetlag are independently associated with anxious symptoms in adolescents. Chronobiol Int. *In Press.*

Non-peer reviewed scientific or medical publications/materials in print or other media

1. Reid KJ, **Chang A-M**, Zee PC. Circadian rhythm sleep disorders. In: Lee-Chiong TL Jr, guest editor. Medical Clinics of North America: Sleep Disorders. Philadelphia: Saunders; 2004.
2. **Chang A-M**, Zee PC. Human circadian rhythms: genetics of circadian disorders in humans. In: Scuire LR, editor. New Encyclopedia of Neuroscience. Philadelphia: Elsevier; 2008.
3. **Chang A-M**, Zee PC. Genetics of circadian rhythm disorders. In: Pack, AI, guest editor. Sleep Medicine Clinics. Philadelphia: Elsevier Saunders; 2011.
4. Snyder CK and **Chang A-M**. Mobile Technology, Sleep, and Circadian Disruption. In: Grandner M, editor. Sleep Health. Elsevier; *In Press.*

See also:

http://www.ncbi.nlm.nih.gov/sites/myncbi/anne-marie.chang.1/bibliography/48258087/public

Thesis

Chang A-M. Phenotypic characterization and genetic analysis of human circadian rhythm sleep disorders [dissertation]. Evanston (IL): Northwestern University, 2003.

Abstracts, Poster Presentations and Exhibits Presented at Professional Meetings

Chang A-M, Scheer FAJL, Czeisler CA. Adaptation of the human circadian system by prior light history. A0138. Oral presentation at the SLEEP meeting, Baltimore, June 2008.
Chang A-M, Stephens J, Ukaegbu V, Silva EJ, Duffy JF. The effect of diurnal preference on subjective alertness during extended wakefulness. Poster presentation at the Fatigue Management in Transportation Operations International Conference, Boston, March 2009.
Chang A-M, Stephens J, Ukaegbu V, Silva EJ, Duffy JF. Vigilance response of human diurnal types to acute sleep deprivation. Poster presentation at BWH BRI Research Accelerator Program, Boston, May 2009.
Chang A-M, Stephens J, Ukaegbu V, Silva EJ, Duffy JF. The effect of diurnal preference on subjective alertness and performance during extended wakefulness. A0133. Oral presentation at the SLEEP meeting, Seattle, June 2009.
Kearney DW, **Chang A-M**, Dennison CF, Ricker JC, Silva EJ, Duffy JF. Comparison of circadian phase and mid-sleep times in morning and evening types. A0170. SLEEP meeting, Seattle, June 2009.
Veron O, **Chang A-M**, Ronda JM, Kho J, Duffy JF. Sleep architecture in morning and evening types at baseline and following sleep deprivation. A0147. SLEEP meeting, Seattle, June 2009.
Lee JH, Wang W, Silva EJ, **Chang A-M**, Scheuermaier KD, Cain SW, Duffy JF. Neurobehavioral performance in young adults living on a 28-h day for six weeks. A0141. SLEEP meeting, Seattle, June 2009.
Czeisler CA, Anderson C, **Chang A-M,** Cain SW, Ronda JM, Duffy JF. Evaluation of photic countermeasures for circadian entrainment of neurobehavioral performance and sleep-wake regulation before and during spaceflight. NASA Human Research Program Investigator's Workshop, Houston, February 2010.
Chang A-M, Scheer FAJL, Czeisler CA, Aeschbach, D. The magnitude of acute alerting effect of light depends on prior light history. A0078 Poster presentation at the SLEEP meeting, San Antonio, June 2010.
Anderson C, **Chang A-M**, Ronda JM, Czeisler CA. Real-time drowsiness as determined by infra-red

reflectance oculography is commensurate with gold standard laboratory measures: A validation study. A0309. SLEEP meeting, San Antonio, June 2010.
Buch AM, **Chang A-M**, Klements DJ, Duffy JF. Human diurnal preference not associated with *Clock* 3111T/C gene polymorphism. A0208. SLEEP meeting, San Antonio, June 2010.
Chang A-M, Santhi N, Bradstreet DS, Lockley SW, Duffy JF, Kronauer RE, Czeisler CA. Duration response curve to bright light in humans. A0470. Oral presentation at the SLEEP meeting, Minneapolis, June 2011.
Chang A-M, Rondon LA, Taveras E, Buxton OM. Validation of a parental report of child sleep versus direct actigraphic assessment of sleep. A0779. Oral presentation at the SLEEP meeting, Minneapolis, June 2011.
Duffy JF, Cain SW, **Chang A-M**, Phillips AJ, Munch MY, Gronfier C, Wyatt JK, Wright KP, Czeisler CA. Sex difference in intrinsic circadian period in humans. A0897. SLEEP meeting, Minneapolis, June 2011.
Czeisler CA, **Chang A-M,** Anderson C, Cain SW, Ronda JM. Evaluation of photic countermeasures for circadian entrainment of neurobehavioral performance and sleep-wake regulation before and during spaceflight. NASA Human Research Program Investigator's Workshop, Houston, February 2012.
Chang A-M, Anderson C, Cain SW, Czeisler CA. Effect of different light regimens for circadian entrainment to an 8-hour advance of sleep. Oral presentation at the Society for Research of Biological Rhythms (SRBR) meeting, Sandestin FL, May 2012.
Chang A-M, Aeschbach D, Duffy JF, Czeisler CA. Impact of evening use of light-emitting electronic readers on circadian timing and sleep latency. A0606. Oral presentation at the SLEEP meeting, Boston, June 2012.
Chang A-M, Anderson C, Cain SW, Czeisler CA. Evaluation of photic countermeasures for circadian entrainment to an 8-hour advance of sleep. A0628. Poster presentation at the SLEEP meeting, Boston, June 2012.
Chang A-M, Buxton OM, Czeisler CA, Duffy JF, Lockley SW, Scheer FAJL, Saxena R. *PER2* polymorphism influences slow-wave sleep in humans. Oral presentation at the SLEEP meeting, Baltimore, June 2013.
Chang A-M, Taveras EM, Rifas-Shiman SL, Litonjua A, Gillman MW, Saxena R, Redline S. Circadian rhythm gene variants influence body mass index in children. Oral presentation at the SLEEP meeting, Seattle, June 2015.
Stock A, Lee S, Nahmod,N, Buxton OM, **Chang A-M**. Sleep and Cardiometabolic Health: Should College Students Be Concerned? Poster presentation at the SLEEP meeting, Boston, MA, June 2017.
Mathew GM, **Chang A-M**. Chronic Sleep Restriction Impairs Performance in a Line Orientation Task. Poster presentation at the SLEEP meeting, Boston, MA, June 2017.
Ness, K, Ramos AJ, **Chang A-M**, Shearer GC, Buxton OM. Role of Sleep Restriction In Adipocyte Insulin Sensitivity During an Intravenous Glucose Tolerance Test In Healthy Adult Men. Oral and poster presentations at the SLEEP meeting, Boston, MA June 2017.
Li X, Buxton OM, Lee, S, **Chang A-M**, Berger L, Hale L. Sleep mediates the association between adolescent screen time and depressive symptoms. Oral and poster presentations at the SLEEP meeting, Baltimore, MD June 2018.
Mathew GMM*, Buxton OM, Hale L, **Chang A-M**. Social jetlag is associated with greater depressive symptoms among female adolescents. Poster presentations at the SLEEP meeting, Baltimore, MD June 2018.

Narrative Report (limit to 500 words)

My research primarily focuses on the genetic regulation of sleep and circadian rhythm physiology and behavior in humans. More recently, my research interests have expanded to include the investigation of the genetic influence on the complex interaction between sleep, circadian rhythms, and cardio-metabolic function. Current research goals include the physiologic evaluation and genetic analysis of sleep, circadian rhythms, and cardio-metabolic function in humans, particularly in phenotypes of extreme sleep and circadian behaviors with a goal of informing and developing better research criteria for identifying and accurately characterizing these behavioral phenotypes. I am also interested in examining the associations between genetic variants and measures of sleep duration, obesity, and cardio-metabolic function; and to further investigate potential gene-gene interactions and pathways involved in these complex behaviors.

As a clinical research investigator, I have a diverse and unique set of skills in the areas of sleep and circadian physiology, and human genetics. My previous and current training have greatly developed my expertise in conducting intensive inpatient clinical trials and genetic analyses of unique datasets and diverse cohorts spanning the life course. I have developed and sustained collaborations with investigators from both within and outside of my institutions. I have obtained (as PI) and have contributed instrumentally (as co-I) to successful competitions for funding of transdisciplinary research in the areas of human epidemiological/genetic studies of sleep, circadian rhythms, and cardio-metabolic function. I have successfully completed numerous NIH-funded clinical research studies examining the intensive physiological characterization of sleep and circadian phenotypes and have published results.

In addition to clinical investigation, I have informally supervised several students in the laboratory including: a medical student in a research summer program (2005); a high-school student in a summer education program Project Success: Opening the Door to Biomedical Careers for diversity students; 5 undergraduate students, 4 from the University of Surrey, UK participating in a professional training year (2007-2011), and 1 student in a summer research program (2012); and 3 research technicians conducting independent research projects (2009-2010).

My teaching experience includes teaching an epidemiology undergraduate course, and guest lectures on sleep, genetics, and cardio-metabolic function for undergraduate and graduate courses at The Pennsylvania State University; lecturing for undergraduate and graduate students at Harvard University; participation in the NSF Chautauqua courses teaching undergraduate faculty and educators about genetics of sleep and circadian rhythm physiology; and from 2009-2012, serving as a member of the BWH Postdoctoral Leadership Council where I helped develop and host various activities and programs for career development for postdoctoral fellows.

My aim is to develop, 1) a research program applying appropriate genetic techniques to well-characterized physiologic measures of sleep, circadian, and cardio-metabolic function; 2) courses for both the undergraduate and graduate levels in the fields of sleep and circadian physiology, human genetics, and epidemiology; and 3) interdisciplinary training and mentoring opportunities for students, graduates, and postdoctoral fellows focused in the areas of expertise and research interest.