



WILLIAM C. DEMENT
SLEEP AND CHRONOBIOLOGY
BEHAVIORAL SCIENCE
RESEARCH APPRENTICESHIP

Retreat Colloquium

19-21 August 2013

Whispering Pines Conference Center
URI Alton Jones Campus, West Greenwich, RI

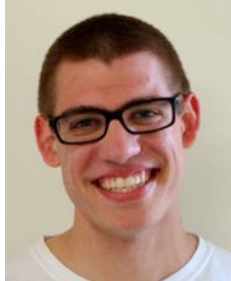
Summer Sleep Retreat, 2013

Monday	Event	Speaker	Topic
1200	Lunch		
1330		Eliza Van Reen, PhD, Young Investigator	Biphasic Effects of Alcohol as a Function of Circadian Phase
1430	Break		
1500		Meiqi "Wendy" He, Dement Fellow	Insomnia and Depression in Children and Adolescents and Treatment Implication fo Depression
1515		Arick Wong, Dement Fellow	The Relationship between Circadian Rhythmicity, Obesity, and Neuroticism
1530		Christina Chu, Dement Fellow	Obstructive Sleep Apnea and Its Increased Risk for Cardiovascular Disease
1545	Break		
1615		Jessaca York, Dement Fellow	Sleep and Academic Life: Considering Implications for Racial Minority Youth

Summer Sleep Retreat, 2013

Monday	Event	Speaker	Topic
1630		Elizabeth Ruggieri, Dement Fellow	The Association between Sleep Duration and BMI in Children and Adolescents
1645		Marissa Lown, Dement Fellow	Risk Factors of Postpartum Depression Related to Sleep
1715	Hors d'oeuvres		
1800	Dinner		
1930		William C. Dement, MD, PhD	An Evening with Dr. Dement-- Reminiscences from 60+ Years of Sleep: Science, Medicine, Politics—just ask...
2100	Camp Fire		
2230	Lights Out		

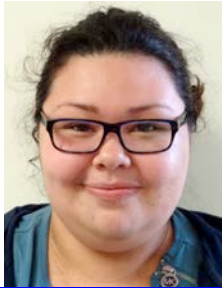
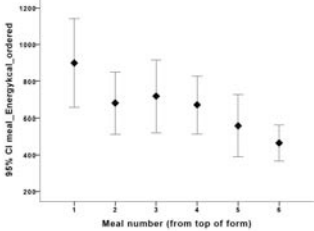
Summer Sleep Retreat, 2013

Tuesday	Event	Speaker	Topic
0900		Jennifer Choi, PhD, Young Investigator	Sleep Deprivation Impairs Protein Synthesis
1000		Robert Daly, MA, Visiting Faculty	Plethysmography-Derived Arousal Scoring: Development of a Computational Method
1030	Break		
1100		Aleksandra Petkova, Dement Fellow	The Use of Spectral Analysis to Study Sleep in Infants and Toddlers: Implications for Developmental Research
1115		Laura Janosko, Dement Fellow	Mechanisms Underlying Declarative Memory Consolidation
1130		Matt Hartmann, Dement Fellow	The Importance of Chronopharmacology
1200	Lunch		

Summer Sleep Retreat, 2013

Tuesday	Event	Speaker	Topic
1330		Brant Hasler, PhD, Young Investigator	Circadian Misalignment, Reward Dysfunction, and Adolescent Substance Involvement
1430	Break		Change into 'Play Clothes'
1445	Walk in the Woods	Assemble in Groups as Instructed	Small Group Conversations about Graduate/Medical School, Careers, etc.
1600	Assemble at Playground	Games!	[Please return from the Walk in the Woods promptly]
1715	Hors d'oeuvres		
1800	Dinner		
1930	Fun Night	Dement Fellows and Others Arrive at 1930	Faculty, Young Investigators, Staff: Assemble in Conference Center at ~ 1915 to Set Up
2115	Camp Fire		
2300	Lights Out		

Summer Sleep Retreat, 2013

Wednesday	Event	Speaker	Topic
0930		Karen Gamble, PhD, Young Investigator	A Time to Sleep and a Time to Eat: Lessons from Hospital Night Shift Workers
1030	Break		
1100		Bianca Demara, Dement Fellow	Melatonin Use as a Sleeping Aid in Children and Adolescents with Autism
1115		Cody Havens, Dement Fellow	Polymorphisms that Impact Cognitive Functioning in Response to Sleep Deprivation and Sleep Restriction
1130		Mary A. Carskadon, PhD	Preliminary Data from this Summer's Research
1145		Program Director	Thanks and Farewell
1200	Lunch		

Summer Sleep Retreat, 2013

Young Investigator Presentations

Eliza Van Reen, PhD, Assistant Professor, Psychiatry & Human Behavior, Alpert Medical School of Brown University, Providence, RI

Biphasic Effects of Alcohol as a Function of Circadian Phase

The most common use of alcohol is in recreational and social settings, where its actions of initial stimulation and mild euphoria are primary. On the other hand, many individuals use alcohol as a sleep aid for its soporific effects. We assessed how alcohol affects multiple sleep latency tests (MSLT) and subjective measures of stimulation/sedation when alcohol is given at different circadian phases using a 20-hour forced desynchrony protocol. Twenty-seven healthy young adults (age 21-26 yr) were studied. Each outcome variable was associated with the ascending or descending limb of the breath alcohol concentration (BrAC) curve and assigned a circadian phase within a 90° bin. The physiologic findings in this study support the biphasic stimulating and sedating properties of alcohol, but limit the effect to specific circadian times.

Jennifer H.K. Choi, PhD, Postdoctoral Fellow, Department of Biology, Department of Medicine, University of Pennsylvania, Philadelphia, PA

Sleep Deprivation Impairs Protein Synthesis

Sleep loss produces deficits in hippocampal synaptic plasticity and hippocampus-dependent memory storage. However, the molecular and cellular mechanisms that underlie these effects of sleep deprivation remain unclear. Several studies have suggested that protein synthesis pathways are altered during sleep and after periods of sleep deprivation. Previous work from our laboratory demonstrated that, in the hippocampus, a prominent effect of sleep loss is the down-regulation of genes associated with protein synthesis. In this set of studies, we observed that five hours of sleep deprivation reduces protein synthesis in the hippocampus when measured by SUnSET, a nonradioactive method to monitor protein synthesis. Consistent with these results, we show that brief sleep deprivation reduced both total and phosphorylated levels of a key regulator of protein synthesis, the mammalian target of rapamycin (mTOR), in the hippocampus. Hippocampal phosphorylated 4E-BP, a translation repressor that is a target of mTOR signaling, is also reduced after brief sleep deprivation. Both mTOR and phosphorylated-4E-BP levels returned to baseline non-sleep deprivation levels after 2.5 hours of recovery sleep post-five hours of sleep deprivation. Together, our findings suggest that the detrimental effects of sleep deprivation are mediated by reduced protein synthesis initiation via down-regulation of mTOR signaling. Because protein synthesis and mTOR activation are required for long-term memory formation, our study sheds light on the underlying molecular mechanisms of the memory impairment induced by sleep deprivation.

Summer Sleep Retreat, 2013

**Brant P. Hasler, PhD, Assistant Professor, Psychiatry Department,
University of Pittsburgh School of Medicine and Co-Director,
Behavioral Sleep Medicine Training Program, University of
Pittsburgh Sleep and Chronobiology Center, Pittsburgh, PA**

Circadian Misalignment, Reward Dysfunction, and Adolescent Substance Involvement

Growing evidence supports circadian regulation of reward-related behavior and physiology. Circadian misalignment, in turn, is associated with problematic outcomes involving reward function, including affective disorders and substance abuse. Adolescents may be particularly prone to effects of circadian misalignment on reward function due to the mismatch between their tendency for delayed circadian phase and early school start times. This talk will discuss recent neuroimaging evidence that circadian misalignment disturbs reward-related brain function in adolescence, increasing the risk for affective and substance use disorders. Talk will close with a brief description of our ongoing K01 study that investigates circadian misalignment and reward dysfunction as a novel pathway to adolescent substance involvement.

**Karen L. Gamble, PhD, Assistant Professor, Behavioral
Neurobiology Division, Department of Psychiatry, University of
Alabama at Birmingham Medical Center**

A time to sleep and a time to eat: lessons from hospital night shift workers

Shift work is associated with an increased risk of developing cancer, mood disorders and cardiovascular, metabolic, gastrointestinal diseases. A potential mechanism for shift-work induced pathology is circadian misalignment, which occurs when sleep/wake/feeding patterns are out of sync with endogenous clock-controlled rhythms and/or the environment. Hospital nurses are an ideal subject sample for shift work because (i) their alertness and performance is crucial for health and safety of patients, and (ii) they often undergo highly irregular schedules due to attempts to follow a normal day schedule on their days-off for family/social reasons. We recently defined off-shift sleep strategies used by hospital nurse shift-workers and found that certain strategies (such as sleep deprivation) were maladaptive, suggesting that future studies should also focus on selection of off-shift behavioral sleep strategies and the resulting circadian misalignment.

Methods and Results: In this presentation, I will present previously preliminary data from a 10-day study in 18 hospital nurses in which we measured misalignment of rhythms in sleep/wake behavior, core body temperature, nutrient intake, melatonin, cortisol, and circadian clock gene expression in peripheral blood mononuclear cells.

Conclusion: The results of these studies will shed light on the potential mechanisms by which off-shift sleep strategies differentially impair adaptation to shift work. Overall, this project will have implications for improving nurses' health through informed recommendations regarding sleep strategies and may lead to work schedule interventions.

Summer Sleep Retreat, 2013

2013 William C. Dement Fellows

Christina Chu

2013 graduate , University of North Texas

Bianca Demara

Rising senior, University of Arizona

Matthew Hartmann

Rising 5th year, James Madison University

Cody Havens

Rising senior, University of Arizona

Meiqi He

Rising senior, Boston University

Laura Janosko

2013 graduate , University of Dayton

Marissa Lown

2013 graduate, College of the Holy Cross

Andrea Montero

Rising 2nd semester senior, Brown University

Aleksandra Petkova

Rising senior, Gettysburg College

Elizabeth Ruggieri

Rising senior, University of Vermont

Arick Wong

Rising senior, Vassar College

Jessaca York

Rising senior, Brown University

Summer Sleep Retreat, 2013

Research Apprenticeship Faculty, Staff, & Trainees

APPRENTICESHIP FACULTY

**Alpert Medical School of Brown University,
Department of Psychiatry and Human
Behavior**

Mary A. Carskadon, PhD, Director

David Barker, PhD

Rachel Herz, PhD

John McGeary, PhD

Ron Seifer, PhD

Leila Tarokh, PhD

Eliza Van Reen, PhD

**Alpert Medical School of Brown University,
Department of Medicine**

Katherine M. Sharkey, MD, PhD

**Valencia College, Department of
Communications**

Kathleen Perri, MA

University of North Texas

Brandy Roane, PhD

**Brown University, Department of
Neuroscience**

Christopher Ciarleglio, PhD

Periodic Breathing Foundation

Robert Daly, MBA

RETREAT VISITING FACULTY

Alpert Medical School of Brown University

Christine Acebo, PhD

Thomas F. Anders, MD

Willoughby Britton, PhD

PSYCHOLOGY INTERNS

Laurin Mack

Hannah Taylor

Lora Wu

SLEEP LAB RESEARCH STAFF, E.P. BRADLEY HOSPITAL

Ashten Bartz, Research PSG Technologist

David Bushnell, Sr. Research Assistant

Sarah Crosky, Research Assistant

Sharon Driscoll, Research Assistant

Max Elliott, Administrative Secretary

Katie Esterline, Research PSG Technologist

Ellyn Ferriter, Sr. Research PSG
Technologist

Maya Gibbes, Data Entry Specialist

Caroline Gredvig-Ardito, Data Manager &
IRB Coordinator

Lauren Hill, Research PSG Technologist

Michelle Loxley, Programmer

PERINATAL SLEEP RESEARCH STAFF, RI HOSPITAL

Julie Quattrucci, Research Assistant

Johanna Thompson-Westra, Research
Assistant

Ijeoma Iko, Brown Medical Student

ACKNOWLEDGEMENTS

The summer research project and academic activities of the apprenticeship were funded by the laboratory restricted research fund and a generous gift from the Periodic Breathing Foundation, Managing Member Robert Daly (Brown University alumnus, BA '73).