



Sleep for Science

Brown University

Bradley Hospital

William C. Dement

**Sleep and Chronobiology
Behavioral Science Research
Apprenticeship**

Retreat Colloquium

18-20 August 2008

**Canonicus Conference Center
Exeter, RI**

Summer Sleep Retreat, 2008

Monday	Event	Speaker	Topic
1200	Lunch		
1330		Tracy L. Rupp, Ph.D. , Young Investigator	Long-term, Complex, and Pervasive Effects of Sleep Restriction on Cognition and Behavior
1430	Break		
1500		Danielle Dunlap	Mama Always Said, "Never go to sleep angry." An Analysis of Emotional Memory and Its Relationship to Sleep and Consolidation
1515		Sara Kaniper	What Came First, the Sleep Disorder or Depression?
1530		Ashley Tessarolo, Supervising Tech	Lucid Dreaming
1545		Anjali Rao	After the Storm: Sleep and the Manifestation of Post- Traumatic Stress Disorder (PTSD)
1600	Break		

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Monday	Event	Speaker	Topic
1630		Clayton Kim	Sleep and Executive Function: Huh? What were you saying?
1645		Marija Bakotic	Insomnia: Cognitive-Behavioral Conceptualization and Treatment
1700		Jared Saletin, Supervising Tech	Ethnic Disparities in Actigraphic and Polysomnographic Sleep in Healthy Self-reported Good Sleepers
1730	Break		
1800	Dinner		
1930		William C. Dement, M.D., Ph.D.	Sleep and Public Health
2100	Camp Fire		
2230	Lights Out		

Summer Sleep Retreat, 2008

Tuesday	Event	Speaker	Topic
0900		Ketema Paul, Ph.D., Young Investigator	Stress and Sleep: Influences of Genetic and Gonadal Sex
1000		Colleen Gribbin	You Think You Know, But You Have No Idea...Living With Bipolar Disorder: An Analysis of the Role of Sleep in Bipolar Disorder
1015		Celso Teixeira	Slow Wave Sleep and Synaptic Strength
1030	Break		
1100		Nischal Nadig	Help, I Have OSA! What's Obesity Got To Do With It?
1115		Moytrayee Guha	What Does REM Sleep Behavior Disorder Tell Us About the Inner Workings of the Brain?

Summer Sleep Retreat, 2008

Tuesday	Event	Speaker	Topic
1130		Katherine M. Sharkey, M.D., Ph.D.	Timing is Everything: Applying Circadian Science to Duty Hour Requirements in Medical Training
1215	Lunch		
1330		Jeffrey Ellenbogen, M.M.Sc., M.D., Young Investigator	Learn While You Wake, Remember While You Sleep
1430	Break		
1500	Walk in the Woods		
1615	Games!		
1800	Dinner		
1930	Fun Night		
2130	Bonfire		
2300	Lights Out		

Summer Sleep Retreat, 2008

Wednesday	Event	Speaker	Topic
0930		Megan Hegenauer, Young Investigator	"It's Just a Phase." What Can the Daily Rhythms of Pubertal Animals Tell Us About Teenage Sleep Patterns?
1030	Break		
1100		Joe Plaksin	Oneiric Behaviors Observed During Human and Animal REM Sleep
1115		Jade Francetich	Everyone's Doing It: Sleep and Associative Learning
1130		Evan Stone	Hypnotic Medications: A Haunting Past, A Hopeful Future
1145		Mary A. Carskadon, Ph.D., Program Director	Farewell
1200	Lunch		

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Young Investigator Presentations

Tracy L. Rupp, Ph.D., National Research Council Postdoctoral Research Associate, Walter Reed Army Institute for Research, Department of Behavioral Biology, Silver Spring, MD

Long-term, Complex, and Pervasive Effects of Sleep Restriction on Cognition and Behavior

In an increasingly 24-hour society, occupational and personal demands often conflict with obtaining adequate sleep. Previous studies of sleep restriction demonstrate individual variability in cognitive performance responses to sleep restriction and in recovery rate. We hypothesized that prior sleep history contributes to this variability and examined the effects of prior sleep on performance and alertness degradation during chronic (7 nights) sleep restriction and subsequent recovery. Data will be presented demonstrating that resilience during sleep restriction and in recovery rate was improved in individuals given prior sleep extension compared to individuals not given prior extended sleep for Psychomotor Vigilance Task (PVT) performance and alertness [measured by the Stanford Sleepiness Scale (SSS) and Maintenance of Wakefulness Test (MWT)]. In addition to prior sleep history, another individual difference factor associated with vulnerability or resilience to sleep loss, personality, will be discussed and data presented linking traits of higher extraversion and neuroticism with greater performance vulnerability. Finally, data on the effects of sleep restriction and recovery on more complex (in comparison to the PVT, SSS, and MWT) behaviors; risk-taking and speech will be presented. Both risk-taking and speech precision measures show degradation with sleep restriction that persist into recovery. Taken together, these data demonstrate the enduring and wide-ranging effects of varying sleep durations on cognitive performance, alertness, and behavior, and provoke questions regarding the physiological mechanisms underlying these effects.

Ketema Paul, Ph.D., Assistant Professor, Department of Anatomy and Neurobiology, Morehouse School of Medicine, Atlanta, GA

Stress and Sleep: Influences of Genetic and Gonadal Sex

The ability of genetic and phenotypic sex to alter sleep responses to stress may contribute to gender differences in the prevalence and severity of sleep-wake disorders. Using mice to examine the influence of reproductive hormones on sleep we have found that: 1) estrogens and androgens are primarily responsible for sex differences in baseline sleep-wake amount but do not have direct influences on homeostatic sleep rebound after extended wakefulness and 2) estrogens and androgens are responsible for sex differences in sleep responses to restraint stress. In order to examine the impact of genetic sex on sleep we have obtained a line of mice whose sex chromosome complement is the opposite of the gonadal sex. Preliminary studies in these mice suggest that genetic sex does not have a substantial influence on baseline sleep-wake

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architecture but does contribute to sex differences in the ability of extended wakefulness to increase slow wave sleep amount. These findings demonstrate that the ability of extended wakefulness and stress to disrupt sleep are sensitive to genetic and gonadal sex and suggest that gender disparities in sleep dysfunction are at least partially biologically driven.

This research was supported by NIH awards #R01-AG-18200 and T32 NS044851 and a fellowship from the UNCF/Merck Science Initiative.

Jeffrey M. Ellenbogen, MMSc, MD, Chief, Division of Sleep Medicine & Director, Sleep Laboratory, Instructor in Neurology, Department of Neurology, Massachusetts General Hospital, Boston, MA

Learn While You Wake, Remember While You Sleep

Memories evolve. After learning something new, the brain initiates a complex set of post-learning processing that strengthens memory (i.e. consolidation). Evidence points to sleep as one of the determinants of that change. Is that possible? And what are the best methods to examine these phenomena. In this talk, I will discuss some of the biological plausibility of sleep leading to boosts in certain kinds of memory, and I will describe some behavioral methods of how to best capture this effect of sleep.

Megan Hagenauer, Candidate, Neuroscience Doctoral Program, University of Michigan, Ann Arbor, MI

"It's Just a Phase." What Can The Daily Rhythms of Pubertal Animals Tell Us About Teenage Sleep Patterns?

One salient characteristic of adolescence is the seemingly unlimited capacity to stay awake late into the evening and sleep late the next morning. This developmental change in the timing of sleep has been observed both cross-sectionally and longitudinally in cultures all over the world. I will argue that this transition represents a physiological change in the phase of the body's internal clock, the circadian timing system. In support of this argument, I will show evidence from four mammalian species that show similar delays in circadian phase around the time of puberty: the rhesus macaque, the laboratory rat, the Octodon degus (degu), and the Psammomys obesus (fat sand rat). Research from these species suggests that the quality of time cues in the external environment (such as lighting intensity or duration) influences the magnitude of phase change during puberty. Research from these laboratory species also elucidates the role of gonadal (sex) hormones in producing pubertal phase delay.

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2008 William C. Dement Fellows

Marija Bakotic

Graduate Student, Institute for Medical Research and Occupational Health, Croatia

Danielle Dunlap

Rising Junior, Brown University

Jade Francetich

Rising Junior, University of Idaho

Colleen Gribbin

Rising Senior, Brown University

Moytraylee Guha

2008 Graduate, Brandeis University

Sara Kaniper

Rising Senior, Beloit College

Clayton Kim

Rising Junior, Brown University

Nischal Nadig

Rising Senior, College of the Holy Cross

Joe Plaksin

Rising Sophomore, University of the Sciences in Philadelphia

Anjali Rao

Rising Junior, Brown University

Evan Stone

Rising Senior, Brown University

Celso Teixeira

Rising Junior, University of Rhode Island

Ashley Tessarolo

2008 Graduate, Indiana Wesleyan University

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2008 Research Apprenticeship Faculty and Lab Staff

APPRENTICESHIP FACULTY

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

Mary A. Carskadon, Ph.D., Director

John McGeary, Ph.D.

Katie Sharkey, M.D., Ph.D.

Ron Seifer, Ph.D.

**Valencia Community College, Department of
Communications**

Kathleen Perri, M.A.

PRE & POSTDOCTORAL TRAINEES

Brown University

Willoughby Britton, Ph.D.

Lavinia Fiorentino, Ph.D.

Erin O'Brien, Ph.D.

Henry Orff

Kristen Stone, Ph.D.

Leila Tarokh, Ph.D.

GRADUATE STUDENT

**Brown University, Department of
Psychology**

Stephanie Crowley

RETREAT VISITING FACULTY

**Brown University, Department of
Psychology**

Rachel Herz, Ph.D.

**Brown University, Human Development
Center**

Monique LeBourgeois, Ph.D.

CONSULTING PHYSICIANS

Keith Callahan, M.D.

Judith Owens, M.D.

E.P. BRADLEY HOSPITAL SLEEP LABORATORY

RESEARCH STAFF

Nate Bowling, Research Technologist

David Bushnell, Research Assistant

Benealia Carter, Research Assistant

Will Coon, Research Technologist

Max Elliott, Administrative Secretary

Denise Maceroni, Assay Technologist

Jen Norton, Research Assistant

Jared Saletin, Research Technologist

Ashley Tessarolo, Research Technologist

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