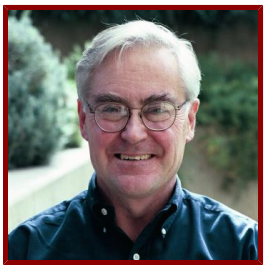
Stanford



H. Craig Heller

Lorry I. Lokey/Business Wire Professor

Biology

CONTACT INFORMATION

- **Alternate Contact**

  Erleen dela Plaza - Administrative Assistant

  Email edelaplaza@stanford.edu

  Tel 650.497.5245

Bio

BIO

Dr. Heller's laboratory currently works in two rather different areas: The roles of sleep and circadian rhythms in learning and memory, and human temperature regulation. The focus in the first area of the lab's work is on the learning disability of Down syndrome. This work has resulted in identification of a class of drugs that restores the ability to learn and remember in mouse models of Down syndrome. One of these compounds has already been in phase 2 clinical studies. This work has led to the discovery of a previously unrecognized function of circadian rhythms that promotes the consolidation of memories during sleep.

The second area of the Heller lab's research is human temperature regulation. Dr. Heller has studied the brain control of body temperature in mammals for many years, much of it focused on hibernation. This work led to the development of a post-anesthesia method to rewarm patients. A resulting discovery was that the primary heat exchange body surfaces of humans are the glabrous skin of the palms, soles, and face. Subsequently the lab developed a technology to rapidly extract heat from the body through one or more of these surfaces. Using such devices, the lab discovered that the major cause of muscle fatigue and failure is rise in temperature of the muscle, and extraction of heat leads to rapid recovery and continued work capacity. Increasing work volume dramatically increases physical conditioning. A commercial version of this technology is now used in athletics. Additional applications include continuous cooling of workers in personal protection gear such as that worn by fire-fighters and hazmat workers. and any other individuals who have to work in the high heat or while being encapsulated for protection from biological or radiological hazards. Other applications include reduction of symptoms in MS patients and going back to our original work, perioperative temperature management of human and veterinary patients.

ACADEMIC APPOINTMENTS

- Professor, Biology
- Member, Bio-X
- Member, Cardiovascular Institute
- Member, Wu Tsai Human Performance Alliance
- Member, Wu Tsai Neurosciences Institute

ADMINISTRATIVE APPOINTMENTS

- Chair, Faculty Senate, (1983-1984)
- Director, Human Biology, (1985-1992)
- Chair, University Committee on Undergraduate Studies, (1987-1988)
- Chair, University Committee on Research, (1992-1994)
- Associate Dean, Dean of Research, (1994-1997)
- Chair, Biological Sciences, (1997-2001)
- Member and past chair, Defense Science Research Council, (2000-2015)
- Chair, Wallenberg Global Learning Network Steering Committee, (2001-2016)
- Director, BSCS, (2018-2024)
- President, Sleep Research Society, (2020-2022)

HONORS AND AWARDS

- Walter J. Gores Award for Excellence in Teaching, University (1977)
- Bing Professor of Human Biology, Human Biology (1987-1993)
- Lorry I. Lokey Business Wire Professor, Biology/Human Biology (1993-present)
- William and Lynde Steere University Fellow, University (2004-present)
- Kenneth M. Cuthertson Award for Exceptional Contributions to Stanford University, University (2010)

PROFESSIONAL EDUCATION

- PhD, Yale University , Biology (1970)

LINKS

- Website: https://dsresearch.stanford.edu

Research & Scholarship

CURRENT RESEARCH AND SCHOLARLY INTERESTS

Neurobiology of sleep, circadian rhythms, regulation of body temperature, mammalian hibernation, and human exercise physiology. We study neural mechanisms controlling arousal states and arousal state transitions, the function of sleep, and the neural mechanisms of circadian rhythms. Research on human exercise physiology focuses on the effects of body temperature on physical conditioning and performance. The focus on Down syndrome is exploring the mechanism whereby reduction of GABA activity restores learning and memory in DS mice and also in mouse models of Alzheimer's disease.

Teaching

COURSES

2026-27

- The Biology of Down Syndrome: When Three's a Crowd: BIO 31N (Win)
- The Neurobiology of Sleep: BIO 149, BIO 249, HUMBIO 161, PSYC 149, PSYC 261 (Spr)

2025-26

- Physiology: BIO 84 (Win)
- The Neurobiology of Sleep: BIO 149, BIO 249, HUMBIO 161, PSYC 149, PSYC 261 (Spr)

2024-25

- The Human Organism: HUMBIO 4A (Spr)
- The Importance of Temperature in Health, Disease, and Performance: BIO 28Q (Aut)
- The Neurobiology of Sleep: BIO 149, BIO 249, HUMBIO 161, PSYC 149, PSYC 261 (Win)

2023-24

- Physiology: BIO 84 (Win)
- The Human Organism: HUMBIO 4A (Spr)
- The Neurobiology of Sleep: BIO 149, BIO 249, HUMBIO 161, PSYC 149, PSYC 261 (Win)

STANFORD ADVISEES

Undergraduate Major Advisor

Jean Chun

GRADUATE AND FELLOWSHIP PROGRAM AFFILIATIONS

- Biology (School of Humanities and Sciences) (PhD Program)
- Neurosciences (PhD Program)

Publications

PUBLICATIONS

- **Automated sleep scoring in hibernating and non-hibernating American black bears.** *PloS one*
  Tøien, Ø., Pittaras, E. C., Huang, Y. G., Brodersen, P. J., Allocca, G., Barnes, B. M., Heller, H. C.
  2026; 21 (8): e0352640

- **Beyond Water, Rest, and Shade: Advancing Farmworker Heat Protection Through Partnership.** *American journal of industrial medicine*
  Elliott, A., Anand, S., Craig Heller, H., Orellana, E., Nieves, M. C., Ley, C., Rath, M. M., Yu, X., Bevill, D., Flores, L., Casa, D., Chicas, R., Hertzberg, et al
  2026

- **Immune Profile of Palmar Cooling on Delayed Onset of Muscle Soreness**
  Tsai, A., Vinh Cao, Anronikov, S., Miyazaki, K., Liu, C., Darracott, C., Einhaus, J., Gaudilliere, D., Gaudilliere, B., Heller, H.
  LIPPINCOTT WILLIAMS & WILKINS.2025: 700-701

- **Selectively Blocking Small Conductance Ca2+-Activated K+ Channels Improves Cognition in Aged Mice.** *Biology*
  Ong, J., Heller, H. C., Pittaras, E.
  2025; 14 (2)

- **Short term GABA antagonist treatment improves long term sleep quality, memory, and decision-making in a Down syndrome mouse model.** *Sleep*
  Pittaras, E. C., Artal, J. M., Ajibola, G., Allocca, G., Bennett, M., Camargo, A., Carpio, A., Gessner, N., Hinton, M., Pizzitola, R., Tan, N., Zhang, E., Zhong, et al
  2024

- **Editorial: Sleep and circadian rhythms in plasticity and memory, volume II.** *Frontiers in systems neuroscience*
  Gerstner, J. R., Heller, H. C., Aton, S. J.
  2024; 18: 1351714

- **Behavioral and Neuronal Characterizations, across Ages, of the TgSwDI Mouse Model of Alzheimer's Disease.** *Genes*
  Tan, N. A., Carpio, A. M., Heller, H. C., Pittaras, E. C.
  2023; 15 (1)

- **The Negative Effects of Travel on Student Athletes Through Sleep and Circadian Disruption.** *Journal of biological rhythms*

Heller, H. C., Herzog, E., Brager, A., Poe, G., Allada, R., Scheer, F., Carskadon, M., de la Iglesia, H. O., Jang, R., Montero, A., Wright, K., Mouraine, P., Walker, et al
2023: 7487304231207330

- **"Count on Sleep": an OSA awareness project update.** *Journal of clinical sleep medicine : JCSM : official publication of the American Academy of Sleep Medicine*
  Martin, J. L., Rowley, J., Goel, N., Heller, H. C., Gurubhagavatula, I., Del Rosso, L., Rodriguez, A., Clark, M., Rice-Conboy, L.
  2023
- **The Thermoregulatory Responses To Palm Cooling During Intermittent And Continuous Exercises In Endurance Athletes**
  Kim, S., Lucernoni, K., Heller, H., Wright, K. P., Byrnes, W. C.
  LIPPINCOTT WILLIAMS & WILKINS.2023: 687
- **The Effect Of Exercise With Or Without Palm Cooling On Napping Behavior In Endurance Athletes**
  Lucernoni, K., Kim, S., Linton, S., Heller, H., Byrnes, W. C., Wright, K. P.
  LIPPINCOTT WILLIAMS & WILKINS.2023: 191
- **Beyond the Symptom: The Biology of Fatigue.** *Sleep*
  Raizen, D. M., Mullington, J., Anaclet, C., Clarke, G., Critchley, H., Dantzer, R., Davis, R., Drew, K. L., Fessel, J., Fuller, P. M., Gibson, E. M., Harrington, M., Lipkin, et al
  2023
- **Reversible Suppression of Fear Memory Recall by Transient Circadian Arrhythmia** *FRONTIERS IN INTEGRATIVE NEUROSCIENCE*
  Steiger, A., Farfan, J., Fisher, N., Heller, H., Fernandez, F., Ruby, N. F.
  2022; 16: 900620
- **Inhibiting USP16 rescues stem cell aging and memory in an Alzheimer's model.** *eLife*
  Reinitz, F., Chen, E. Y., Nicolis di Robilant, B., Chuluun, B., Antony, J., Jones, R. C., Gubbi, N., Lee, K., Ho, W. H., Kolluru, S. S., Qian, D., Adorno, M., Piltti, et al
  2022; 11
- **"Connecting concepts helps put main ideas together": cognitive load and usability in learning biology with an AI-enriched textbook** *INTERNATIONAL JOURNAL OF EDUCATIONAL TECHNOLOGY IN HIGHER EDUCATION*
  Koc-Januchta, M. M., Schonborn, K. J., Roehrig, C., Chaudhri, V. K., Tibell, L. A. E., Heller, H.
  2022; 19 (1)
- **Hyper-rigid phasic organisation of hippocampal activity but normal spatial properties of CA1 place cells in the Ts65Dn mouse model of Down Syndrome.** *The Journal of neuroscience : the official journal of the Society for Neuroscience*
  Munn, R. G., Freeburn, A., Finn, D. P., Heller, H. C.
  1800
- **Aging disrupts circadian gene regulation and function in macrophages.** *Nature immunology*
  Blacher, E., Tsai, C., Litichevskiy, L., Shipony, Z., Iweka, C. A., Schneider, K. M., Chuluun, B., Heller, H. C., Menon, V., Thaiss, C. A., Andreasson, K. I.
  1800
- **Astrocytes are more dynamic players in brain functions than previously recognized.** *Sleep medicine reviews*
  Heller, H. C.
  2021; 59: 101520
- **Disruption of circadian timing increases synaptic inhibition and reduces cholinergic responsiveness in the dentate gyrus.** *Hippocampus*
  McMartin, L., Kiraly, M., Heller, H. C., Madison, D. V., Ruby, N. F.
  2021
- **Question what is "known".** *Neurobiology of sleep and circadian rhythms*
  Heller, H. C.
  2021; 10: 100062
- **Engaging With Biology by Asking Questions: Investigating Students' Interaction and Learning With an Artificial Intelligence-Enriched Textbook** *JOURNAL OF EDUCATIONAL COMPUTING RESEARCH*
  Koc-Januchta, M. M., Schoenborn, K. J., Tibell, L. A. E., Chaudhri, V. K., Heller, H.

2020

- **Loss of Circadian Timing Disrupts Theta Episodes during Object Exploration.** *Clocks & sleep*
  Loewke, A. C., Garrett, A. n., Steiger, A. n., Fisher, N. n., Heller, H. C., Colas, D. n., Ruby, N. F.
  2020; 2 (4): 523–35
- **Suprachiasmatic lesions restore object recognition in down syndrome model mice.** *Neurobiology of sleep and circadian rhythms*
  Chuluun, B. n., Pittaras, E. n., Hong, H. n., Fisher, N. n., Colas, D. n., Ruby, N. F., Heller, H. C.
  2020; 8: 100049
- **The Function(s) of Sleep.** *Handbook of experimental pharmacology*
  Frank, M. G., Heller, H. C.
  2019
- **Functional Interactions Between Sleep and Circadian Rhythms in Learning and Learning Disabilities.** *Handbook of experimental pharmacology*
  Heller, H. C., Ruby, N. F.
  2018
- **A method to reduce heat strain while clad in encapsulating outerwear.** *Journal of occupational and environmental hygiene*
  Grahn, D., Makam, M., Heller, H. C.
  2018: 1–20
- **Scheduled feeding restores memory and modulates c-Fos expression in the suprachiasmatic nucleus and septohippocampal complex.** *Scientific reports*
  Ruby, N. F., Fisher, N., Patton, D. F., Paul, M. J., Fernandez, F., Heller, H. C.
  2017; 7 (1): 6755
- **A Novel Cooling Method and Comparison of Active Rewarming of Mildly Hypothermic Subjects.** *Wilderness & environmental medicine*
  Christensen, M. L., Lipman, G. S., Grahn, D. A., Shea, K. M., Einhorn, J., Heller, H. C.
  2017
- **Development of Circadian Sleep Regulation in the Rat: A Longitudinal Study Under Constant Conditions** *SLEEP*
  Frank, M. G., Ruby, N. F., Heller, H. C., Franken, P.
  2017; 40 (3)
- **Short-term treatment with flumazenil restores long-term object memory in a mouse model of Down syndrome.** *Neurobiology of learning and memory*
  Colas, D., Chuluun, B., Garner, C. C., Heller, H. C.
  2017; 140: 11-16
- **Cyclooxygenase inhibition targets neurons to prevent early behavioural decline in Alzheimer's disease model mice** *BRAIN*
  Woodling, N. S., Colas, D., Wang, Q., Minhas, P., Panchal, M., Liang, X., Mhatre, S. D., Brown, H., Ko, N., Zagol-Ikapitte, I., Van der Hart, M., Khroyan, T. V., Chuluun, et al
  2016; 139: 2063-2081
- **Reentrainment Impairs Spatial Working Memory until Both Activity Onset and Offset Reentrain.** *Journal of biological rhythms*
  Ruby, N. F., Patton, D. F., Bane, S., Looi, D., Heller, H. C.
  2015; 30 (5): 408-416
- **Sleep disruption impairs haematopoietic stem cell transplantation in mice** *NATURE COMMUNICATIONS*
  Rolls, A., Pang, W. W., Ibarra, I., Colas, D., Bonnavion, P., Korin, B., Heller, H. C., Weissman, I. L., de Lecea, L.
  2015; 6
- **A Chemical Heat Pack-Based Method For Consistent Heating of Intravenous Fluids** *WILDERNESS & ENVIRONMENTAL MEDICINE*
  Declerck, M. P., Lipman, G. S., Grahn, D. A., Cao, V., Wieland, M., Troxel, T., Heller, H. C.
  2015; 26 (3): 412-416
- **A Chemical Heat Pack-Based Method For Consistent Heating of Intravenous Fluids.** *Wilderness & environmental medicine*
  DeClerck, M. P., Lipman, G. S., Grahn, D. A., Cao, V., Wieland, M., Troxel, T., Heller, H. C.
  2015; 26 (3): 412-416

- **Loss of Melanopsin Photoreception and Antagonism of the Histamine H3 Receptor by Ciproxifan Inhibit Light-Induced Sleep in Mice** *PLOS ONE*
  Muindi, F., Colas, D., Ikeme, J., Ruby, N. F., Heller, H. C.
  2015; 10 (6)
- **Novel Application of Chemical Cold Packs for Treatment of Exercise-Induced Hyperthermia: A Randomized Controlled Trial** *WILDERNESS & ENVIRONMENTAL MEDICINE*
  Lissoway, J. B., Lipman, G. S., Grahn, D. A., Cao, V. H., Shaheen, M., Phan, S., Weiss, E. A., Heller, H. C.
  2015; 26 (2): 173-179
- **Waking up to the alarm: sleep, clocks, and making memory (s)tick.** *Frontiers in systems neuroscience*
  Gerstner, J. R., Aton, S. J., Heller, H. C.
  2015; 9: 65
- **Nest building is impaired in the Ts65Dn mouse model of Down syndrome and rescued by blocking 5HT2a receptors** *NEUROBIOLOGY OF LEARNING AND MEMORY*
  Heller, H. C., Salehi, A., Chuluun, B., Das, D., Lin, B., Moghadam, S., Garner, C. C., Colas, D.
  2014; 116: 162-171
- **Dysrhythmia in the suprachiasmatic nucleus inhibits memory processing** *SCIENCE*
  Fernandez, F., Lu, D., Ha, P., Costacurta, P., Chavez, R., Heller, H. C., Ruby, N. F.
  2014; 346 (6211): 854-857
- **Circadian rhythm. Dysrhythmia in the suprachiasmatic nucleus inhibits memory processing.** *Science*
  Fernandez, F., Lu, D., Ha, P., Costacurta, P., Chavez, R., Heller, H. C., Ruby, N. F.
  2014; 346 (6211): 854-857
- **Millisecond Flashes of Light Phase Delay the Human Circadian Clock during Sleep** *JOURNAL OF BIOLOGICAL RHYTHMS*
  Zeitzer, J. M., Fisicaro, R. A., Ruby, N. F., Heller, H. C.
  2014; 29 (5): 370-376
- **Millisecond flashes of light phase delay the human circadian clock during sleep.** *Journal of biological rhythms*
  Zeitzer, J. M., Fisicaro, R. A., Ruby, N. F., Heller, H. C.
  2014; 29 (5): 370-376
- **Adaptive and Pathological Inhibition of Neuroplasticity Associated With Circadian Rhythms and Sleep** *BEHAVIORAL NEUROSCIENCE*
  Heller, H. C., Ruby, N. F., Rolls, A., Makam, M., Colas, D.
  2014; 128 (3): 273-282
- **Retino-hypothalamic regulation of light-induced murine sleep.** *Frontiers in systems neuroscience*
  Muindi, F., Zeitzer, J. M., Heller, H. C.
  2014; 8: 135-?
- **Sleep to forget: interference of fear memories during sleep.** *Molecular psychiatry*
  Rolls, A., Makam, M., Kroeger, D., Colas, D., De Lecea, L., Heller, H. C.
  2013; 18 (11): 1166-1170
- **Spatial Memory and Long-Term Object Recognition Are Impaired by Circadian Arrhythmia and Restored by the GABA(A)Antagonist Pentylenetetrazole** *PLOS ONE*
  Ruby, N. F., Fernandez, F., Garrett, A., Klima, J., Zhang, P., Sapolsky, R., Heller, H. C.
  2013; 8 (8)
- **Short-term treatment with the GABAA receptor antagonist pentylenetetrazole produces a sustained pro-cognitive benefit in a mouse model of Down's syndrome.** *British journal of pharmacology*
  Colas, D., Chuluun, B., Warrier, D., Blank, M., Wetmore, D. Z., Buckmaster, P., Garner, C. C., Heller, H. C.
  2013; 169 (5): 963-973
- **Permanent Genetic Access to Transiently Active Neurons via TRAP: Targeted Recombination in Active Populations.** *Neuron*
  Guenthner, C. J., Miyamichi, K., Yang, H. H., Heller, H. C., Luo, L.
  2013; 78 (5): 773-784

- **The acute effects of light on murine sleep during the dark phase: importance of melanopsin for maintenance of light-induced sleep.** *European journal of neuroscience*
  Muindi, F., Zeitzer, J. M., Colas, D., Heller, H. C.
  2013; 37 (11): 1727-1736
- **WORK VOLUME AND STRENGTH TRAINING RESPONSES TO RESISTIVE EXERCISE IMPROVE WITH PERIODIC HEAT EXTRACTION FROM THE PALM** *JOURNAL OF STRENGTH AND CONDITIONING RESEARCH*
  Grahn, D. A., Cao, V. H., Nguyen, C. M., Liu, M. T., Heller, H. C.
  2012; 26 (9): 2558-2569
- **Enhancing Thermal Exchange in Humans and Practical Applications** *Disruptive Science and Technology*
  H. Craig Heller, Dennis A. Grahn
  2012; 1 (1): 11 - 19
- **Pumilio-2 Function in the Mouse Nervous System** *PLOS ONE*
  Siemen, H., Colas, D., Heller, H. C., Bruestle, O., Pera, R. A.
  2011; 6 (10)
- **Optogenetic disruption of sleep continuity impairs memory consolidation** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
  Rolls, A., Colas, D., Adamantidis, A., Carter, M., Lanre-Amos, T., Heller, H. C., de Lecea, L.
  2011; 108 (32): 13305-13310
- **Response of the Human Circadian System to Millisecond Flashes of Light** *PLOS ONE*
  Zeitzer, J. M., Ruby, N. F., Fisicaro, R. A., Heller, H. C.
  2011; 6 (7)
- **Repeatability Is Not the Same as Accuracy** *SLEEP*
  Heller, H. C.
  2011; 34 (7): 839-840
- **Palm cooling between sets of resistive training improves work capacity and strength training responses** *Experimental Biology Meeting 2011*
  Grahn, D. A., Cao, V. H., Nguyen, C. M., Liu, M. T., Heller, H. C.
  FEDERATION AMER SOC EXP BIOL.2011
- **Hibernation in Black Bears: Independence of Metabolic Suppression from Body Temperature** *SCIENCE*
  Toien, O., Blake, J., Edgar, D. M., Grahn, D. A., Heller, H. C., Barnes, B. M.
  2011; 331 (6019): 906-909
- **Acute Light Exposure Suppresses Circadian Rhythms in Clock Gene Expression** *JOURNAL OF BIOLOGICAL RHYTHMS*
  Grone, B. P., Chang, D., Bourgin, P., Cao, V., Fernald, R. D., Heller, H. C., Ruby, N. F.
  2011; 26 (1): 78-81
- **Separating the Contribution of Glucocorticoids and Wakefulness to the Molecular and Electrophysiological Correlates of Sleep Homeostasis** *SLEEP*
  Mongrain, V., Hernandez, S. A., Pradervand, S., Dorsaz, S., Curie, T., Hagiwara, G., Gip, P., Heller, H. C., Franken, P.
  2010; 33 (9): 1147-1157
- **Circadian Locomotor Rhythms Are Normal in Ts65Dn "Down Syndrome" Mice and Unaffected by Pentylenetetrazole** *JOURNAL OF BIOLOGICAL RHYTHMS*
  Ruby, N. F., Fernandez, F., Zhang, P., Klima, J., Heller, H. C., Garner, C. C.
  2010; 25 (1): 63-66
- **Heat Loss Through the Glabrous Skin Surfaces of Heavily Insulated, Heat-Stressed Individuals** *ASME Summer Bioengineering Conference*
  Grahn, D. A., Dillon, J. L., Heller, H. C.
  ASME-AMER SOC MECHANICAL ENG.2009
- **New neurons in the adult brain: The role of sleep and consequences of sleep loss** *SLEEP MEDICINE REVIEWS*
  Meerlo, P., Mistiberger, R. E., Jacobs, B. L., Heller, H. C., McGinty, D.
  2009; 13 (3): 187-194

- **Melanopsin as a Sleep Modulator: Circadian Gating of the Direct Effects of Light on Sleep and Altered Sleep Homeostasis in Opn4(-/-) Mice** *PLOS BIOLOGY*
  Tsai, J. W., Hannibal, J., Hagiwara, G., Colas, D., Ruppert, E., Ruby, N. F., Heller, H. C., Franken, P., Bourgin, P.
  2009; 7 (6)
- **Long term repair of learning disability through short-term reduction of CNS inhibition.** *Augmented Cognition, HCII 2009. D.D. Schmorrow et al. (Eds.)*
  Heller, H.C., Colas, D., Ruby, N.F., Fernandez, F., Chuluun, B., Blank, M., Garner, C.C.
  2009: 818-825
- **No Rescue of the Impaired Homeostasic Sleep Rebound in DBA/2J Mice with Attentuation of the Stress Response**
  Mongrain, V., Curie, T., Gip, P., Heller, H. C., Franken, P.
  KARGER.2009: 247–47
- **Long Term Repair of Learning Disability through Short-Term Reduction of CNS Inhibition** *5th International Conference on Foundation of Augmented Cognition*
  Heller, H. C., Colas, D., Ruby, N. F., Fernandez, F., Chuluun, B., Blank, M., Garner, C. C.
  SPRINGER-VERLAG BERLIN.2009: 818–825
- **VACUUM ENHANCED HEAT TRANSFER THROUGH MAMMALIAN RADIATOR STRUCTURES** *ASME Summer Bioengineering Conference*
  Grahn, D. A., Hall, C. L., Heller, H. C.
  AMER SOC MECHANICAL ENGINEERS.2009: 745–746
- **Hippocampal-dependent learning requires a functional circadian system** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
  Ruby, N. F., Hwang, C. E., Wessells, C., Fernandez, F., Zhang, P., Sapolsky, R., Heller, H. C.
  2008; 105 (40): 15593-15598
- **Cooling via one hand improves physical performance in heat-sensitive individuals with Multiple Sclerosis: A preliminary study** *BMC NEUROLOGY*
  Grahn, D. A., Murray, J. v., Heller, H. C.
  2008; 8
- **A non-circadian role for clock-genes in sleep homeostasis: a strain comparison** *BMC NEUROSCIENCE*
  Franken, P., Thomason, R., Heller, H. C., O'Hara, B. F.
  2007; 8
- **Pattern recognition of sleep in rodents using piezoelectric signals generated by gross body movements** *IEEE TRANSACTIONS ON BIOMEDICAL ENGINEERING*
  Flores, A. E., Flores, J. E., Deshpande, H., Picazo, J. A., Xie, X. (., Franken, P., Heller, H. C., Grahn, D. A., O'Hara, B. F.
  2007; 54 (2): 225-233
- **Synaptic protein dynamics in hibernation** *JOURNAL OF NEUROSCIENCE*
  von der Ohe, C. G., Garner, C. C., Darian-Smith, C., Heller, H. C.
  2007; 27 (1): 84-92
- **H. Craig Heller. Interviewed by Laura L. Mays Hoopes.** *CBE life sciences education*
  Heller, H. C.
  2007; 6 (4): 275-276
- **A global rather than local role for adenosine in sleep homeostasis** *SLEEP*
  Heller, H. C.
  2006; 29 (11): 1382-1383
- **Ubiquitous and temperature-dependent neural plasticity in hibernators** *JOURNAL OF NEUROSCIENCE*
  von der Ohe, C. G., Darian-Smith, C., Garner, C. C., Heller, H. C.
  2006; 26 (41): 10590-10598
- **Glycogen content in the cerebral cortex increases with sleep loss in C57BL/6J mice** *NEUROSCIENCE LETTERS*
  Franken, P., Gip, P., Hagiwara, G., Ruby, N. F., Heller, H. C.

2006; 402 (1-2): 176-179

- **Sleep restriction suppresses neurogenesis induced by hippocampus-dependent learning** *JOURNAL OF NEUROPHYSIOLOGY*
  Hairston, I. S., Little, M. T., Scanlon, M. D., Barakat, M. T., Palmer, T. D., Sapolsky, R. M., Heller, H. C.
  2005; 94 (6): 4224-4233

- **Neural plasticity in hibernation** *Annual Meeting of the Society-for-Integrative-and-Comparative-Biology*
  Von Der Ohe, C. G., Darian-Smith, C., Heller, H. C.
  OXFORD UNIV PRESS INC.2005: 1090–90

- **Light induces c-fos and per1 expression in the suprachiasmatic nucleus of arrhythmic hamsters** *AMERICAN JOURNAL OF PHYSIOLOGY-REGULATORY INTEGRATIVE AND COMPARATIVE PHYSIOLOGY*
  Barakat, M. T., O'Hara, B. F., Cao, V. H., Heller, H. C., Ruby, N. F.
  2005; 289 (5): R1381-R1386

- **Heat extraction through the palm of one hand improves aerobic exercise endurance in a hot environment** *JOURNAL OF APPLIED PHYSIOLOGY*
  Grahn, D. A., Cao, V. H., Heller, H. C.
  2005; 99 (3): 972-978

- **Lack of the alanine-serine-cysteine transporter 1 causes tremors, seizures, and early postnatal death in mice** *BRAIN RESEARCH*
  Xie, X. M., Dumas, T., Tang, L., Brennan, T., Reeder, T., Thomas, W., Klein, R. D., Flores, J., O'Hara, B. F., Heller, H. C., Franken, P.
  2005; 1052 (2): 212-221

- **Unresolved issues in sleep ontogeny: a response to Blumberg et al.** *JOURNAL OF SLEEP RESEARCH*
  Frank, M. G., Heller, H. C.
  2005; 14 (1): 98-101

- **Phenotypic differences in reentrainment behavior and sensitivity to nighttime light pulses in Siberian hamsters** *JOURNAL OF BIOLOGICAL RHYTHMS*
  Ruby, N. F., Barakat, M. T., Heller, H. C.
  2004; 19 (6): 530-541

- **Light pulses do not induce c-fos or per1 in the SCN of hamsters that fail to reentrain to the photocycle** *JOURNAL OF BIOLOGICAL RHYTHMS*
  Barakat, M. I., O'Hara, B. E., Cao, V. H., Larkin, J. E., Heller, H. C., Ruby, N. F.
  2004; 19 (4): 287-297

- **Homeostatic regulation of sleep in arrhythmic Siberian hamsters** *AMERICAN JOURNAL OF PHYSIOLOGY-REGULATORY INTEGRATIVE AND COMPARATIVE PHYSIOLOGY*
  Larkin, J. E., Yokogawa, T., Heller, H. C., Franken, P., Ruby, N. F.
  2004; 287 (1): R104-R111

- **Glucocorticoids influence brain glycogen levels during sleep deprivation** *AMERICAN JOURNAL OF PHYSIOLOGY-REGULATORY INTEGRATIVE AND COMPARATIVE PHYSIOLOGY*
  Gip, P., Hagiwara, G., Sapolsky, R. M., Cao, V. H., Heller, H. C., Ruby, N. F.
  2004; 286 (6): R1057-R1062

- **Sleep deprivation effects on growth factor expression in neonatal rats: A potential role for BDNF in the mediation of delta power** *JOURNAL OF NEUROPHYSIOLOGY*
  Hairston, I. S., Peyron, C., Denning, D. P., Ruby, N. F., Flores, J., Sapolsky, R. M., Heller, H. C., O'Hara, B. F.
  2004; 91 (4): 1586-1595

- **Sleep and circadian rhythms in mammalian torpor** *ANNUAL REVIEW OF PHYSIOLOGY*
  Heller, H. C., Ruby, N. F.
  2004; 66: 275-289

- **Stress response to sleep deprivation varies with genotype: Implications for sleep regulation** *18th Annual Meeting of the Associated-Professional-Sleep-Societies*
  Franken, P., Gip, P. T., Hagiwara, G., Heller, H.
  AMER ACAD SLEEP MEDICINE.2004: 168–168

- **Changes in brain glycogen after sleep deprivation vary with genotype** *AMERICAN JOURNAL OF PHYSIOLOGY-REGULATORY INTEGRATIVE AND COMPARATIVE PHYSIOLOGY*
  Franken, P., Gip, P., Hagiwara, G., Ruby, N. F., Heller, H. C.
  2003; 285 (2): R413-R419

- **Glucocorticoids mediate the effects of sleep deprivation on brain glycogen and glucose levels** *17th Annual Meeting of the Associated-Professional-Sleep-Societies*
  Ruby, N. F., Gip, P., Hagiwara, G., Sapolsky, R., Cao, V., Franken, P., Heller, H. C.
  AMER ACAD SLEEP MEDICINE.2003: A14–A15

- **Clock-related gene expression in non-SCN brain regions following sleep deprivation in wildtype and cryptochrome knockout mice: Relevance to sleep homeostasis** *17th Annual Meeting of the Associated-Professional-Sleep-Societies*
  O'Hara, B. F., Terao, A., Cao, V., Gip, P., Wisor, J. P., Heller, H. C., Franken, P., Kilduff, T. S.
  AMER ACAD SLEEP MEDICINE.2003: A419–A419

- **The ontogeny of mammalian sleep: a reappraisal of alternative hypotheses** *JOURNAL OF SLEEP RESEARCH*
  Frank, M. G., Heller, H. C.
  2003; 12 (1): 25-34

- **Region-specific expression in recovery sleep changes in immediate early gene response to sleep deprivation and in the mouse brain** *NEUROSCIENCE*
  Terao, A., Greco, M. A., Davis, R. W., Heller, H. C., Kilduff, T. S.
  2003; 120 (4): 1115-1124

- **Differential increase in the expression of heat shock protein family members during sleep deprivation and during sleep** *NEUROSCIENCE*
  Terao, A., Steininger, T. L., Hyder, K., Apte-Deshpande, A., Ding, J., Rishipathak, D., Davis, R. W., Heller, H. C., Kilduff, T. S.
  2003; 116 (1): 187-200

- **Role of melanopsin in circadian responses to light** *SCIENCE*
  Ruby, N. F., Brennan, T. J., Xie, X. M., Cao, V., Franken, P., Heller, H. C., O'Hara, B. F.
  2002; 298 (5601): 2211-2213

- **Constant darkness restores entrainment to phase-delayed Siberian hamsters** *AMERICAN JOURNAL OF PHYSIOLOGY-REGULATORY INTEGRATIVE AND COMPARATIVE PHYSIOLOGY*
  Ruby, N. F., Joshi, N., Heller, H. C.
  2002; 283 (6): R1314-R1320

- **Sleep deprivation decreases glycogen in the cerebellum but not in the cortex of young rats** *AMERICAN JOURNAL OF PHYSIOLOGY-REGULATORY INTEGRATIVE AND COMPARATIVE PHYSIOLOGY*
  Gip, P., Hagiwara, G., Ruby, N. F., Heller, H. C.
  2002; 283 (1): R54-R59

- **Loss of circadian organization of sleep and wakefulness during hibernation** *AMERICAN JOURNAL OF PHYSIOLOGY-REGULATORY INTEGRATIVE AND COMPARATIVE PHYSIOLOGY*
  Larkin, J. E., Franken, P., Heller, H. C.
  2002; 282 (4): R1086-R1095

- **The suprachiasmatic nucleus is essential for circadian body temperature rhythms in hibernating ground squirrels** *JOURNAL OF NEUROSCIENCE*
  Ruby, N. F., Dark, J., Burns, D. E., Heller, H. C., Zucker, I.
  2002; 22 (1): 357-364

- **Sleep deprivation elevates plasma corticosterone levels in neonatal rats** *NEUROSCIENCE LETTERS*
  Hairston, I. S., Ruby, N. F., Brooke, S., Peyron, C., Denning, D. P., Heller, H. C., Sapolsky, R. M.
  2001; 315 (1-2): 29-32

- **Gene expression profiling of the response to sleep deprivation in mouse and rat cortex using affymetrix DNA chips**
  Terao, A., Peyron, C., Apte-Deshpande, A., Brown, B., Wurts, S. W., Edgar, D. M., Davis, R. W., Heller, H. C., Kilduff, T. S.
  AMER ACAD SLEEP MEDICINE.2001: A138–A138

- **Prenatal nicotine alters vigilance states and AchR gene expression in the neonatal rat: implications for SIDS** *AMERICAN JOURNAL OF PHYSIOLOGY-REGULATORY INTEGRATIVE AND COMPARATIVE PHYSIOLOGY*
  Frank, M. G., Srere, H., Ledezma, C., O'Hara, B., Heller, H. C.
  2001; 280 (4): R1134-R1140
- **Prepro-hypocretin (prepro-orexin) expression is unaffected by short-term sleep deprivation in rats and mice** *SLEEP*
  Terao, A., Peyron, C., Ding, J., Wurts, S. W., Edgar, D. M., Heller, H. C., Kilduff, T. S.
  2000; 23 (7): 867-874
- **How sleep develops in babies** *RECHERCHE*
  Heller, H. C., Peyron, C., Frank, M.
  2000: 14-17
- **Siberian hamsters that fail to reentrain to the photocycle have suppressed melatonin levels** *AMERICAN JOURNAL OF PHYSIOLOGY-REGULATORY INTEGRATIVE AND COMPARATIVE PHYSIOLOGY*
  Ruby, N. F., Dubocovich, M. L., Heller, H. C.
  2000; 278 (3): R757-R762
- **Implications of sleep deprivation experiments for our understanding of sleep homeostasis** *SLEEP*
  Benington, J. H., Heller, H. C.
  1999; 22 (8): 1033-1037
- **Circadian rhythms in the suprachiasmatic nucleus are temperature-compensated and phase-shifted by heat pulses in vitro** *6th Meeting of the Society-for-Research-on-Biological-Rhythms*
  Ruby, N. F., Burns, D. E., Heller, H. C.
  SOC NEUROSCIENCE.1999: 8630–36
- **HSP70 expression is increased during the day in a diurnal animal, the golden-mantled ground squirrel Spermophilus lateralis** *MOLECULAR AND CELLULAR BIOCHEMISTRY*
  Bitting, L., Watson, F. L., O'Hara, B. F., Kilduff, T. S., Heller, H. C.
  1999; 199 (1-2): 25-34
- **8-OH-DPAT-sensitive neurons in the nucleus raphe magnus modulate thermoregulatory output in rats** *BRAIN RESEARCH*
  Berner, N. J., Grahn, D. A., Heller, H. C.
  1999; 831 (1-2): 155-164
- **Gene expression in the brain across the hibernation cycle** *JOURNAL OF NEUROSCIENCE*
  O'Hara, B. F., Watson, F. L., Srere, H. K., Kumar, H., Wiler, S. W., Welch, S. K., Bitting, L., Heller, H. C., Kilduff, T. S.
  1999; 19 (10): 3781-3790
- **Developmental changes in nicotinic receptor mRNAs and responses to nicotine in the suprachiasmatic nucleus and other brain regions** *MOLECULAR BRAIN RESEARCH*
  O'Hara, B. F., MacDonald, E., Clegg, D., Wiler, S. W., Andretic, R., Cao, V. H., Miller, J. D., Heller, H. C., Kilduff, T. S.
  1999; 66 (1-2): 71-82
- **The glutamate induced phase shift in the SCN slice: a two pulse study** *BRAIN RESEARCH*
  Franken, P., Cao, V., Heller, H. C., Miller, J. D.
  1999; 818 (1): 34-40
- **Sleep after arousal from hibernation is not homeostatically regulated** *AMERICAN JOURNAL OF PHYSIOLOGY-REGULATORY INTEGRATIVE AND COMPARATIVE PHYSIOLOGY*
  Larkin, J. E., Heller, H. C.
  1999; 276 (2): R522-R529
- **Phase shift magnitude and direction determine whether Siberian hamsters reentrain to the photocycle** *JOURNAL OF BIOLOGICAL RHYTHMS*
  Ruby, N. F., Joshi, N., Heller, H. C.
  1998; 13 (6): 506-517
- **Neurons containing hypocretin (orexin) project to multiple neuronal systems** *JOURNAL OF NEUROSCIENCE*
  Peyron, C., Tighe, D. K., Van den Pol, A. N., De Lecea, L., Heller, H. C., Sutcliffe, J. G., Kilduff, T. S.

1998; 18 (23): 9996-10015

- **Recovery from mild hypothermia can be accelerated by mechanically distending blood vessels in the hand** *JOURNAL OF APPLIED PHYSIOLOGY*
  Grahn, D., Brock-Utne, J. G., Watenpaugh, D. E., Heller, H. C.
  1998; 85 (5): 1643-1648

- **Early synaptogenesis in vitro: Role of axon target distance** *JOURNAL OF COMPARATIVE NEUROLOGY*
  van den Pol, A. N., Obrietan, K., Belousov, A. B., Yang, Y., Heller, H. C.
  1998; 399 (4): 541-560

- **Characterization of the circadian system of NGFI-A and NGFI-A/NGFI-B deficient mice** *6th Meeting of the Society-for-Research-on-Biological-Rhythms*
  Kilduff, T. S., Vugrinic, C., Lee, S. L., Milbrandt, J. D., Mikkelsen, J. D., O'Hara, B. F., Heller, H. C.
  SAGE PUBLICATIONS INC.1998: 347–57

- **Circadian system of mice integrates brief light stimuli** *AMERICAN JOURNAL OF PHYSIOLOGY-REGULATORY INTEGRATIVE AND COMPARATIVE PHYSIOLOGY*
  Van den Pol, A. N., Cao, V., HELLER, H. G.
  1998; 275 (2): R654-R657

- **Effects of sleep deprivation in neonatal rats** *AMERICAN JOURNAL OF PHYSIOLOGY-REGULATORY INTEGRATIVE AND COMPARATIVE PHYSIOLOGY*
  Frank, M. G., Morrissette, R., Heller, H. C.
  1998; 275 (1): R148-R157

- **Effects of temperature on sleep in the developing rat** *AMERICAN JOURNAL OF PHYSIOLOGY-REGULATORY INTEGRATIVE AND COMPARATIVE PHYSIOLOGY*
  Morrissette, R. N., Heller, H. C.
  1998; 274 (4): R1087-R1093

- **Nicotine and nicotinic receptors in the circadian system** *6th Nicotine Round Table Satellite Meeting*
  O'Hara, B. F., Edgar, D. M., Cao, V. H., Wiler, S. W., Heller, H. C., Kilduff, T. S., Miller, J. D.
  PERGAMON-ELSEVIER SCIENCE LTD.1998: 161–73

- **Suprachiasmatic nucleus: role in circannual body mass and hibernation rhythms of ground squirrels** *25th Annual Meeting of the Society-for-Neuroscience*
  Ruby, N. F., Dark, J., Heller, H. C., Zucker, I.
  ELSEVIER SCIENCE BV.1998: 63–72

- **Does the preoptic anterior hypothalamus receive thermoafferent information?** *AMERICAN JOURNAL OF PHYSIOLOGY-REGULATORY INTEGRATIVE AND COMPARATIVE PHYSIOLOGY*
  Berner, N. J., Heller, H. C.
  1998; 274 (1): R9-R18

- **The aged suprachiasmatic nucleus is phase-shifted by cAMP in vitro** *BRAIN RESEARCH*
  Ruby, N. F., Edgar, D. M., Heller, H. C., Miller, J. D.
  1998; 779 (1-2): 338-341

- **The effects of REM sleep-inhibiting drugs in neonatal rats: evidence for a distinction between neonatal active sleep and REM sleep** *BRAIN RESEARCH*
  Frank, M. G., Page, J., Heller, H. C.
  1997; 778 (1): 64-72

- **Melatonin attenuates photic disruption of circadian rhythms in Siberian hamsters** *AMERICAN JOURNAL OF PHYSIOLOGY-REGULATORY INTEGRATIVE AND COMPARATIVE PHYSIOLOGY*
  Ruby, N. F., Kang, T., Heller, H. C.
  1997; 273 (4): R1540-R1549

- **Neonatal treatments with the serotonin uptake inhibitors clomipramine and zimelidine, but not the noradrenaline uptake inhibitor desipramine, disrupt sleep patterns in adult rats** *BRAIN RESEARCH*
  Frank, M. G., Heller, H. C.

1997; 768 (1-2): 287-293

- **Development of diurnal organization of EEG slow-wave activity and slow-wave sleep in the rat** *AMERICAN JOURNAL OF PHYSIOLOGY-REGULATORY INTEGRATIVE AND COMPARATIVE PHYSIOLOGY*
  Frank, M. G., Heller, H. C.
  1997; 273 (2): R472-R478

- **Daily variation of CNS gene expression in nocturnal vs. diurnal rodents and in the developing rat brain** *MOLECULAR BRAIN RESEARCH*
  OHARA, B. F., Watson, F. L., Andretic, R., Wiler, S. W., Young, K. A., Bitting, L., Heller, H. C., Kilduff, T. S.
  1997; 48 (1): 73-86

- **Development of REM and slow wave sleep in the rat** *AMERICAN JOURNAL OF PHYSIOLOGY-REGULATORY INTEGRATIVE AND COMPARATIVE PHYSIOLOGY*
  Frank, M. G., Heller, H. C.
  1997; 272 (6): R1792-R1799

- **Metabotropic glutamate receptor activation modulates kainate and serotonin calcium response in astrocytes** *JOURNAL OF NEUROSCIENCE*
  Haak, L. L., Heller, H. C., VANDENPOL, A. N.
  1997; 17 (5): 1825-1837

- **Appropriate thermal manipulations eliminate tremors in rats recovering from halothane anesthesia** *JOURNAL OF APPLIED PHYSIOLOGY*
  Grahn, D. A., Heller, M. C., Larkin, J. E., Heller, H. C.
  1996; 81 (6): 2547-2554

- **Siberian hamsters free run or become arrhythmic after a phase delay of the photocycle** *AMERICAN JOURNAL OF PHYSIOLOGY-REGULATORY INTEGRATIVE AND COMPARATIVE PHYSIOLOGY*
  Ruby, N. F., Saran, A., Kang, T., Franken, P., Heller, H. C.
  1996; 271 (4): R881-R890

- **Ablation of suprachiasmatic nucleus alters timing of hibernation in ground squirrels** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
  Ruby, N. F., Dark, J., Heller, H. C., Zucker, I.
  1996; 93 (18): 9864-9868

- **Temperature sensitivity of the suprachiasmatic nucleus of ground squirrels and rats in vitro** *JOURNAL OF BIOLOGICAL RHYTHMS*
  Ruby, N. F., Heller, H. C.
  1996; 11 (2): 126-136

- **Temperature sensitivity of sleep homeostasis during hibernation in the golden-mantled ground squirrel** *AMERICAN JOURNAL OF PHYSIOLOGY-REGULATORY INTEGRATIVE AND COMPARATIVE PHYSIOLOGY*
  Larkin, J. E., Heller, H. C.
  1996; 270 (4): R777-R784

- **ADENOSINE PRESYNAPTIC AND POSTSYNAPTIC MODULATION OF GLUTAMATE-DEPENDENT CALCIUM ACTIVITY IN HYPOTHALAMIC NEURONS** *JOURNAL OF NEUROPHYSIOLOGY*
  Obrietan, K., Belousov, A. B., Heller, H. C., VANDENPOL, A. N.
  1995; 74 (5): 2150-2162

- **APAMIN, A SELECTIVE SK POTASSIUM CHANNEL BLOCKER, SUPPRESSES REM-SLEEP WITHOUT A COMPENSATORY REBOUND** *BRAIN RESEARCH*
  Benington, J. H., WOUDENBERG, M. C., Heller, H. C.
  1995; 692 (1-2): 86-92

- **STIMULATION OF A(1) ADENOSINE RECEPTORS MIMICS THE ELECTROENCEPHALOGRAPHIC EFFECTS OF SLEEP-DEPRIVATION** *BRAIN RESEARCH*
  Benington, J. H., Kodali, S. K., Heller, H. C.
  1995; 692 (1-2): 79-85

- **MONOAMINERGIC AND CHOLINERGIC MODULATION OF REM-SLEEP TIMING IN RATS** *BRAIN RESEARCH*
  Benington, J. H., Heller, H. C.

1995; 681 (1-2): 141-146

- **SEQUENCE AND TISSUE DISTRIBUTION OF A CANDIDATE G-COUPLED RECEPTOR CLONED FROM RAT HYPOTHALAMUS** *BIOCHEMICAL AND BIOPHYSICAL RESEARCH COMMUNICATIONS*
  Welch, S. K., OHARA, B. F., Kilduff, T. S., Heller, H. C.
  1995; 209 (2): 606-613

- **NICOTINE PHASE-ADVANCES THE CIRCADIAN NEURONAL-ACTIVITY RHYTHM IN RAT SUPRACHIASMATIC NUCLEI EXPLANTS** *NEUROSCIENCE*
  Trachsel, L., Heller, H. C., Miller, J. D.
  1995; 65 (3): 797-803

- **RESTORATION OF BRAIN ENERGY-METABOLISM AS THE FUNCTION OF SLEEP** *PROGRESS IN NEUROBIOLOGY*
  Benington, J. H., Heller, H. C.
  1995; 45 (4): 347-360

- **GABA(A), GABA(C), AND NMDA RECEPTOR SUBUNIT EXPRESSION IN THE SUPRACHIASMATIC NUCLEUS AND OTHER BRAIN-REGIONS** *MOLECULAR BRAIN RESEARCH*
  OHARA, B. F., Andretic, R., Heller, H. C., Carter, D. B., Kilduff, T. S.
  1995; 28 (2): 239-250

- **NICOTINE ADMINISTRATION DIFFERENTIALLY AFFECTS GENE-EXPRESSION IN THE MATERNAL AND FETAL CIRCADIAN CLOCK** *DEVELOPMENTAL BRAIN RESEARCH*
  CLEGG, D. A., OHARA, B. F., Heller, H. C., Kilduff, T. S.
  1995; 84 (1): 46-54

- **ONTOGENY OF PHOTIC-INDUCED C-FOS MESSENGER-RNA EXPRESSION IN RAT SUPRACHIASMATIC NUCLEI** *NEUROREPORT*
  Leard, L. E., Macdonald, E. S., Heller, H. C., Kilduff, T. S.
  1994; 5 (18): 2683-2687

- **DOES THE FUNCTION OF REM-SLEEP CONCERN NON-REM SLEEP OR WAKING** *PROGRESS IN NEUROBIOLOGY*
  Benington, J. H., Heller, H. C.
  1994; 44 (5): 433-449

- **REM-SLEEP PROPENSITY ACCUMULATES DURING 2-H REM-SLEEP DEPRIVATION IN THE REST PERIOD IN RATS** *NEUROSCIENCE LETTERS*
  Benington, J. H., WOUDENBERG, M. C., Heller, H. C.
  1994; 180 (1): 76-80

- **C-FOS MESSENGER-RNA IN THE SUPRACHIASMATIC NUCLEI IN-VITRO SHOWS A CIRCADIAN-RHYTHM AND RESPONDS TO A SEROTONERGIC AGONIST** *MOLECULAR BRAIN RESEARCH*
  Prosser, R. A., Macdonald, E. S., Heller, H. C.
  1994; 25 (1-2): 151-156

- **REM-SLEEP TIMING IS CONTROLLED HOMEOSTATICALLY BY ACCUMULATION OF REM-SLEEP PROPENSITY IN NON-REM SLEEP** *AMERICAN JOURNAL OF PHYSIOLOGY*
  Benington, J. H., Heller, H. C.
  1994; 266 (6): R1992-R2000

- **SEROTONERGIC PHASE ADVANCES OF THE MAMMALIAN CIRCADIAN CLOCK INVOLVE PROTEIN-KINASE-A AND K+ CHANNEL OPENING** *BRAIN RESEARCH*
  Prosser, R. A., Heller, H. C., Miller, J. D.
  1994; 644 (1): 67-73

- **A POSSIBLE GLIAL ROLE IN THE MAMMALIAN CIRCADIAN CLOCK** *BRAIN RESEARCH*
  Prosser, R. A., Edgar, D. M., Heller, H. C., Miller, J. D.
  1994; 643 (1-2): 296-301

- **PERSISTENCE OF CIRCADIAN RHYTHMICITY IN HIBERNATING GROUND-SQUIRRELS** *AMERICAN JOURNAL OF PHYSIOLOGY*
  Grahn, D. A., Miller, J. D., HOUNG, V. S., Heller, H. C.
  1994; 266 (4): R1251-R1258

- **THERMAL EFFECTS ON NEURONAL-ACTIVITY IN SUPRACHIASMATIC NUCLEI OF HIBERNATORS AND NONHIBERNATORS** *AMERICAN JOURNAL OF PHYSIOLOGY*
  Miller, J. D., Cao, V. H., Heller, H. C.
  1994; 266 (4): R1259-R1266

- **SCORING TRANSITIONS TO REM-SLEEP IN RATS BASED ON THE EEG PHENOMENA OF PRE-REM SLEEP - AN IMPROVED ANALYSIS OF SLEEP STRUCTURE** *SLEEP*
  Benington, J. H., Kodali, S. K., Heller, H. C.
  1994; 17 (1): 28-36

- **C-FOS MESSENGER-RNA INCREASES IS THE GROUND-SQUIRREL SUPRACHIASMATIC NUCLEUS DURING AROUSAL FROM HIBERNATION** *NEUROSCIENCE LETTERS*
  Bitting, L., SUTIN, E. L., Watson, F. L., Leard, L. E., OHARA, B. F., Heller, H. C., Kilduff, T. S.
  1994; 165 (1-2): 117-121

- **CHLORIDE CHANNEL BLOCK PHASE ADVANCES THE SINGLE-UNIT ACTIVITY RHYTHM IN THE SCN** *BRAIN RESEARCH BULLETIN*
  Rangarajan, R., Heller, H. C., Miller, J. D.
  1994; 34 (1): 69-72

- **LIGHT-INDUCED GENE-EXPRESSION IN THE SUPRACHIASMATIC NUCLEUS OF YOUNG AND AGING RATS** *NEUROBIOLOGY OF AGING*
  SUTIN, E. L., Dement, W. C., Heller, H. C., Kilduff, T. S.
  1993; 14 (5): 441-446

- **SEROTONIN AND THE MAMMALIAN CIRCADIAN SYSTEM .1. INVITRO PHASE-SHIFTS BY SEROTONERGIC AGONISTS AND ANTAGONISTS** *JOURNAL OF BIOLOGICAL RHYTHMS*
  Prosser, R. A., Dean, R. R., Edgar, D. M., Heller, H. C., Miller, J. D.
  1993; 8 (1): 1-16

- **IMMEDIATE EARLY GENE-EXPRESSION IN BRAIN DURING SLEEP-DEPRIVATION - PRELIMINARY-OBSERVATIONS** *SLEEP*
  OHARA, B. F., Young, K. A., Watson, F. L., Heller, H. C., Kilduff, T. S.
  1993; 16 (1): 1-7

- **MELATONIN INFLUENCES FOS EXPRESSION IN THE RAT SUPRACHIASMATIC NUCLEUS** *MOLECULAR BRAIN RESEARCH*
  Kilduff, T. S., LANDEL, H. B., Nagy, G. S., SUTIN, E. L., Dement, W. C., Heller, H. C.
  1992; 16 (1-2): 47-56

- **SLEEP HOMEOSTASIS IN SUPRACHIASMATIC NUCLEI-LESIONED RATS - EFFECTS OF SLEEP-DEPRIVATION AND TRIAZOLAM ADMINISTRATION** *BRAIN RESEARCH*
  Trachsel, L., Edgar, D. M., Seidel, W. F., Heller, H. C., Dement, W. C.
  1992; 589 (2): 253-261

- **Monoaminc and metabolite levels in the cerebrospinal fluid of hibernating and euthermic marmots.** *Journal of sleep research*
  Reid, M. S., Kilduff, T. S., Romero, L. M., Florant, G. L., Dement, W. C., Heller, H. C.
  1992; 1 (1): 45-50

- **MONOAMINE AND METABOLITE LEVELS IN THE CEREBROSPINAL-FLUID OF HIBERNATING AND EUTHERMIC MARMOTS** *JOURNAL OF SLEEP RESEARCH*
  Reid, M. S., Kilduff, T. S., Romero, L. M., Florant, G. L., Dement, W. C., Heller, H. C.
  1992; 1 (1): 45-50

- **SEROTONERGIC PHASE-SHIFTS OF THE MAMMALIAN CIRCADIAN CLOCK - EFFECTS OF TETRODOTOXIN AND HIGH MG2+** *BRAIN RESEARCH*
  Prosser, R. A., Heller, H. C., Miller, J. D.
  1992; 573 (2): 336-340

- **REGIONAL CHANGES IN CENTRAL MONOAMINE AND METABOLITE LEVELS DURING THE HIBERNATION CYCLE IN THE GOLDEN-MANTLED GROUND-SQUIRREL** *BRAIN RESEARCH*
  Haak, L. L., Mignot, E., Kilduff, T. S., Dement, W. C., Heller, H. C.
  1991; 563 (1-2): 215-220

- **ARE GROUND-SQUIRRELS SLEEP-DEPRIVED DURING HIBERNATION** *AMERICAN JOURNAL OF PHYSIOLOGY*

Trachsel, L., Edgar, D. M., Heller, H. C.
1991; 260 (6): R1123-R1129

- **RETICULAR-FORMATION ACTIVITY DURING WAKEFULNESS AND SLEEP IN A HIBERNATOR (SPERMOPHILUS-LATERALIS)** *BRAIN RESEARCH*
  Krilowicz, B. L., Edgar, D. M., Heller, H. C.
  1991; 540 (1-2): 266-272
- **A SEROTONIN AGONIST PHASE-SHIFTS THE CIRCADIAN CLOCK IN THE SUPRACHIASMATIC NUCLEI INVITRO** *BRAIN RESEARCH*
  Prosser, R. A., Miller, J. D., Heller, H. C.
  1990; 534 (1-2): 336-339
- **C-14 2-DEOXYGLUCOSE UPTAKE IN THE GROUND-SQUIRREL BRAIN DURING ENTRANCE TO AND AROUSAL FROM HIBERNATION** *JOURNAL OF NEUROSCIENCE*
  Kilduff, T. S., Miller, J. D., Radeke, C. M., Sharp, F. R., Heller, H. C.
  1990; 10 (7): 2463-2475
- **SUPRACHIASMATIC NUCLEI INFLUENCE HIBERNATION RHYTHMS OF GOLDEN-MANTLED GROUND-SQUIRRELS** *BRAIN RESEARCH*
  Dark, J., Kilduff, T. S., Heller, H. C., Licht, P., Zucker, I.
  1990; 509 (1): 111-118
- **FUNCTIONAL MAPPING OF BRAIN ACTIVITY DURING AROUSAL STATES - MAMMALIAN HIBERNATION AS A MODEL SYSTEM** *2ND INTERNATIONAL SYMP ON ENDOGENOUS SLEEP FACTORS*
  Kilduff, T. S., Dement, W. C., Heller, H. C.
  S P B ACADEMIC PUBL.1990: 229–239
- **ACTIVITY OF MOST ROSTRAL VENTROMEDIAL MEDULLA NEURONS REFLECT EEG EMG PATTERN CHANGES** *AMERICAN JOURNAL OF PHYSIOLOGY*
  Grahn, D. A., Heller, H. C.
  1989; 257 (6): R1496-R1505
- **ACTION-POTENTIAL DURATION INCREASES AS BODY-TEMPERATURE DECREASES DURING HIBERNATION** *BRAIN RESEARCH*
  Krilowicz, B. L., Edgar, D. M., Heller, H. C.
  1989; 498 (1): 73-80
- **SUPRACHIASMATIC NUCLEUS - PHASE-DEPENDENT ACTIVATION DURING THE HIBERNATION CYCLE** *AMERICAN JOURNAL OF PHYSIOLOGY*
  Kilduff, T. S., Radeke, C. M., RANDALL, T. L., Sharp, F. R., Heller, H. C.
  1989; 257 (3): R605-R612
- **AROUSAL STATE VS TEMPERATURE EFFECTS ON NEURONAL-ACTIVITY IN SUBCOERULEUS AREA** *AMERICAN JOURNAL OF PHYSIOLOGY*
  Grahn, D. A., Radeke, C. M., Heller, H. C.
  1989; 256 (4): R840-R849
- **REGULATED NOCTURNAL HYPOTHERMIA INDUCED IN PIGEONS BY FOOD-DEPRIVATION** *AMERICAN JOURNAL OF PHYSIOLOGY*
  Graf, R., Krishna, S., Heller, H. C.
  1989; 256 (3): R733-R738
- **A REEVALUATION OF PURPORTED THERMOAFFERENT FUNCTION OF CELLS IN THE SUBCOERULEUS AREA AND THE NUCLEUS RAPHE MAGNUS** *INTERNATIONAL SATELLITE SYMP TO THE 31ST CONGRESS OF THE INTERNATIONAL UNION OF PHYSIOLOGICAL SCIENCES : THERMAL PHYSIOLOGY*
  Grahn, D. A., Heller, H. C.
  ELSEVIER SCIENCE PUBL B V.1989: 95–100
- **NEURONAL-ACTIVITY DURING SLEEP AND COMPLETE BOUTS OF HIBERNATION** *AMERICAN JOURNAL OF PHYSIOLOGY*
  Krilowicz, B. L., GLOTZBACH, S. F., Heller, H. C.
  1988; 255 (6): R1008-R1019
- **PROGRESSIVE ACTIVATION OF PARATRIGEMINAL NUCLEUS DURING ENTRANCE TO HIBERNATION** *AMERICAN JOURNAL OF PHYSIOLOGY*

Kilduff, T. S., Sharp, F. R., Heller, H. C.
1988; 255 (1): R178-R181

- **MODULATION OF ACTIVITY OF THE STRIATAL DOPAMINERGIC SYSTEM DURING THE HIBERNATION CYCLE** *JOURNAL OF NEUROSCIENCE*
  Kilduff, T. S., Bowersox, S. S., Faull, K. F., ZELLERDEAMICIS, L., Radeke, C. M., CIARANELLO, R. D., Heller, H. C., BARCHAS, J. D., Dement, W. C.
  1987; 7 (9): 2732-2736
- **ACTIVITY OF SUPRACHIASMATIC AND HYPOTHALAMIC NEURONS DURING SLEEP AND WAKEFULNESS IN THE RAT** *BRAIN RESEARCH*
  GLOTZBACH, S. F., CORNETT, C. M., Heller, H. C.
  1987; 419 (1-2): 279-286
- **VOLUNTARY HYPOMETABOLISM IN AN INDIAN YOGI** *JOURNAL OF THERMAL BIOLOGY*
  Heller, H. C., Elsner, R., Rao, N.
  1987; 12 (2): 171-173
- **ABSENCE OF A CIRCADIAN-RHYTHM OF PROTEIN-SYNTHESIS IN THE RAT SUPRACHIASMATIC NUCLEUS** *NEUROSCIENCE LETTERS*
  GLOTZBACH, S. F., RANDALL, T. L., Radeke, C. M., Heller, H. C.
  1987; 76 (1): 113-118
- **INFLUENCE OF SPINAL AND HYPOTHALAMIC WARMING ON METABOLISM AND SLEEP IN PIGEONS** *AMERICAN JOURNAL OF PHYSIOLOGY*
  Graf, R., Heller, H. C., Sakaguchi, S., Krishna, S.
  1987; 252 (4): R661-R667
- **CHANGES IN THE THERMAL-CHARACTERISTICS OF HYPOTHALAMIC NEURONS DURING SLEEP AND WAKEFULNESS** *BRAIN RESEARCH*
  GLOTZBACH, S. F., Heller, H. C.
  1984; 309 (1): 17-26
- **The physiology of hibernation.** *Science*
  Heller, H. C.
  1983; 220 (4597): 599-600
- **RELATIVE 2-DEOXYGLUCOSE UPTAKE OF THE PARATRIGEMINAL NUCLEUS INCREASES DURING HIBERNATION** *BRAIN RESEARCH*
  Kilduff, T. S., Sharp, F. R., Heller, H. C.
  1983; 262 (1): 117-123
- **SLIGHT WARMING OF THE SPINAL-CORD AND THE HYPOTHALAMUS IN THE PIGEON - EFFECTS ON THERMOREGULATION AND SLEEP DURING THE NIGHT** *JOURNAL OF THERMAL BIOLOGY*
  Graf, R., Heller, H. C., Sakaguchi, S.
  1983; 8 (1-2): 159-161
- **METABOLIC-ACTIVATION OF THE BRACHIUM CONJUNCTIVUM DURING INDUCED HYPOTHERMIA** *BRAIN RESEARCH*
  Kilduff, T. S., George, C. P., Sharp, F. R., Heller, H. C.
  1983; 269 (1): 168-171
- **CIRCADIAN AND AROUSAL STATE INFLUENCES ON THERMOREGULATION IN THE PIGEON** *AMERICAN JOURNAL OF PHYSIOLOGY*
  Heller, H. C., Graf, R., Rautenberg, W.
  1983; 245 (3): R321-R328
- **THE RELATIONSHIP OF LOCAL CEREBRAL GLUCOSE-UTILIZATION TO OPTICAL-DENSITY RATIOS** *BRAIN RESEARCH*
  Sharp, F. R., Kilduff, T. S., BZORGCHAMI, S., Heller, H. C., Ryan, A. F.
  1983; 263 (1): 97-103
- **AUTORADIOGRAPHIC PATTERNS OF HIPPOCAMPAL METABOLISM DURING INDUCED HYPOTHERMIA** *NEUROSCIENCE LETTERS*
  George, C. P., Kilduff, T. S., Sharp, F. R., Heller, H. C.
  1982; 34 (3): 233-239
- **[C-14]-LABELED 2-DEOXYGLUCOSE UPTAKE IN GROUND-SQUIRREL BRAIN DURING HIBERNATION** *JOURNAL OF NEUROSCIENCE*

Kilduff, T. S., Sharp, F. R., Heller, H. C.
1982; 2 (2): 143-157

- **HIBERNATION AT MODERATE TEMPERATURES - A CONTINUATION OF SLOW-WAVE SLEEP** *EXPERIENTIA*
  Walker, J. M., Haskell, E. H., Berger, R. J., Heller, H. C.
  1981; 37 (7): 726-728
- **THE EFFECTS OF HIGH AND LOW AMBIENT-TEMPERATURES ON HUMAN SLEEP STAGES** *ELECTROENCEPHALOGRAPHY AND CLINICAL NEUROPHYSIOLOGY*
  Haskell, E. H., PALCA, J. W., Walker, J. M., Berger, R. J., Heller, H. C.
  1981; 51 (5): 494-501
- **METABOLISM AND THERMOREGULATION DURING STAGES OF SLEEP IN HUMANS EXPOSED TO HEAT AND COLD** *JOURNAL OF APPLIED PHYSIOLOGY*
  Haskell, E. H., PALCA, J. W., Walker, J. M., Berger, R. J., Heller, H. C.
  1981; 51 (4): 948-954
- **HIBERNATION AND CIRCANNUAL RHYTHMS OF SLEEP** *PHYSIOLOGICAL ZOOLOGY*
  Walker, J. M., Haskell, E. H., Berger, R. J., Heller, H. C.
  1980; 53 (1): 8-11
- **HIBERNATION - NEURAL ASPECTS** *ANNUAL REVIEW OF PHYSIOLOGY*
  Heller, H. C.
  1979; 41: 305-321
- **INFLUENCE OF HYPOTHALAMIC AND AMBIENT-TEMPERATURES ON SLEEP IN KANGAROO RATS** *AMERICAN JOURNAL OF PHYSIOLOGY*
  Sakaguchi, S., GLOTZBACH, S. F., Heller, H. C.
  1979; 237 (1): R80-R88
- **SLEEP AND ESTIVATION (SHALLOW TORPOR) - CONTINUOUS PROCESSES OF ENERGY-CONSERVATION** *SCIENCE*
  Walker, J. M., Garber, A., Berger, R. J., Heller, H. C.
  1979; 204 (4397): 1098-1100
- **THERMOSTAT OF VERTEBRATE ANIMALS** *SCIENTIFIC AMERICAN*
  Heller, H. C., Crawshaw, L. I., Hammel, H. T.
  1978; 239 (2): 102-?
- **CNS REGULATION OF BODY-TEMPERATURE DURING SLEEP AND HIBERNATION**
  Heller, H. C., Walker, J., Florant, G., GLOTZBACH, S., Berger
  PERGAMON-ELSEVIER SCIENCE LTD.1978: 91–91
- **TEMPERATURE REGULATION IN MARMOTS (MARMOTA-FLAVIVENTRIS) DURING ENTRANCE INTO HIBERNATION**
  Florant, G. L., Turner, B. M., Heller, H. C.
  PERGAMON-ELSEVIER SCIENCE LTD.1978: 92–92
- **Hypothalamic thermosensitivity in mammals.** *Experientia. Supplementum*
  Heller, H. C.
  1978; 32: 267-276
- **TEMPERATURE REGULATION DURING WAKEFULNESS, SLEEP, AND HIBERNATION IN MARMOTS** *AMERICAN JOURNAL OF PHYSIOLOGY*
  Florant, G. L., Turner, B. M., Heller, H. C.
  1978; 235 (1): R82-R88
- **CNS REGULATION OF BODY-TEMPERATURE IN EUTHERMIC AND HIBERNATING MARMOTS (MARMOTA-FLAVIVENTRIS)** *AMERICAN JOURNAL OF PHYSIOLOGY*
  Florant, G. L., Heller, H. C.
  1977; 232 (5): R203-R208
- **SLEEP AND HIBERNATION IN GROUND SQUIRRELS (CITELLUS SPP) - ELECTROPHYSIOLOGICAL OBSERVATIONS** *AMERICAN JOURNAL OF PHYSIOLOGY*

Walker, J. M., GLOTZBACH, S. F., Berger, R. J., Heller, H. C.
1977; 233 (5): R213-R221

- **THERMOREGULATION DURING ENTRANCE INTO HIBERNATION** *PFLUGERS ARCHIV-EUROPEAN JOURNAL OF PHYSIOLOGY*
  Heller, H. C., COLLIVER, G. W., Beard, J.
  1977; 369 (1): 55-59
- **THERMOREGULATORY RESPONSES TO ALTERING HYPOTHALAMIC TEMPERATURE IN HARBOR SEAL** *AMERICAN JOURNAL OF PHYSIOLOGY*
  Hammel, H. T., Elsner, R. W., Heller, H. C., MAGGERT, J. A., Bainton, C. R.
  1977; 232 (1): R18-R26
- **Thermoregulation during sleep and hibernation.** *International review of physiology*
  Heller, H. C., GLOTZBACH, S. F.
  1977; 15: 147-188
- **HYPOTHALAMIC THERMOSENSITIVITY AND REGULATION OF HEAT STORAGE BEHAVIOR IN A DIURNAL DESERT GROUND-SQUIRREL (AMMOSPERMOPHILUS-NELSONI)** *ISRAEL JOURNAL OF MEDICAL SCIENCES*
  Henderson, J. A., Heller, H. C.
  1976; 12 (9): 1029-1032
- **HYPOTHALAMIC THERMOSENSITIVITY AND REGULATION OF HEAT STORAGE BEHAVIOR IN A DAY-ACTIVE DESERT RODENT AMMOSPERMOPHILUS-NELSONI** *JOURNAL OF COMPARATIVE PHYSIOLOGY*
  Heller, H. C., Henderson, J. A.
  1976; 108 (3): 255-270
- **CENTRAL NERVOUS REGULATION OF BODY-TEMPERATURE DURING SLEEP** *SCIENCE*
  GLOTZBACH, S. F., Heller, H. C.
  1976; 194 (4264): 537-539
- **ELEVATED BLOOD-GLUCOSE LEVELS AND SATIETY IN RAT** *PHYSIOLOGY & BEHAVIOR*
  Wilson, W. H., Heller, H. C.
  1975; 15 (2): 137-143
- **CNS REGULATION OF METABOLIC-RATE IN KANGAROO RAT DIPODOMYS-INGENS** *AMERICAN JOURNAL OF PHYSIOLOGY*
  GLOTZBACH, S. F., Heller, H. C.
  1975; 228 (6): 1880-1886
- **CNS REGULATION OF BODY-TEMPERATURE DURING HIBERNATION** *AMERICAN JOURNAL OF PHYSIOLOGY*
  Heller, H. C., COLLIVER, G. W.
  1974; 227 (3): 583-589
- **CNS REGULATION OF BODY-TEMPERATURE IN EUTHERMIC HIBERNATORS** *AMERICAN JOURNAL OF PHYSIOLOGY*
  Heller, H. C., COLLIVER, G. W., Anand, P.
  1974; 227 (3): 576-582
- **PROBING ROSTRAL BRAIN-STEM OF ANESTHETIZED, UNANESTHETIZED, AND EXERCISING DOGS AND OF HIBERNATING AND EUTHERMIC GROUND SQUIRRELS** *FEDERATION PROCEEDINGS*
  Hammel, H. T., Heller, H. C., Sharp, F. R.
  1973; 32 (5): 1588-1597
- **CNS control of body temperature during hibernation.** *Comparative biochemistry and physiology. A, Comparative physiology*
  Heller, H. C., Hammel, H. T.
  1972; 41 (2): 349-359
- **CNS CONTROL OF BODY-TEMPERATURE DURING HIBERNATION** *COMPARATIVE BIOCHEMISTRY AND PHYSIOLOGY*
  Heller, H. C., Hammel, H. T.
  1972; 41 (2A): 349-?
- **CNS regulation of body temperature in the hibernator Citellus lateralis.** *International journal of biometeorology*
  Heller, H. C., Hammel, H. T.

1971; 15 (2): 231-235