

Resume: CHARLES T. ROBBINS

ADDRESS

School of the Environment and School of Biological Sciences, Washington State University, Pullman, WA 99164-4236. Phone: 509-335-1119 (office), 509-334-3423 (home). e-mail: ctrobbins@wsu.edu

EDUCATION

Post-doctorate - Cornell University, 1973-1974

Ph.D. - Cornell University, August 1973

Major: Wildlife Ecology

Minors: Animal Science and Animal Nutrition

Thesis Title: The Biological Basis for Determination of Carrying Capacity

Committee: Drs. A. N. Moen, P. J. Van Soest, J. T. Reid

M.S. - Syracuse University, December 1970

Major: Forest Zoology

B.S. - Colorado State University, March 1968

Major: Wildlife Biology, with High Distinction

APPOINTMENTS

Professor, School of the Environment and School of Biological Sciences, 2016-present.

Professor and Director of the WSU Bear Center, School of the Environment and School of Biological Sciences, 1986-2016. Accomplishments: expanded the nutritional ecology research program to include black and grizzly bear studies; developed and supervised a captive bear holding and research facility.

Professor and Chair, Program in Wildlife Biology, Washington State University, 1985-1988. Accomplishments: oversaw the expansion of the Wildlife Biology unit and participated in consolidating the Program in Wildlife Biology with the Department of Forestry and Range Management to create a new Department of Natural Resource Sciences.

Professor, Department of Zoology, Washington State University, 1984-1988. Accomplishments: developed an internationally recognized research program on the nutritional ecology of wild ruminants; established a wildlife nutrition course and published an appropriate textbook.

Associate Professor, Department of Zoology, Washington State University, 1979-1984.

Assistant Professor, Department of Zoology, Washington State University, 1974-1979.

TEACHING

I have taught a wide-range of zoology and wildlife courses, including Mammalogy, Wildlife Ecology, Stable Isotope Ecology, General Ecology, Wildlife Nutrition, and Principles of Wildlife Conservation. Student evaluations have ranged from 4.4 to 4.8 (5.0 scale).

Outstanding teacher, Department of Natural Resource Sciences, 1989-1990, 1990-1991.

RESEARCH AND ADMINISTRATIVE ACCOMPLISHMENTS (Most recent regarding the WSU Bear Center)**Brief Summary of the WSU Bear Center**

The WSU Bear Center was established in 1986 with funding from the US Fish and Wildlife Service. Biologists with that agency and others wanted a captive bear facility where close, detailed work could be done that could support their studies on wild bears. During the first 20 years, the scientific focus was primarily on the ecology and nutrition of grizzly bears. The captive bears have been used to produce either new methods or bits of information that could be used to understand the ecology or conservation of wild bears. It has been the synergism between studies on captive and wild bears that has made the WSU Bear Center unique. As the Center has matured, the original nutrition and ecology focus has shifted to include more studies of basic physiology, particularly during hibernation. The processes of hibernation are of interest to a wide-range of physiologists because of the parallels and differences to disease states in people and pets. The inactivity and impaired organ function during hibernation is a normal life process in bears from which they fully recover once hibernation is complete. However, similar inactivity in people and pets can lead to irreparable losses in muscle strength and endurance, bone density, and heart function. Thus, a sizeable research group located primarily in the WSU College of Veterinary Medicine has requested facilities and bears for basic science studies that one day might have treatment implications. More recently, a group from Amgen started using the bears to examine human implications for the "extreme biology" that occurs during hibernation. Similarly, tissue samples have been sent to other researchers in Europe and throughout the US. Thus, the WSU Bear Center has become a campus-wide, internationally-renown, interdisciplinary research program. Past graduate students have been trained in the College of Sciences (School of Biological Sciences), the College of Agricultural, Human and Natural Resource Sciences (School of the Environment and Department of Animal Sciences), and the College of Veterinary Medicine. Finally, the Bear Center is the most publicly-accessible and visited animal research program at WSU.

Participating faculty and students in the Bear Center

Faculty

Dr. Charles Robbins, School of the Environment and School of Biological Sciences,
College of Agricultural, Human and Natural Resource Sciences and College of
Sciences

Dr. Lynne Nelson, Cardiologist, Department of Veterinary Clinical Sciences, College of
Veterinary Medicine

Dr. Heiko Jansen, Department of Integrative Physiology and Neuroscience, College of
Veterinary Medicine

Dr. David Lin, Department of Integrative Physiology and Neuroscience and Biological
Systems Engineering, College of Veterinary Medicine and College of Engineering

Dr. Joanna Kelley, School of Biological Sciences, College of Arts and Sciences

Dr. Chantal Vella, Department of Movement Sciences, University of Idaho

Dr. Craig McGowan, Department of Biological Sciences, University of Idaho

Graduate students

Eighteen graduate students have completed MS or PhD programs, and an additional six are currently enrolled. WSU students have completed their degree programs in the School of Biological Sciences, School of the Environment, and the College of Veterinary Medicine. Additional students who have used the WSU bears in their degree programs have graduated from Texas A&M, Oregon State University, University of Idaho, Michigan Tech, University of Wyoming, and Colorado State University.

Undergraduate and graduate student learning experiences on bear projects

Many undergraduates participate in the Bear Program each year. We offer an assortment of opportunities, ranging from participating as assistants in Alaskan or Yellowstone field studies to working at the captive bear facility. On average, 35 undergraduates participate in the Bear Program each year.

National Science Foundation Graduate Research Fellow working at the Bear Center

Kimberly Rigano, 2014-2016

National Institutes of Health Summer Research Fellows that worked at the Bear Center

Betty Ma, 2005

Abbey Burgess, 2007

Rachel Wood, 2009

Rachel Wood, 2010

Nicole Froelich, 2011

Morris Animal Foundation Student Scholar that worked at the Bear Center

Nicole Zuniga, 2010

Visiting scientists who have used the WSU bear facilities have come from the San Diego Zoo, National Zoo in Washington DC, Texas A&M, Oregon State University, Oakland University, University of Idaho, Colorado State University, University of Wyoming, Glacier National Park, Yellowstone National Park, and federal USGS labs in Bozeman, Denver, and Anchorage.

Current positions of past graduate students from the Bear Center

Dr. Dave Hewitt, Professor, Texas A&M Kingsville
 Geoff Pritchard, Laboratory Assistant, University of Idaho
 Christy Welch, Laboratory Instructor, Central Washington University
 Dr. Sean Farley, Bear biologist for southern Alaska, Alaska Department of Fish and Game
 Dr. Grant Hilderbrand, Supervisory biologist, USGS, Anchorage
 Dr. Karyn Rode, Polar bear biologist, USGS, Anchorage
 Michael Jacoby, Ecologist, PNNL, Richland, WA
 Dr. Troy Tollefson, Nutritionist, Mazuri feed products
 Dr. Jennifer Fortin, Grizzly Bear Recovery assistant, USFWS, Missoula
 Dr. Jasmine Ware, Polar bear studies, USGS, Anchorage
 Steve Partridge, Wildlife Biologist, USGS, Anchorage, currently a stay-at-home dad
 Dr. Laura Felicetti, Honors Program, University of Indiana
 Dr. Justin Teisberg, Grizzly bear biologist, USFWS, Montana and Idaho
 Scott Florin, Biologist, Kleinfelder consulting firm, Denver
 Joy Erlenbach, Staff biologist, WSU Bear Center and initiating a PhD program
 Regan McGowan, Nestle Purina Research, St. Louis
 Dr. Heidi Keen, deceased
 Danielle Rivet, PhD student, University of Saskatchewan

Funding has been provided by:

National Institutes of Health and National Science Foundation
 Federal conservation agencies such as US Geological Survey, US Fish and Wildlife Service, US Forest Service, and National Park Service
 State wildlife conservation agencies, such as Alaska, Washington, Idaho, Montana, and Wyoming
 Chevron USA
 Washington Forest Protective Association
 Amgen
 Numerous individual donors.

Support for WSU bear research and related activities obtained since the inception of the program has totaled approximately \$6 million. This includes both grants coming through WSU as well as agency or corporate support for graduate student field and laboratory projects.

Endowments: Major emphasis has been invested in seeking donors for endowment funding. Amounts in the current endowments include:

Nutritional Ecology Research Endowment - \$202,382

Raili Korkka Bear Research Endowment - \$177,784

Brown Bear Research and Conservation Endowment - \$45,000

PUBLICATIONS: Journals

Citation Record:

Sum of times cited: 6457

h-index: 45

Citations per year (2015): 467

Nelson, O.L., R.M. Wood, J. Häggström, C. Kwart, and C.T. Robbins. 2017. Myocardial adiponectin isoform shift in dogs with congestive heart failure- a comparison to hibernating brown bears (*Ursus arctos horribilis*). *Veterinary Sciences* (submitted and revised 4/27/2017).

Deacy, W., J.B. Armstrong, W.B. Leacock, C.T. Robbins, D.D. Gustine, E.J. Ward, J.A. Erlenbach, and J.A. Stanford. 2017. Phenological synchronization disrupts a keystone trophic interaction. *Proceedings of the National Academy of Sciences* (acceptance 7/7/2017).

Keay, J.A., C.T. Robbins, S.D. Farley, and G.V.Hilderbrand. 2017. Population regulation of Denali grizzly bears. *Journal of Wildlife Management* (submitted 11/29/2016).

Mugahid, D.A., T.G. Sengul, X. You, Y. Wang, L. Steil, N. Bergmann, M. H. Radke, A. Ofenbauer, M. Gesell-Salazar, A. Balogh, B. Tursun, C. T. Robbins, U. Völker, W. Chen, L. Nelson, and M. Gotthardt. 2017. Proteomic and transcriptomic changes in hibernating grizzly bears reveal cellular mechanisms that protect against muscle atrophy. *Journal of Clinical Investigations* (submitted 3/1/2017).

Teisberg, J.E., B.M. Kemp, C.C. Schwartz, M.A. Haroldson, C. Monroe, L.P. Waits, J.K. Fortin, R.D. Mace, K.A. Gunther, and C.T. Robbins. 2017. Balancing drift and flow: A genetic investigation of Greater Yellowstone Ecosystem (GYE) black bears. *Molecular Ecology* (submitted 6/5/2016).

Rivet, D.R., O.L. Nelson, C.A. Vella, H.T. Jansen, and C.T. Robbins. 2017. Systemic effects of a high saturated fat diet in grizzly bears (*Ursus arctos horribilis*). *Canadian Journal of Zoology* (Revised 3/6/2017).

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- Shine, C.L., C.T. Robbins, O.L. Nelson, and C.P. McGowan. 2017. Grizzly bear (*Ursus arctos horribilis*) locomotion: forelimb joint mechanics across speed in the sagittal and frontal planes. *Journal of Experimental Biology* 220:1322-1329.
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- Pagano, A.M., K.D. Rode, A. Cutting, M.A. Owen, S. Jensen, J.V. Ware, C.T. Robbins, G.M. Durner, T.C. Atwood, M.E. Obbard, K.R. Middel, G.W. Thiemann, and T.M. Williams. 2017. Using tri-axial accelerometers to identify wild polar bear behaviors. *Endangered Species Research* 32:19-33.
- Waroff, A.J., L. Fanucchi, C.T. Robbins, and O.L. Nelson. 2017. Tool use, problem-solving, and the display of stereotypic behaviors in the brown bear (*Ursus arctos*). *Journal of Veterinary Behavior* 17:62-68.
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- Jansen, H., T. Leise, G. Stenhouse, K. Pigeon, W. Kasworm, J. Teisberg, T. Radant, R. Dallmann, S. Brown, and C.T. Robbins. 2016. The bear circadian clock doesn't sleep in hibernation. *Frontiers in Zoology* 13: Article Number: 42, DOI: 10.1186/s12983-016-0173-x.
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- Ware, J.V., K.D. Rode, A.M. Pagano, J. Bromaghin, C.T. Robbins, J. Erlenbach, S. Jensen, A. Cutting, N. Nicassio-Hiskey, A. Nash, M. Owen, and H.T. Jansen. 2015. Validation of mercury tip-switch and accelerometer activity sensors for identifying resting and active behavior in bears. *Ursus* 26:86-96.
- Nelson, O.L., and C.T. Robbins. 2015. Cardiovascular function in large to small hibernators: bears to ground squirrels. *Journal of Comparative Physiology B* 185:265-279.
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- Noel, M., J.R. Christensen, J. Spence, and C.T. Robbins. 2015. Using laser ablation inductively coupled plasma mass spectrometry (LA-ICP-MS) to characterize copper, zinc and mercury along grizzly bear hair providing estimate of diet. *Science of the Total Environment* 529:1-9.
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- Teisberg, J.E., M.A. Haroldson, C.C. Schwartz, K.A. Gunther, J.K. Fortin, and C.T. Robbins. 2014. Contrasting past and current numbers of bears visiting Yellowstone cutthroat trout streams. *Journal of Wildlife Management* 78:369-378.
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- Schwartz, C.C., J.K. Fortin, J.E. Teisberg, M.A. Haroldson, C. Servhenn, C.T. Robbins, and F. Van Manen. 2014. Use of isotopic sulfur to determine whitebark pine consumption by Yellowstone bears: A reassessment. *Wildlife Society Bulletin* 38:664-670.
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- Lopez-Alfaro, C., C.T. Robbins, A. Zedrosser, and S.E. Nielsen. 2013. Energetics of hibernation and reproductive trade-offs in brown bears. *Ecological Modeling* 270:1-10.
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INVITED PAPERS, SHORT COURSES, OR PRESENTATIONS AT SYMPOSIA

Robbins, C. T., O. T. Oftedal, and K. I. O'Rourke. 1982. Lactation, early nutrition, and hand-rearing of wild ungulates, with special reference to deer. *Biology and management of the Cervidae*. Smithsonian Inst. Press and The National Zoo, Washington, DC.

Robbins, C. T., T. A. Hanley, K. L. Parker, M. L. Wickstrom, and D. E. Spalinger. 1983. Energy and nutrient constraints to ungulate foraging. Symposium: Physiological Ecology of Plant-Herbivore Interactions. Ecological Society of America Annual Meeting, August 7-11, 1983. Grand Forks, North Dakota.

Robbins, C. T., T. A. Hanley, A. E. Hagerman, and D. E. Spalinger. 1986. Recent tests of ecological and evolutionary theories using ungulate nutrition results. *In Ungulates: their role in the development of ecological and evolutionary theory*. American Society of Mammalogists Annual Meeting, June 17, 1986. Madison, Wisconsin.

Robbins, C. T., A. E. Hagerman, and T. A. Hanley. 1986. The role of tannins in defending plants against ruminants. Society of Chemical Ecologists Annual Meeting, June 23, 1986. Berkeley, California.

Robbins, C. T. 1987. Energetics of wild ruminants. NCE-course on time-energy budgets of vertebrates. 1-4 September, Dokka, Norway.

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- Hanley, T. A., C. T. Robbins, and D. E. Spalinger. 1991. Influence of the forest environment on nutritional ecology of black-tailed deer in Alaska. pp. 357-361. *In* Global trends in wildlife management. *Eds.* B. Bobek, K. Perzanowski, and W. L. Regelin. Trans. 18th IUGB Congress, Krakow, Poland.
- Robbins, C. T. 1991. Wildlife nutrition and foraging ecology. Short course sponsored by the Swedish Agricultural University, Umea. March 18-21, 1991.
- Owen-Smith, N., C. T. Robbins, and A. E. Hagerman. 1993. Browse and browsers: Interactions between woody plants and mammalian herbivores. *Trends in Ecol. and Evol.* 8:158-160. Summary of a symposium held in South Africa, October, 1992.
- Robbins, C.T. 1995. Nutritional ecology of bears. Greater Yellowstone Predators Conference. September 24-27, Mammoth Hot Springs.
- Robbins, C.T. 1996. Stable isotopes and energetics of bears. Interagency Grizzly Bear Committee Meeting, June 4-6, Yellowstone National Park.
- Robbins, C.T. 2003. Understanding the energetics of ursid reproduction. Carnivore Reproduction Workshop, with implication for Giant Pandas, San Diego Zoo, February 3, 2003.
- Robbins, C.T., C.C. Schwartz, and L.A. Felicetti. 2004. Nutritional ecology of ursids: A review of newer methods and management implications. 15th International Conference on Bear Research and Management, February 8-13, 2004. San Diego, CA.
- Robbins, C.T., K.D. Rode, J.K. Fortin, L.A. Shipley, S.D. Farley, and L.A. Felicetti. 2006. Brown bears do well on extreme diets, but prefer nutritionally balanced diets. Keynote address, Comparative Nutrition Society, Keystone Resort, August 8, 2006.
- Robbins, C.T. 2009. Speaker and outside expert in USGS review of polar bear and walrus research, Anchorage, Alaska. December 10-11.

Robbins, C.T. 2011. Grizzly bear nutrition, physiology and ecology. The James G. Morris Lectureship in Companion Animal Nutrition. February 7, 2011, University of California, College of Veterinary Medicine, Davis.

AWARDS AND RECOGNITION

1986. Outstanding Publication Award (Journal category), The Wildlife Society. Shared with K. L. Parker and T. A. Hanley for Energy expenditures for locomotion by mule deer and elk. J. Wildl. Manage. 48:474-488.

UNIVERSITY AND DEPARTMENTAL COMMITTEE SERVICE

Chair, University-wide Committee to create a Center for Conservation
Biology/Biodiversity
Institutional Animal Care and Use Committee
Graduate Admissions Committees
Science Hall Building Committee
Graduate Student Coordinator, Zoology
Graduate Student Awards Committee, Zoology
Numerous Faculty and Departmental Chair Search Committees

INVITED UNIVERSITY OR INSTITUTE LECTURES

University of California-Davis, UC-Irvine, University of Idaho, University of British Columbia, Colorado State University, University of Maine, University of Minnesota-Duluth, Texas A&I, Virginia Polytechnic Institute and State University, University of Alaska - Fairbanks, University of Pretoria, Norwegian Institute for Nature Research, University of Saskatchewan, University of the Witwatersrand (South Africa), University of Aristotle (Greece), Cornell, University of Montana, University of Washington

CONSULTING

Special consultant, \$7.5 million Grizzly Bear Research-Display Facility, West Yellowstone, Montana, 1991.

U.S. State Department funded consultant to Greece regarding bear conservation, October 1995.

Interviews of Bear Center faculty and staff for newspaper, television and radio:

1. Learning from healthy bears (you mean we should hibernate?) July 4, 2016. New York Times
2. What a grizzly bear's hair reveals about its diet. August 5, 2015. The Wildlife Society.
3. WSU scientists testing grizzly hair to track eating habits, Yakima Herald July 29, 2015

4. Taking a walk in the bear park. Pullman/Moscow Daily News, April 2015
5. Pac-12 Network, Grizzly bears get front row seat. April 29, 2015
6. PBS *In Close* A Grizzly Cure for Diabetes? February 2015
7. Al Jazeera America, April 8 2014, Bear Research at Washington State University
8. A grizzly answer for obesity. New York Times, February 12, 2014
9. Obesity researchers turn to some really big eaters. Scientists study grizzly bears, carefully. Wall Street Journal, December 16, 2013
10. The heart of bears and men. WSU researchers find clues in grizzlies' tickers that could help fight cardiovascular disease. Spokesman Review, Feb 19, 2013.
11. Squirrel juggling and sleepy bears: Hibernators may hold key to human maladies like diabetes, osteoporosis. The Bulletin, Bend OR, February 17, 2013
12. Washington grizzly bear research could help remedy human diseases. NBC Montana News, Oct 26, 2012
13. WSU researchers look to find what makes grizzlies happy, KREM News, Oct 18, 2012
14. But we're not sleepy yet! Lewiston Tribune, Oct 9, 2012
15. WSU Researchers Studying Bears' Hibernation To Narrow Down A Cure For Diabetes, National Public Radio, March 7, 2012
16. Bad year for grizzlies. The Oregonian, Dec 26, 2011
17. Physiological and Biochemical Zoology- Press release regarding featured article (and cover photo)- Barrows N, *Nelson OL, Robbins CT, Rourke B. Increased cardiac alpha myosin heavy-chain in left atria and decreased myocardial IGF-1 expression accompanies hibernation-induced bradycardia in grizzly bears. *Physiol Biochem Zool.* 2011 Jan-Feb;84(1):1-17.
18. AAAS (Science Now). What we can learn from hibernating bears? Jan 2011
19. Web MD. Healthy Hibernating Hearts. April 2011
20. Science News. What's new in Nature? Jan 2011
21. Associated Press. Hibernating bears have healthy hearts. July 17, 2010.
22. WSU today. Human heart disease key may lie with hibernating grizzly bears. June 24, 2010.
23. WSU today. Quick turnaround: grizzly diagnosed, treated and returned to West Yellowstone. Feb 22, 2010.
24. KHQ TV, Spokane. Research on grizzly bears could provide insight into humans. Feb 19, 2010.
25. KXLY TV, Spokane. WSU provides care for sick grizzly bear from West Yellowstone. Feb 20, 2010.
26. Miller McCune Magazine- Science and Environment. Ground Control to Yogi Bear. Jan 30, 2010.
27. National Geographic Channel. Hibernation Medicine. Jan 7, 2010.
28. KREM 2 News. Hibernation and heart disease- update on WSU research. September 2009.
29. Scientific American. 10 Lessons Medicine Can Learn From Bears. Jan 6, 2009.
30. Pulse of the Planet Science Diaries, Northwest Public Radio. Four audio programs pertaining to grizzly biology, March 1, 2009.

31. Science News Magazine. Hibernation Science. December 13, 2007.
32. Echo Chief Online Magazine. Hibernating bears and echocardiography. January 24, 2007.
33. Alaska Daily News- Bear hibernation and WSU research program- August 6, 2006
34. Seattle Times, How hibernating bears can help humans. April 10, 2005
35. Good Morning America, How hibernating bears can help humans. April 22, 2005
36. World News Tonight, How hibernating bears can help humans. April 22, 2005
37. Animal Planet News Program, Hibernation- how do they do it? November 11, 2005
38. Animal Planet New Breed Vets with Steve Erwin, December 22, 2005
39. Seattle Times, How hibernating bears can help humans. December 22, 2005
40. Seattle Evening News Magazine, King TV. Reporting on grizzly bear hibernation research. November 24, 2004
41. Animal Planet Radio. Interview by Steve Dale. October 16, 2004.
42. Stable isotope results regarding cave bear food habits discussed in *Discover*, June 1997
43. Stable isotope results regarding the importance of brown bears to the movement of marine nutrients from spawning salmon into the terrestrial ecosystem review in *New Scientist*, September 1997

Abstracts and Posters from Bear Center Personnel:

Shine CL, Robbins CT, Nelson OL, CP McGowan. 2016. Grizzly bear joint loading across speeds: Sagittal and frontal plane analyses. Annual Meeting of the Society-for-Integrative-and-Comparative-Biology, Portland, OR, 2016

Pagano, AM, Rode KD, Cutting A, Owen MA, Jensen S, Ware JV, Robbins CT, Durner GM, Williams TM. 2016. Using tri-axial accelerometers to remotely identify ursid behavior. Annual Meeting of the Society-for-Integrative-and-Comparative-Biology, Portland, OR, 2016

Rigano KS, Gehring JL, Robbins CT, Nelson OL, Jansen HT. The naturally reversible state of insulin sensitivity in bears: cell autonomous and exogenous contributions. Keystone Conference, 2015.

Nelson OL, Robbins CT, Jansen HT, Fortin JK, Teisberg, J. Cardiac Responsiveness to Adrenergic Stimulus in Hibernating Bears. International Association for Bear Research and Management, Provo UT, Sept 15-20 2013.

Teisberg JE, Farley SD, Nelson OL, Hilerbrand GV, Madel MJ, Owen PA, Erlenbach JA, Robbins CT. Immobilization of Grizzly Bears with Dexmedetomidine, Tiletamine, and Zolazepam. International Association for Bear Research and Management, Provo UT, Sept 15-20 2013.

Bando MKH, Webster N, Nelson OL, Harlety C, Donaldson D, O'Dwyer J, Reynard, Bacon HJ. Aortic Aneurysms in Asiatic Black bears (*Ursus thibetanus*) Rescued From Bile farms in China. 45th Annual American Association fo Zoo Veterinarians, Provo UT, Sept 24-Oct 4 2013.

Rivet D, Nelson OL, Vella CA, Jansen HT, Robbins CT. Diets Higher in Polyunsaturated Fatty Acids May Yield Health Advantage for Bears – Preliminary Findings. International Association for Bear Research and Management, Provo UT, Sept 15-20 2013.

Jansen HT, Ware JV, Nelson OL, Teisberg J, Kasworm W, Dallmann R, Brown SA, Robbins CT, Fortin JK. Circadian Rhythms in Hibernating Bears – A Riddle, Wrapped in a Mystery, Surrounding a Function. International Association for Bear Research and Management, Provo UT, Sept 15-20 2013.

Jansen HT, Robbins CT, Nelson OL, Ware JV. Free-running activity rhythms in the hibernating brown (grizzly) bear (*Ursus arctos horribilis*): A clock for all seasons? Society for Research on Biological Rhythms (SRBR). Destin, Florida May 19-23, 2012

Jansen HT, Nelson OL, Robbins CT, Fortin J, Teisberg J, Ware JV. Entrainment of brown (grizzly) bear (*Ursus arctos horribilis*) activity rhythms by light and food. Society for Research on Biological Rhythms (SRBR). Destin, Florida May 19-23, 2012

Keen H, Nelson OL, Robbins CT, Newberry R. Application of a novel cognitive bias task for measuring the psychological value of enrichment. Proc. 13th Annual College of Veterinary Medicine Student Research Symposium, Pullman WA, Oct. 27, 2011

Keen H, Nelson OL, Robbins CT, Newberry R. Validation of a novel cognitive bias task for measuring the affective value of environmental enrichment. Proc. 10th International Conference on Environmental Enrichment, Portland OR, Aug. 14-19, 2011

Keen H, Nelson OL, Robbins CT, Newberry R. Application of a novel cognitive bias task for measuring the psychological value of enrichment. Proc. Association of Zoos and Aquariums 2011 Annual Conference, Atlanta GA. Sept. 12-17, 2011

Nelson OL, Wood RM, Robbins CT. Adiponectin: A cardioprotective role or a hibernation signal in grizzly bears (*Urus arctos horribilis*)? Keystone Symposia on Molecular and Cellular Biology- Metabolic Responses to Extreme Conditions. Big Sky MT, April 2011.

Jansen HT, Ware JV, Nelson OL, Robbins CT. Brain feeding peptide localization and central responsiveness to adipose signals in the brown bear during active and hibernating seasons. Keystone Symposia on Molecular and Cellular Biology- Metabolic Responses to Extreme Conditions. Big Sky MT, April 2011.

Jansen HT, Gaber J, Stark G, Ware JV, Nelson OL, Robbins CT. Distribution of Feeding-related and Reproductive Neuroendocrine peptides in the Grizzly Bear Brain. 20th International Conference on Bear Research & Management Ottawa, Ontario, Canada, July 2011.

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