Jay J. Cao, Ph.D.

Research Nutritionist
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EDUCATION:

1998	Univ of Florida, Gainesville, FL	Ph.D.	Animal Nutrition
1994	McGill Univ, Montreal, Canada	M.Sc.	Animal Nutrition
1988	Chinese Academy of Agricultural Sciences	M.Sc.	Animal Nutrition
1985	Nanjing Agricultural Univ, China	B.S.	Animal Science

WORKING EXPERIENCE:

2006 –	Research Nutritionist, Lead Scientist of "Bone Metabolism in Obesity" CRIS Unit USDA ARS Grand Forks Human Nutrition Research Center
2003 – 2012	Consultant, American Soybean Association
2005 – 2006	Nutritional Scientist Manager, Melaleuca, Inc., Idaho Falls, ID
2004 – 2005	Research Endocrinologist, Northern California Institute for Research and Education, San Francisco, CA
2001 – 2004	Postdoc in bone biology, Univ of California at San Francisco
1998 – 2001	Postdoc in mineral nutrition, Univ of Florida, Gainesville, FL

PROFESSIONAL SERVICES:

Variable	Ad Hoc manuscript reviewer for over 30 journals
Variable	Ad Hock Grant reviewer for over 6 funding agencies

Editorial Board Member for 7 journals
As a board member or an officer for several professional societies

ACTIVE PROFESSIONAL MEMBERSHIPS:

International Chinese Hard Tissue Society
American Society for Nutrition
American Society for Bone and Mineral Research
North America Chinese Society for Nutrition
Gamma Sigma Delta (Honorary Agricultural Research Society)
Sigma Xi (Honorary Scientific Research Society)

FUNDING SUPPORT:

USDA ARS (Appropriated, 5450-51000-039-00D); Food Factor to Prevent Obesity and Related Diseases; 04/2015 - 4/2020

USDA ARS (Appropriated, 5450-51000-039-00D); Bone Metabolism in Obesity; 04/2010 - 4/2015

USDA ARS (Appropriated, 5450-51000-039-00D); Mineral Intakes for Optimal Bone Health; 10/2006 - 4/2010

North Dakota Beef Commission; Effects of high meat weight loss diets on bone health; 10/2007 – 6/2009; $25,000

Northarvest Bean Growers Association; High selenium pinto beans as a value-added product in bone metabolism; 7/2007 – 3/2009; $27,072

Northarvest Bean Growers Association; Antioxidant activity in dry beans – potential for pinto beans to slow age-related bone loss; 7/2007 – 12/2008; $22,743

National Cattlemen's Beef Association; Calcium retention in postmenopausal women as influenced by beef and other dietary components that induce an acid load; 10/2007 – 9/2008; $156,312

INVITED TALKS, NATIONAL AND INTERNATIONAL CONFERENCE PRESENTATIONS:

More than 20

PROFESSIONAL TRAINING AND EDUCATION:

Protection of Human Research Subjects
Collaborative INSTITUTIONAL Training Initiative
New scientist training
Internship Cultural Awareness Workshop,
Clinical Research Monitoring Workshop for Site Coordinators, Monitors, and Auditors.
Protection of Human Research Subjects and Collaborative IRB Training Initiative
Supervisor Development Program, Melaleuca, Inc., Idaho Falls, ID
Interpersonal Communication and Presentation Skills.

PUBLICATIONS

Peer-reviewed (Animal work)

1 Kim SD, Cheng YS, **Cao JJ**, Wei HJ, Wang YC. 1990. Analysis of Chemical Composition of Muskrat (*Ondatra zibethica L.*) meat. *J Fur Anim* 48: 15 – 17.

2 **Cao JJ,** Jiang CS, Tong YR, Pan JR. 1991. The effects of dietary selenium levels on tissue selenium concentrations and fur quality of mink (*Neovison vison*). *Acta Zoonutrimenta Sinica* 2: 10 – 14.

3 **Cao JJ,** Chavez ER. 1995. The effects of low dietary copper intake during pregnancy on physiological fluids and reproductive performance of first-litter gilts. *J Trace Elem Med Biol* 9: 18 – 27.

4 Gao XH, Yang FH, **Cao JJ**, Kim SD, Kim DZ, Zhang XW, Wu JX, Wang XW. 1995. The effects of protein and energy levels on growth performance of two-year old male Sika Deer. (*Cervus Nippon Temminck*) meat. *Special Wild Economic Animal and Plant Research* 3: 15 – 19.

5 **Cao JJ,** Chavez ER. 1995. Comparative trace mineral nutritional balance of first-litter gilts under two dietary levels of copper intake. *J Trace Elem Med Biol* 9: 102 – 11.

6 **Cao JJ**, Luo XG, Henry PR, Ammerman CB, Littell RC, Miles RD. 1996. Effect of dietary iron concentration, age, and length of iron feeding on feed intake and tissue iron concentration of broiler chicks for use as a bioassay of supplemental iron sources. *Poultry Sci* 75: 495 – 504.

7 **Cao JJ**, Henry PR, Ammerman CB, Miles RD, Littell RC. 2000. Relative bioavailability of basic zinc sulfate and basic zinc chloride for chicks. *J Appl Poultry Res* 9: 513 – 517.

8 **Cao JJ**, Henry PR, Guo R, Holwerda RA, Toth JP, Littell RC, Miles RD, Ammerman CB. 2000. Chemical characteristics and relative bioavailability of supplemental organic zinc sources for poultry and ruminants. *J Anim Sci* 78: 2039 – 2054.

9 **Cao JJ**, Liuzzi JP, Bobo JA, Cousins RJ. 2001. Effects of intracellular zinc depletion on metallothionein and ZIP2 transporter expression and apoptosis. *J Leukoc Biol* 70:559 – 66.

10 Guo R, Henry PR, Holwerda RA, **Cao JJ**, Littell RC, Miles RD, Ammerman CB. 2001. Chemical characteristics and relative bioavailability of supplemental organic copper sources for poultry. *J Anim Sci* 79: 1132 – 1141.

11 **Cao JJ**, Henry PR, Davis SR, Cousins RJ, Miles RD, Littell RC, Ammerman CB. 2002. Relative bioavailability of organic zinc sources based on tissue zinc and metallothionein in chicks fed conventional dietary zinc concentrations. *Anim Feed Sci Technol* 101: 161 – 170.

12 Halloran BP, Uden P, Duh QY, Kikuchi S, Wieder T, **Cao JJ**, Clark O. 2002. Parathyroid gland volume increases with postmaturational aging in the rat. *Am J Physiol Endocrinol Metab* 282:E557 – 63.

13 **Cao JJ**, Luo XG, Davis SR, Henry PR, Cousins RJ, Miles RD, Ammerman CB. 2003. Tissue zinc and metallothionein expression as criteria for relative bioavailability assays of zinc sources in chicks. *Acta Veterina et Zootechnica Sinica.* 34: 227 – 231.

14 **Cao JJ**, Venton L, Sakata T, Halloran BP. 2003. Expression of RANKL and OPG correlates with age-related bone loss in male C57BL/6 mice. *J Bone Miner Res* 18: 270 – 277.

15 Cousins RJ, Blanchard RK, Popp MP, Liu L, **Cao JJ**, Moore JB, Green CL. 2003. A global view of the selectivity of zinc deprivation and excess on genes expressed in human THP 1 mononuclear cells. *Proc Natl Acad Sci* 100: 6952 – 6957.

16 Cousins RJ, Blanchard RK, Moore JB, Cui L, Green CL. Liuzzi JP, **Cao J**, Bobo JA. 2003. Regulation of zinc metabolism and genomic outcomes. *J Nutr* 133: 1521S – 1526S. (Review)

17 Sakata T, Wang YM, Halloran BP, Elaieh HZ, **Cao JJ**, Bikle DD. 2004. Skeletal unloading induces resistance to insulin-like growth factor-I (IGF-I) by inhibiting activation of the IGF-I signaling pathways. *J Bone Miner Res* 19: 436 – 446.

18 **Cao JJ**, Wronski TJ, Iwaniec U, Phleger L, Kurimoto P, Boudignon B, Halloran BP. 2005. Aging increases stromal/osteoblastic cell-induced osteoclastogenesis and alters the osteoclast precursor pool in the mouse. *J Bone Miner Res* 20: 1659 – 1668.

19 **Cao JJ**, Singleton PA, Majumdar S, Boudignon B, Burghardt A, Kurimoto P, Wronski TJ, Bourguignon LYW, Halloran BP. 2005. Hyaluronan increases RANKL expression in bone marrow stromal cells through CD44. *J Bone Min Res* 20: 30 – 40.

20 **Cao JJ**, Kurimoto P, Boudignon B, Rosen C, Lima F, Halloran BP. 2007. Aging impairs IGF-I receptor activation and induces skeletal resistance to IGF-I. *J Bone Miner Res* 22: 1271 – 1279.

21 **Cao JJ**, Gregoire BR, Gao, H. 2009. High-fat diet decreases cancellous bone mass but has no effect on cortical bone mass in the tibia in mice. *Bone* 44: 1097 – 1104.

22 Shen CL, Yeh JK, **Cao JJ**, Wang JS. 2009. Green tea and bone metabolism. *Nutr Res* 29: 437-456. (Review)

23 **Cao JJ**. 2010. Effects of obesity on bone metabolism. *J Orthopaedic Surgery and Research. 6: 30*. (Review)

24 Yan C, **Cao JJ**, Wu M, Zhang W, Jiang T, Yoshimura A, Gao H. 2010. Suppressor of cytokine signaling 3 inhibits LPS-induced IL-6 expression in osteoblasts by suppressing CCAAT/enhancer-binding protein beta activity. *J Bio Chem. 285: 37227-39*.

25 Shen CL, Yeh JK, **Cao JJ**, Tatum OL, Dagda RY, Wang JS. 2010. Synergistic effects of green tea polyphenols and alphacalcidol on chronic inflammation-induced bone loss in female rats. *Osteoporosis Int* 11: 1841-1852.

26 Shen CL, Yeh JK, **Cao JJ**, Tatum OL, Dagda RY, Wang JS. 2010. Green tea polyphenols mitigate bone loss of female rats in a chronic inflammation-induced bone loss model. *J Nutr Biochem 10: 968-974.*

27 **Cao JJ**, Sun, L, Gao H. 2010. Diet-induced obesity alters bone remodeling leading to decreased femoral trabecular bone mass in mice. *Ann New York Acad Sci* 1192: 292-297.

28 **Cao JJ**, Gregoire BR, Sheng XM, Liuzzi JP. 2010. Pinto bean hull extract supplementation favorably affects markers of bone metabolism and bone structure in mice. *Food Research International* 43: 560-566.

29 Shen CL, Yeh JK, **Cao JJ**, Chyu MC, Wang JS. 2011. Green tea and bone health: Evidence from laboratory studies. *Pharmacol Res* 64: 155-161. (Review)

30 Tang H, Yan C, **Cao JJ**, Sarma V, Haura EB, Wu M, Gao H. 2011. An essential role for Stat3 in regulating IgG immune complex-induced pulmonary inflammation. *FASEB J* 25: 4292-4300.

31 Shen CL, **Cao JJ**, Dagda RY, Tenner TE, Chyu MC, Yeh JK. 2011. Supplementation of green tea polyphenols improves bone microstructure and quality in aged, orchidectomized rats. *Calcif Tissue Int. 88(6): 455-463*.

32 Shen CL, Samathanam C, Tatum OL, Graham S, Tubb C, **Cao JJ**, Dunn DM, Wang JS. 2011. Green tea polyphenols avert chronic inflammation-induced myocardial fibrosis of female rats. *Inflamm Res* 60: 665-672.

33 Shen CL, Yeh JK, Samathanam C, **Cao JJ**, Stoecker BJ, Dagda RY, Chyu MC, Dunn DM, Wang JS. 2010. Protective actions of green tea polyphenols and alfacalcidol on bone microarchitecture in female rats with chronic inflammation. *J Nutr Biochem 22 (7): 673-680*.

34 Shen CL, Yeh JK, Samathanam C, **Cao JJ**, Stoecker BJ, Dagda RY, Chyu MC, Dunn DM, Wang JS. 2011. Green tea polyphenols attenuate deterioration of bone microarchitecture in female rats with systemic chronic inflammation. *Osteoporosis Int 22:327-337.*

35 Zhu LL, **Cao JJ**, Sun M, Yuen T, Zhou R, Li J, Yuan ZP, Moonga SS, Guo L, Mechanick JI, Igbal J, Bian Z, Blair HC, Liu P, Zaidi M. 2012. Vitamin C prevents hypogonadal bone loss. *PLoS One* 7: e47058.

36 Baliram R, Sun L, **Cao JJ**, Latif R, Huber AK, Blair HC, Zaidi M, Davies TF. 2012. Hyperthyroid-associated osteoporosis is exacerbated by the loss of TSH signaling. *J Clin Invest* 122: 3737-3741.

37 Colaianni G, Sun L, Di Benedetto A, Tamma R, Zhu LL, **Cao JJ**, Grano M, Yuen T, Colucci S, Cuscito C, Mancini L, Li J, Nishimori K, Bab I, Lee HJ, Iqbal J, Young WS 3rd, Rosen C, Zallone A, Zaidi M. 2012. Bone marrow oxytocin mediates the anabolic action of estrogen on the skeleton.*J Biol Chem*. 287: 29159-29167.

38 Jackson MI, **Cao JJ**, Zeng H, Uthus E, Combs GF. 2012. S-adenomethionine dependent protein methylation is reguired for expression of selenoprotein P and gluconeogenic enzymes in human hepatocytes. *J Biol Chem* 287: 36455-36464.

39 Shen CL, Cao JJ, Dagda RY, Chanjaplammootil S, Lu C, Chyu MC, Gao W, Wang JS, Yeh JK. 2012. Green tea polyphenols benefits body composition and improves bone quality in long-term high-fat diet-induced obese rats. *Nutr Res* 32: 448-457.

40 Zhu LL, Blair H, **Cao JJ**, Yuen T, Latif R, Guo L, Tourkova IL, Li J, Davies TF, Sun L, Bian Z, Rosen C, Zallone A, New MI, Zaidi M. 2012. Blocking antibody to the beta-subnit of FSH prevents bone loss by inhibiting bone resorption and stimulating systhesis. *Proc Natl Acd Sci*. 109: 14574-9.

41 **Cao JJ**, Gregoire BR, Zeng H. 2012. Selenium deficiency decreases antioxidant capacity and is detrimental to bone microarchitecture in mice. *J Nutr* 142: 1526-1531.

42 Yan C, Wang X, **Cao JJ**, Wu M, Gao HW. 2012. CCAAT/Enhancer-binding protein gamma is a critical regulator of IL-1 beta-induced IL-6 production in alveolar epithelial cells. *PLoS One*. 7: e35492.

43 Yan C, Wu M, **Cao JJ**, Tang H, Zhu M, Johnson PF, Gao H. 2012. Critical role for CCAAT/enhancer-binding protein beta in immune complex-induced acute lung injury. *J Immunol.* 89: 1480-1490.

44 **Cao, JJ**, Gregoire BR, Sun L, Song SH. 2012. Alpha-1 antitrypsin reduces ovariectomy-induced bone loss in mice. *Ann New York Acad Sci* 1240 (1): E31-35.

45 Shen CL, **Cao JJ**, Dagda RY, Chanjaplammootil S, Lu C, Chyu MC, Gao W, Wang JS, Yeh JK. 2011. Green tea polyphenols modifies body composition and improves bone health in long-term high-fat-diet-induced obese rats. *Nutr Res* 32: 448-457.

46 Iqbal J, Zhu L, **Cao JJ**, Colaianni G, Yuen T, Sun M, Li J, Peng Y, George B, Liu P, Bian Z, Mechanick JI, Narla G, Buettner C, Zallone A, Sun L, Zaidi M. 2012. Bone protective actions of EGFR and PARP inhibitors and vitamin C revealed by genomic connectivity mapping.

47 Iqbal J, Sun L, **Cao JJ**, Yuen T, Bab I, Leu N, Wagage S, Hunter C, Nebert DW, Zaidi M. 2013. Smoke carcinogens cause bone loss through the aryl hydrocarbon receptor and induction of CYP1 enzymes. *Proc Natl Acd Sci*.110: 11115-20.

48 Chen JR, Zhang J, Lazarenko OP, **Cao JJ**, Blackburn ML, Badger TM, Ronis MJ. 2013. Soy protein isolates prevent loss of bone quantity associated with obesity in rats through regulation of insulin signaling in osteoblasts. *FASEB J.* 27: 3514-23.

49 Yang S, Li YP, Liu T, He X, Yuan X, Li C, **Cao JJ**, Kim Y. 2013. Mx1-Cre mediated Rgs12 conditional knockout mice exhibit increased bone mass phenotype. *Genesis.* 51:201-9.

50 Yan L, Yee JA, **Cao JJ**. 2013. Curcumin reduces trabecular and cortical bone in naïve and Lewis lung carcinoma-bearing mice. *Anticancer Research*. 33: 3153-3162.

51 Qin W, Sun L, **Cao JJ**, Peng Y, Wu Y, Creasey G, Li J, Qin Y, Jarvis J, Bauman WA, Zaidi M, Cardozo C. 2013. The CNS-independent anti-bone resorptive activity of muscle contraction and the underlying molecular and cellular signatures. *J Biol Chem.* 288:13511-21.

52 Shen CL, Chyu MC, **Cao JJ**, Yeh JK. 2013. Green tea polyphenols improve bone microarchitecture in high-fat-diet-induced obese female rats through suppressing bone formation and erosion. *J Med Food*. 16:421-7.

53 Zeng H, **Cao JJ**, Combs Jr. GF. 2013. Selenium in bone health: Roles in antioxidant protection and cell proliferation. *Nutrients* 5: 97-110. (Review)

54 Pan G, **Cao JJ**, Ding K, Yang N, Ding K, Fan C, Xiong WC, Hamrick M, Isales CM, Shi XM. Role of glucocorticoid-induced Leucine zipper (GILZ) in bone acquisition. 2014. *J Biol Chem*. In Press.

55 **Cao JJ** and Picklo MJ. 2014. N-acetylcysteine supplementation decreases osteoclast differentiation and increases bone mass in mice fed a high-fat diet. *J Nutr* 144: 289-296.

56 Gaffney-Stomberg E, **Cao JJ**, Lin GG, Wulff CR, Murphy NE, Young AJ, McClung JP, Pasiakos SM. 2014. Differential effects of dietary protein level and source on bone turnover, density and structure and intestinal calcium transporter expression during energy restriction in rats. 144: 821-829.

57 **Cao JJ** and Picklo MJ. 2014. Involuntary wheel running decreases adiposity, improves but does not fully protect against negative skeletal effects of obesity induced by a high-fat diet in rats. *Ready to be submitted*. xxx.

58 **Cao JJ** and Gregoire BR. 2014. Increased circulating estradiol in mice fed a high-fat diet does not attenuate ovariectomy-induced bone structural deterioration. *Ready to be submitted*. xxx.

Peer-reviewed (Human work)

59 **Cao JJ** Cousins RJ. 2000. Metallothionein mRNA in monocytes and peripheral blood mononuclear cells and in cells from dried blood spots increases after zinc supplementation of human. *J Nutr* 130: 2180 – 2187.

60 **Cao JJ**, Nielsen FN. 2010. Acid diet (high-meat protein) effects on calcium metabolism and bone health. *Curr Opin Clin Nutr Metab Care. 13: 698-702*. (Review)

61 **Cao JJ**, Hunt JR, Johnson LK. 2011. A diet high in meat protein and potential renal acid load increases absorption and urinary excretion of calcium, without affecting markers of bone resorption or formation in postmenopausal women. *J Nutr 141 (3): 391-397*.

62 Pasiakos SM, Margolis LM, McClung JP, **Cao JJ**, Whigham LD, Combs Jr. GF, Young AJ. 2013. Whole-body protein turnover response to short-term high protein diets during weight loss: a randomized controlled trial. *International J Obesity*. 1-4.

63 **Cao JJ**, Pasiakos SM, Margolis LM, Sauter ER, Whigham LD, McClung JP, Young AJ, Combs GF Jr. 2014. Calcium homeostasis and bone metabolic responses to high protein, energy deficit diets in healthy young adults: a randomized control trial. *Am J Clin Nutr*. 99 (2): 400-407.

64 Carbone JW, Margolis LM, McClung JP, **Cao JJ**, Murphy NE, Sauter ER, Combs, GF Jr., Young AJ, Pasiakos SM. 2013 Effects of energy deficit, dietary protein, and feeding on intracellular regulators of skeletal muscle proteolysis. *FASEB J*. 27:5104-5111.

65 Pasiakos SM, **Cao JJ**, Margolis LM, Sauter ER, Whigham LD, McClung JP, Rood JC, Combs Jr. GF, Young AJ. 2013. Effects of high protein diets on fat-free mass and muscle protein synthesis following weight loss: a randomized controlled trial. *FASEB J*. 27:3837-47.

66 Karl JP, Thompson LA, Niro PJ, Margolis LM, McClung JP, **Cao JJ**, Combs GF Jr, Young AJ, Lieberman HR, Pasiakos SM. 2014. Short-term energy deficit impairs mood, but not cognitive performance or sleep, independent of dietary protein-to-carbohydrate ratio in non-obese young adults. *Submitted to Physiology & Behavior*.

Other publications:

67 **Cao JJ.** 1995. Copper nutrition in first-litter gilts. (*M.Sc. Thesis, McGill University, Canada*).

68 **Cao JJ.** 1998. Characterization of organic zinc sources and their relative bioavailabilities for poultry and sheep. (*Ph.D. Dissertation, University of Florida, Gainesville, FL*).

69 **Cao JJ.** 2007. Build healthy bones with physical activity. Grand Forks Herald (Newspaper article).
70 **Cao JJ.** 2008. Connecting the dots: from obesity to osteoporosis. Grand Forks Herald (Newspaper article).
71 **Cao JJ.** 2009. The Role of Protein in Bone Health. Grand Forks Herald (Newspaper article).
72 **Cao JJ.** 2010. Women's Bone Health: Beyond Calcium and Vitamin D. Grand Forks Herald (Newspaper article).
73 **Cao JJ.** 2011. Phytonutrients are good for bone health. Grand Forks Herald (Newspaper article).
74 **Cao JJ.** 2012. MyPlate: Good for Your Bones. Grand Forks Herald (Newspaper article).