

Larry J. Suva, PhD.



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Overview of Research and Teaching Philosophy

The development, control and diseases of the musculoskeletal system have been my scholarly interests for the past 30+ years. Understanding how the musculoskeletal system adapts and progresses throughout life is the basis of my expertise. My research focus has been the skeletal consequences of disease, such as breast cancer bone metastasis and multiple myeloma, osteosarcoma chemotherapy, fracture healing, osteoporosis, diabetes and bone infections. Current research efforts include a focus on in vivo models (murine and larger animals) to discover regulatory pathways fundamental to bone physiology and the development of rare bone disease pre-clinical model(s) that may provide novel insight into future therapeutic directions. A critical aspect of my academic philosophy is an open door policy and the importance of one-on-one interactions. We must strive to provide training and exposure for our students as they prepare for careers both in and out of academic medicine and research. I emphatically believe that these teaching and mentoring experiences have shaped my scientific career and have helped mold my teaching and mentoring philosophy of placing the best professional, academic, social and personal development of faculty, students and staff above all else.

Education

B. App. Sci. Swinburne Institute of Technology, Melbourne, Australia (Chemistry/Biochemistry)
Ph.D. University of Melbourne, Australia (Medicine)

Professional and Academic Appointments

- 1989-1992 Post-doctoral fellow, Department of Bone Biology and Osteoporosis Research, Merck Research Laboratories, West Point, PA
- 1992-1998 Research Associate-in-Medicine, Beth Israel Deaconess Medical Center, Assistant Professor of Medicine, Harvard Medical School
- 1998-2000 Adjunct Assistant Professor of Medicine, Harvard Medical School
- 1998-2000 Associate Director, Bone and Cartilage Biology, GlaxoSmithKline, King of Prussia, PA
- 2000-2015 Associate Professor and Professor, Departments of Orthopaedic Surgery and Physiology and Biophysics, University of Arkansas for Medical Sciences
- 2000-2015 Director, Center for Orthopaedic Research, University of Arkansas for Medical Sciences
- 2015- Professor, Texas A&M University, College of Veterinary Medicine, College Station Texas, Department of Veterinary Physiology and Pharmacology

Honors and Awards:

American Society for Bone and Mineral Research (ASBMR), International Young Investigator of the Year

Red Sash Medical School Teaching Award, UAMS

13th Annual John G. Haddad, Jr. Memorial Lecture, University of Pennsylvania

7th Annual Howard Florey Lecture, University of Adelaide, Australia

Selected Publications (in peer-reviewed journals)

1. **Suva LJ**, Winslow GA, Wettenhall REH, Hammonds GG, Moseley JM, Diefenbach-Jagger H, Rodda CP, Kemp BE, Rodriguez H, Chen EY, Hudson PJ, Martin TJ and Wood WI. A parathyroid hormone-related protein implicated in malignant hypercalcemia: cloning and expression. *Science*. **237**:893-896, 1987.
2. Moseley JM, Kubota M, Diefenbach-Jagger H, Wettenhall REH, Kemp BE, **Suva LJ**, Rodda CP, Ebeling PR, Hudson PJ, Zajac JD and Martin TJ. Parathyroid hormone-related protein purified from a human lung cancer cell line. *Proc. Natl. Acad. Sci. (U.S.A.)*. **84**:5048-5052, 1987.
3. Zhou AT, Bessalle R, Bisello A, Nakamoto C, Rosenblatt M, **Suva LJ**, and Chorev M. Direct mapping of an agonist-binding domain within the parathyroid hormone/parathyroid hormone-related protein receptor by photoaffinity labeling. *PNAS* **94**:3644-3649, 1997.
4. Nuttall ME, Fisher PW, **Suva LJ**, and Gowen M. The selective oestrogen receptor modulators idoxifene and raloxifene have fundamentally different cell-specific oestrogen-response element (ERE)-dependent/independent mechanisms *in vitro*. *European Journal of Cancer* **36**: S59-S67, 2000.

5. Bennett CN, Longo KA, Wright WS, **Suva LJ**, Lane TF, Hankenson KD and MacDougald, OA. Regulation of osteoblastogenesis and bone mass by Wnt10b. Proc. Natl. Acad. Sci. (U.S.A.). **102**:3324-3329, 2005. PMID:15728361 PMCID:PMC552924
6. Perrien DS, Achenbach SJ, Bledsoe SE, Walser B, **Suva LJ**, Khosla S, and Gaddy D. Bone Turnover Across the Menopause Transition: Correlations with Inhibins and FSH. J Clin Endocrinol Metab **91**:1848-54, 2006 [Epub January 31, 2006]
7. **Suva LJ**. PTH Expression, Not Always where You Think J. Clin. Endocrinol. Metab. **2**:396-7, 2006.
8. Perrien DS, Akel NS, Dupont-Versteegden EE, Skinner RA, Siegel ER, **Suva LJ**, and Gaddy D. Aging Alters the Skeletal Response to Disuse in the Rat. Am J Physiol Regul Integr Comp Physiol. **292**:R988-96, 2007 [Epub 2006 Oct 26; 2006].
9. Perrien DS, Akel NS, Edwards PK, Carver AA, Bendre MS, Swain FL, Skinner RA, Hogue WR, Nicks KM, Pierson TM, **Suva LJ**, and Gaddy D. Inhibin A is an Endocrine Stimulator of Bone Mass and Strength. Endocrinology. **148**:1654-65, 2007. [Epub 2006 Dec 28] PMID: 17194739.
10. **Suva LJ**, Hartman E, Dilley JD, Russell S, Akel NS, Skinner RA, Hogue WR, Budde U, Varughese KI, Kanaji T, Ware J. Platelet Dysfunction and a High Bone Mass Phenotype in a Murine Model of Platelet-Type von Willebrand Disease. Am J Path. **172**:430-439 2008 [Epub 2008 Jan 10] PMID: 18187573.
11. Bhattacharyya S, Siegel ER, Achenbach SJ, Khosla S **Suva LJ**. A Serum Biomarker Profile Associated with High Bone Turnover and Bone Mineral Density in Postmenopausal Women. J Bone Miner Res. **23**:1106-17, 2008 [Epub 2008 Feb 26] PMID: 18302502.
12. Coleman RE, Lipton A, Roodman GD, Guise TA, Boyce BF, Brufsky AM, Clézardin P, Croucher PI, Gralow JR, Hadji P, Holen I, Mundy GR, Smith MR, **Suva LJ**. Metastasis and bone loss: Advancing treatment and prevention. Cancer Treat Rev. **36**:615-20, 2010 [Epub 2010 May 15.] PMID: 20478658
13. **Suva LJ**, Washam C, Nicholas RW, Griffin RJ. Bone metastasis: mechanisms and therapeutic opportunities. Nat Rev Endocrinol. **7**:208-218. 2011. [Epub 2011 Jan 4] PMID: 21200394
14. Ware J **Suva LJ**. Platelets to hemostasis and beyond. Blood **117**:3703-04, 2011 PMID: 21474678
15. **Suva LJ**, Brander BE, Makhoul I. Cancer: Update on bone-modifying agents in metastatic breast cancer. Nat Rev Endocrinol. **7**:380-381, 2011 [Epub 2011 May 24] PMID: 21610686

16. Perrien DS, Nicks KM, Liu L, Akel NS, Bacon AW, Skinner RA, Swain FL, Aronson J, **Suva LJ**, Gaddy D. Inhibin A enhances bone formation during distraction osteogenesis. *J Orthop Res.* **2**:288-95, 2012 [Epub 2011 Aug 1] PMID: 21809377
17. **Suva LJ**, Griffin RJ. The irradiation of bone: Old idea, new insight. *J Bone Miner Res.* **4**:747-8, 2012 [Epub March 22.] PMID: 22434644
18. McKelvey KD, Fowler TW, Akel NS, Kelsay JA, Gaddy D, Wenger GR, **Suva LJ**. Low bone turnover and low bone density in a cohort of adults with Down syndrome. *Osteoporos Int.* **24**(4):1333-8, 2013. [Epub 2012 Aug 18] PMID:22903293. PMCID:PMC3606288
19. Fowler TW, McKelvey KD, Akel NS, Vander Schilden J, Bacon AW, Bracey JW, Sowder T, Skinner RA, Swain FL, Hogue WR, Leblanc D, Gaddy D, Wenger GR, and **Suva LJ**. Low bone turnover and low BMD in Down Syndrome: Effect of Intermittent PTH treatment *PLoS One* 2012 **7**:e42967. [Epub Aug 14 2012] PMID:22916188. PMCID:PMC3419249
20. Kamalakar A, Bendre MS, Washam CL, Fowler TW, Carver A, Dilley JD, Bracey JW, Akel NS, Margulies AG, Skinner RA, Swain FL, Hogue WR, Montgomery CO, Lahiji P, Maher JJ, Leitzel KE, Ali SM, Lipton A, Nicholas RW, Gaddy D, **Suva LJ**. Circulating Interleukin-8 levels explain breast cancer osteolysis in mice and humans. *Bone.* 2014 **61**:176-85. [Epub Jan 28, 2014] PMID:24486955. NIHMS 561803 PMCID: PMC3967592
21. **Suva LJ**, Makhoul I. Will breast cancer chemoprevention stand on 'solid bone'? *Nat Rev Endocrinol.* **11**:138-9, 2015 [Epub Dec 16, 2014] PMID: 25511313 PMCID: PMC4334702
22. Fowler TW, Kamalakar A, Akel NS, Kurten RC, **Suva LJ**, Gaddy D. Activin A inhibits RANKL-mediated osteoclast formation, movement and function in murine bone marrow macrophage cultures. *J Cell Sci.* **128**:683-94, 2015 [Epub Jan 20, 2015] PMID: 25609708 PMCID: PMC4327386
23. Makhoul I, Montgomery CO, Gaddy D, **Suva LJ**. The best of both worlds-managing the cancer, saving the bone. *Nat Rev Endocrinol.* **1**:29-42, 2016 [Epub Oct27, 2015] PMID: 26503674

Complete List of peer-reviewed Published Work can be found at:

<http://www.ncbi.nlm.nih.gov/pubmed/?term=suva+L>

Patents

1. 433D1-United States Patent. 07/216,678 Method and compositions for making ACSF and ACSF antagonists (Application serial No. 07/252,013)

2. United States patent application. Calcilytic compounds, United States patent 7,186,517
3. Compositions and methods for monitoring breast cancer treatment. 10/972,834 Anti Interleukin 8 therapy for tumor osteolysis
4. United States patent application Filed April 2009. 11/332,702 Tears as a screening medium
5. United States patent application Filed September 2010, Breast cancer diagnostic using PTHrP(12-48)

Current Funding

2011-2016 1 R01 CA151538-01 *Heparanase regulation of osteolysis in multiple myeloma*. The major goal of this project is to determine the role of heparanase in promoting osteolytic bone disease that occurs in myeloma and other cancers and further validate the use of heparanase inhibitors as anti-cancer drugs. Role: Co-PI

2012-2017 R01 AR060823 *Role of the Leprecan genes in skeletal formation*. This application is focused on determining the contribution of Sc65, a member of the Leprecan family of proteins, to collagen post-translational modification, folding, intracellular trafficking and secretion of collagen I trimers in the development of osteogenesis imperfect (OI). Role: Co-I

2013-2018 R01 CA166060 *Breast cancer bone metastasis*. The long-term goal of our research is to understand and predict the progression of bone metastasis. These studies will provide important new information on the specific involvement and biological function of IL-8 and the novel circulating biomarker PTHrP (12-48) in breast cancer bone metastases. Role: PI

2015-2020 R01 AI119380 *Impact of Staphylococcus aureus in osteomyelitis and bone physiology*. This application is focused on identifying the mechanisms of *S. aureus* activation of host bone cells. Role: Co-I

2016-2021 R01 DK105811 *Hormonal Regulation of NHERF1 in Bone*. This application is focused on understanding the control of bone mass and strength by the GPCR adaptor protein NHERF1. Role Co-I

2016-2021 R01 AA018282 *The role of oxidative stress in alcohol-induced osteopenia*. This application will ascertain the mechanisms by which anti-oxidants prevent alcohol related bone loss which may provide fundamental insights into the molecular pathways controlling bone growth and turnover. Role Co-I