



Joy Wu

Associate Professor of Medicine (Endocrinology)
Medicine - Endocrinology, Gerontology, & Metabolism

CLINICAL OFFICES

- **Endocrine Clinic within Ambulatory Care Clinic**

300 Pasteur Dr Rm A175

Stanford, CA 94305

Tel (650) 721-1300

Fax (650) 498-5823

Bio

BIO

Dr. Joy Wu is a board-certified endocrinologist with over 12 years' experience who specializes in treating women and men with osteoporosis and other bone and mineral diseases, including primary hyperparathyroidism, vitamin D deficiency, Paget's disease and fibrous dysplasia. She has a special interest in optimizing skeletal health for those at risk of bone loss from glucocorticoid treatment, cancer therapies, or organ transplant. She works closely with each individual and his/her referring physician to assess fracture risk, and to develop a tailored treatment and monitoring plan.

Dr. Wu directs a broad basic and translational research program that focuses on skeletal development and the bone marrow hematopoietic niche. Her laboratory is currently studying stem cell therapies for bone formation, and the prevention of cancer metastases to bone (joywulab.stanford.edu). She has been honored with awards from the NIH Director's New Innovator Award, the Endocrine Society, the American Society for Bone and Mineral Research, and the Mary Kay Foundation. Dr. Wu is committed to training the next generation of physician scientists, and serves as Co-Director of the Stanford Internal Medicine Translational Investigator Program.

CLINICAL FOCUS

- Osteoporosis
- Metabolic Bone Disease
- Endocrinology
- Diabetes and Metabolism

ACADEMIC APPOINTMENTS

- Associate Professor, Medicine - Endocrinology, Gerontology, & Metabolism
- Member, Bio-X
- Member, Maternal & Child Health Research Institute (MCHRI)
- Member, Stanford Cancer Institute

ADMINISTRATIVE APPOINTMENTS

- Vice Chair, Basic Science, Department of Medicine, (2020- present)

- Associate Member, Stanford Diabetes Research Center, (2018- present)
- Co-Director, Translational Investigator Program, Department of Medicine, (2015- present)

HONORS AND AWARDS

- Faculty Women's Forum Allyship Award, Stanford University (2021)
- Alford Distinguished Lecture, Baylor College of Medicine (2019)
- Cancer Grant Recipient, The Mary Kay Foundation (2013)
- NIH Director's New Innovator Award, NIH (2011)
- Claflin Distinguished Scholar Award, Massachusetts General Hospital (2009)
- Clinical Scientist Program Instructor Development Award, Harvard Stem Cell Institute (2009)
- John Haddad Young Investigator Award, Advances in Mineral Metabolism (2008)
- Merck Senior Fellow Award, The Endocrine Society (2007)
- Endocrine Scholars Award, The Endocrine Society (2006)
- Young Investigator Award, American Society for Bone and Mineral Research Annual Meeting (2006)
- Alpha Omega Alpha, Duke University School of Medicine (1997)
- Marsden Memorial Award in Chemistry, Stanford University (1993)
- Phi Beta Kappa, Stanford University (1993)

BOARDS, ADVISORY COMMITTEES, PROFESSIONAL ORGANIZATIONS

- Member, Skeletal Biology Development and Disease Study Section, NIH (2020 - present)
- Basic Science Seat, Board of Directors, The Endocrine Society (2019 - present)
- Leadership Task Force, The Endocrine Society (2015 - 2015)
- Board of Directors, Advances in Mineral Metabolism (2013 - 2016)
- Membership Enhancement Committee, The American Society for Bone and Mineral Research (2013 - 2016)
- Co-Chair, Trainee & Career Development Core Committee, The Endocrine Society (2007 - 2010)
- Ex Officio, Council, The Endocrine Society (2006 - 2010)
- Member, The American Society for Bone and Mineral Research (2005 - present)
- Member, The Endocrine Society (2003 - present)

PROFESSIONAL EDUCATION

- Board Certification: Endocrinology, Diabetes and Metabolism, American Board of Internal Medicine (2006)
- Fellowship: Massachusetts General Hospital (2006) MA
- Residency: Brigham and Women's Hospital Harvard Medical School (2003) MA
- Medical Education: Duke University School of Medicine (2001) NC
- MD/PhD, Duke University (2001)

LINKS

- Joy Wu Lab: <http://joywulab.stanford.edu/>
- Stanford Osteoporosis Clinic: <http://stanfordhospital.org/osteoporosis>
- Division of Endocrinology: <http://endocrinology.stanford.edu/>
- Stanford Translational Investigator Program: <http://medicine.stanford.edu/residency/translational-investigator-program.html>
- Department of Medicine: <http://medicine.stanford.edu/>

- Stanford Immunology: <http://immunol.stanford.edu/>
- Stanford Cancer Institute: <http://cancer.stanford.edu/>
- Stanford MSTP: <http://mstp.stanford.edu/>

Research & Scholarship

CURRENT RESEARCH AND SCHOLARLY INTERESTS

Osteoporosis, a disease of fragile bones resulting in fractures, will strike 50% of women and 25% of men. As a physician scientist, my laboratory is studying stem cells in the skeleton and bone marrow to develop novel regenerative approaches to increase bone quality and strength. We are also interested in how the skeleton supports hematopoiesis, and how diseases and medications that impact bone may affect blood cell production and cancer metastasis. For more detailed descriptions of ongoing research projects in the lab, visit our website at joywulab.stanford.edu.

CLINICAL TRIALS

- Pilot Trial of Zoledronic Acid to Prevent Bone Loss in Hematopoietic Cell Transplant Recipients, Not Recruiting

Teaching

STANFORD ADVISEES

Doctoral Dissertation Reader (AC)

Amy Fan

GRADUATE AND FELLOWSHIP PROGRAM AFFILIATIONS

- Immunology (Phd Program)

Publications

PUBLICATIONS

- **Direct reprogramming of mouse fibroblasts into functional osteoblasts.** *Journal of bone and mineral research : the official journal of the American Society for Bone and Mineral Research*
Zhu, H., Swami, S., Yang, P., Shapiro, F., Wu, J.
2019
- **Pluripotent stem cells as a source of osteoblasts for bone tissue regeneration** *BIOMATERIALS*
Zhu, H., Kimura, T., Swami, S., Wu, J. Y.
2019; 196: 31–45
- **Older Men with Anemia Have Increased Fracture Risk Independent of Bone Mineral Density.** *journal of clinical endocrinology and metabolism*
Valderrábano, R. J., Lee, J., Lui, L., Hoffman, A. R., Cummings, S. R., Orwoll, E. S., Wu, J. Y.
2017
- **Bone Density Loss Is Associated With Blood Cell Counts** *JOURNAL OF BONE AND MINERAL RESEARCH*
Valderrabano, R. J., Lui, L., Lee, J., Cummings, S. R., Orwoll, E. S., Hoffman, A. R., Wu, J. Y.
2017; 32 (2): 212-220
- **In vivo rescue of the hematopoietic niche by pluripotent stem cell complementation of defective osteoblast compartments.** *Stem cells (Dayton, Ohio)*
Chubb, R. n., Oh, J. n., Riley, A. K., Kimura, T. n., Wu, S. M., Wu, J. Y.
2017
- **Prevention of breast cancer skeletal metastases with parathyroid hormone.** *JCI insight*
Swami, S. n., Johnson, J. n., Bettinson, L. A., Kimura, T. n., Zhu, H. n., Albertelli, M. A., Johnson, R. W., Wu, J. Y.
2017; 2 (17)

- **Loss of Gsa in the Postnatal Skeleton Leads to Low Bone Mass and a Blunted Response to Anabolic Parathyroid Hormone Therapy.** *journal of biological chemistry*
Sinha, P., Aarnisalo, P., Chubb, R., Poulton, I. J., Guo, J., Nachtrab, G., Kimura, T., Swami, S., Saeed, H., Chen, M., Weinstein, L. S., Schipani, E., Sims, et al
2016; 291 (4): 1631-1642
- **PTH Signaling in Osteoprogenitors Is Essential for B-Lymphocyte Differentiation and Mobilization.** *Journal of bone and mineral research*
Panaroni, C., Fulzele, K., Saini, V., Chubb, R., Pajevic, P. D., Wu, J. Y.
2015; 30 (12): 2273-2286
- **Wnts produced by Osterix-expressing osteolineage cells regulate their proliferation and differentiation.** *Proceedings of the National Academy of Sciences of the United States of America*
Tan, S. H., Senarath-Yapa, K., Chung, M. T., Longaker, M. T., Wu, J. Y., Nusse, R.
2014; 111 (49): E5262-71
- **Loss of G(s)alpha Early in the Osteoblast Lineage Favors Adipogenic Differentiation of Mesenchymal Progenitors and Committed Osteoblast Precursors** *JOURNAL OF BONE AND MINERAL RESEARCH*
Sinha, P., Aarnisalo, P., Chubb, R., Ono, N., Fulzele, K., Selig, M., Saeed, H., Chen, M., Weinstein, L. S., Pajevic, P. D., Kronenberg, H. M., Wu, J. Y.
2014; 29 (11): 2414-2426
- **Teriparatide (PTH1-34) Treatment Increases Peripheral Hematopoietic Stem Cells in Postmenopausal Women** *JOURNAL OF BONE AND MINERAL RESEARCH*
Yu, E. W., Kumbhani, R., Siwila-Sackman, E., DeLelys, M., Preffer, F. I., Leder, B. Z., Wu, J. Y.
2014; 29 (6): 1380-1386
- **Histopathology of osteogenesis imperfecta bone. Supramolecular assessment of cells and matrices in the context of woven and lamellar bone formation using light, polarization and ultrastructural microscopy.** *Bone reports*
Shapiro, F., Maguire, K., Swami, S., Zhu, H., Flynn, E., Wang, J., Wu, J. Y.
2021; 14: 100734
- **The characterization of distinct populations of murine skeletal cells that have different roles in B lymphopoiesis.** *Blood*
Green, A. C., Tjin, G. n., Lee, S. C., Chalk, A. M., Straszkowski, L. n., Kwang, D. n., Baker, E. K., Quach, J. M., Kimura, T. n., Wu, J. n., Purton, L. E.
2021
- **Finding My Voice.** *Annals of internal medicine*
Wu, J. Y.
2021
- **Increased NF-kappa B Activity in Osteoprogenitor-Lineage Cells Impairs the Balance of Bone Versus Fat in the Marrow of Skeletally Mature Mice** *REGENERATIVE ENGINEERING AND TRANSLATIONAL MEDICINE*
Lin, T., Pajarinen, J., Kohno, Y., Nabeshima, A., Lu, L., Nathan, K., Yao, Z., Wu, J. Y., Goodman, S.
2020; 6 (1): 69-77
- **Induction of Osteoblasts by Direct Reprogramming of Mouse Fibroblasts.** *Methods in molecular biology (Clifton, N.J.)*
Zhu, H. n., Wu, J. Y.
2020; 2155: 201-12
- **Calcinosis is associated with ischemic manifestations and increased disability in patients with systemic sclerosis.** *Seminars in arthritis and rheumatism*
Valenzuela, A. n., Baron, M. n., Rodriguez-Reyna, T. S., Proudman, S. n., Khanna, D. n., Young, A. n., Hinchcliff, M. n., Steen, V. n., Gordon, J. n., Hsu, V. n., Castelino, F. V., Schoenfeld, S. n., Li, et al
2020; 50 (5): 891-96
- **Wnt Activation and Reduced Cell-Cell Contact Synergistically Induce Massive Expansion of Functional Human iPSC-Derived Cardiomyocytes.** *Cell stem cell*
Buikema, J. W., Lee, S. n., Goodyer, W. R., Maas, R. G., Chirikian, O. n., Li, G. n., Miao, Y. n., Paige, S. L., Lee, D. n., Wu, H. n., Paik, D. T., Rhee, S. n., Tian, et al
2020; 27 (1): 50-63.e5
- **Bone Health Management After Hematopoietic Cell Transplantation: An Expert Panel Opinion from the American Society for Transplantation and Cellular Therapy.** *Biology of blood and marrow transplantation : journal of the American Society for Blood and Marrow Transplantation*
Bar, M. n., Ott, S. M., Lewiecki, E. M., Sarafoglou, K. n., Wu, J. Y., Thompson, M. J., Vaux, J. J., Dean, D. R., Saag, K. G., Hashmi, S. K., Inamoto, Y. n., Dholaria, B. R., Kharfan-Dabaja, et al

2020

- **Preconditioned or IL4-Secreting Mesenchymal Stem Cells Enhanced Osteogenesis at Different Stages** *TISSUE ENGINEERING PART A*
Lin, T., Kohno, Y., Huang, J., Romero-Lopez, M., Maruyama, M., Ueno, M., Pajarinen, J., Nathan, K., Yao, Z., Yang, F., Wu, J. Y., Goodman, S. B.
2019
- **Association of bone mineral density with hemoglobin and change in hemoglobin among older men and women: The Cardiovascular Health Study** *BONE*
Valderrabano, R. J., Buzkova, P., Chang, P., Zakai, N. A., Fink, H. A., Robbins, J. A., Lee, J. S., Wu, J. Y., Cardiovasc Hlth Study Grp
2019; 120: 321–26
- **Mesenchymal lineage cells and their importance in B lymphocyte niches** *BONE*
Green, A. C., Rudolph-Stringer, V., Chantry, A. D., Wu, J. Y., Purton, L. E.
2019; 119: 42–56
- **Woven bone overview: structural classification based on its integral role in developmental, repair and pathological bone formation throughout vertebrate groups.** *European cells & materials*
Shapiro, F. n., Wu, J. Y.
2019; 38: 137–67
- **Constitutive stimulatory G protein activity in limb mesenchyme impairs bone growth.** *Bone*
Karaca, A. n., Malladi, V. R., Zhu, Y. n., Tafaj, O. n., Paltrinieri, E. n., Wu, J. Y., He, Q. n., Bastepe, M. n.
2018; 110: 230–37
- **Bone and blood interactions in human health and disease.** *Bone*
Valderrábano, R. J., Wu, J. Y.
2018
- **Foxp3(+) regulatory T cells maintain the bone marrow microenvironment for B cell lymphopoiesis** *NATURE COMMUNICATIONS*
Pierini, A., Nishikii, H., Baker, J., Kimura, T., Kwon, H., Pan, Y., Chen, Y., Alvarez, M., Strober, W., Velardi, A., Shizuru, J. A., Wu, J. Y., Chiba, et al
2017; 8
- **Gs alpha Controls Cortical Bone Quality by Regulating Osteoclast Differentiation via cAMP/PKA and beta-Catenin Pathways** *SCIENTIFIC REPORTS*
Ramaswamy, G., Kim, H., Zhang, D., Lounev, V., Wu, J. Y., Choi, Y., Kaplan, F. S., Pignolo, R. J., Shore, E. M.
2017; 7
- **Parathyroid Hormone Directs Bone Marrow Mesenchymal Cell Fate.** *Cell metabolism*
Fan, Y., Hanai, J., Le, P. T., Bi, R., Maridas, D., DeMambro, V., Figueroa, C. A., Kir, S., Zhou, X., Mannstadt, M., Baron, R., Bronson, R. T., Horowitz, et al
2017
- **Evidence for use of Teriparatide in Spinal Fusion Surgery in Osteoporotic Patients.** *World neurosurgery*
Chaudhary, N., Lee, J. S., Wu, J. Y., Tharin, S.
2016
- **Calcinosis is associated with digital ulcers and osteoporosis in patients with systemic sclerosis: A Scleroderma Clinical Trials Consortium study** *SEMINARS IN ARTHRITIS AND RHEUMATISM*
Valenzuela, A., Baron, M., Herrick, A. L., Proudman, S., Stevens, W., Rodriguez-Reyna, T. S., Vacca, A., Medsger, T. A., Hinchcliff, M., Hsu, V., Wu, J. Y., Fiorentino, D., Chung, et al
2016; 46 (3): 344-349
- **SIKs control osteocyte responses to parathyroid hormone** *NATURE COMMUNICATIONS*
Wein, M. N., Liang, Y., Goransson, O., Sundberg, T. B., Wang, J., Williams, E. A., O'Meara, M. J., Govea, N., Beqo, B., Nishimori, S., Nagano, K., Brooks, D. J., Martins, et al
2016; 7
- **Induction of LIFR confers a dormancy phenotype in breast cancer cells disseminated to the, bone marrow** *NATURE CELL BIOLOGY*
Johnson, R. W., Fingers, E. C., Olcina, M. M., Vilalta, M., Aguilera, T., Miao, Y., Merkel, A. R., Johnson, J. R., Sterling, J. A., Wu, J. Y., Giaccia, A. J.
2016; 18 (10): 1078-1089
- **Bone Marrow Hematopoietic Niches** *OSTEOIMMUNOLOGY: INTERACTIONS OF THE IMMUNE AND SKELETAL SYSTEMS, 2ND EDITION*
Wu, J. Y., Kronenberg, H. M., Lorenzo, J., Horowitz, M. C., Choi, Y., Takayanagi, H., Schett, G.
2016: 103–19

- **Pluripotent Stem Cells and Skeletal Regeneration-Promise and Potential** *CURRENT OSTEOPOROSIS REPORTS*
Wu, J. Y.
2015; 13 (5): 342-350
- **RAR gamma is a negative regulator of osteoclastogenesis** *JOURNAL OF STEROID BIOCHEMISTRY AND MOLECULAR BIOLOGY*
Green, A. C., Poulton, I. J., Vrahnas, C., Haeusler, K. D., Walkley, C. R., Wu, J. Y., Martin, T. J., Gillespie, M. T., Chandraratna, R. A., Quinn, J. M., Sims, N. A., Purton, L. E.
2015; 150: 46-53
- **Activation of the Wnt/Planar Cell Polarity Pathway Is Required for Pericyte Recruitment during Pulmonary Angiogenesis.** *American journal of pathology*
Yuan, K., Orcholski, M. E., Panaroni, C., Shuffle, E. M., Huang, N. F., Jiang, X., Tian, W., Vldar, E. K., Wang, L., Nicolls, M. R., Wu, J. Y., de Jesus Perez, V. A.
2015; 185 (1): 69-84
- **Specific bone cells produce DLL4 to generate thymus-seeding progenitors from bone marrow.** *The Journal of experimental medicine*
Yu, V. W., Saez, B. n., Cook, C. n., Lotinun, S. n., Pardo-Saganta, A. n., Wang, Y. H., Lymperi, S. n., Ferraro, F. n., Raaijmakers, M. H., Wu, J. Y., Zhou, L. n., Rajagopal, J. n., Kronenberg, et al
2015
- **The PTH-G alpha(s)-Protein Kinase A Cascade Controls alpha NAC Localization To Regulate Bone Mass** *MOLECULAR AND CELLULAR BIOLOGY*
Pellicelli, M., Miller, J. A., Arabian, A., Gauthier, C., Akhouayri, O., Wu, J. Y., Kronenberg, H. M., St-Arnaud, R.
2014; 34 (9): 1622-1633
- **Mesenchymal progenitors and the osteoblast lineage in bone marrow hematopoietic niches.** *Current osteoporosis reports*
Panaroni, C., Tzeng, Y., Saeed, H., Wu, J. Y.
2014; 12 (1): 22-32
- **Differential regulation of myeloid leukemias by the bone marrow microenvironment.** *Nature medicine*
Krause, D. S., Fulzele, K., Catic, A., Sun, C. C., Dombkowski, D., Hurley, M. P., Lezeau, S., Attar, E., Wu, J. Y., Lin, H. Y., Divieti-Pajevic, P., Hasserjian, R. P., Schipani, et al
2013; 19 (11): 1513-1517
- **Interactions between B lymphocytes and the osteoblast lineage in bone marrow.** *Calcified tissue international*
Panaroni, C., Wu, J. Y.
2013; 93 (3): 261-268
- **Myelopoiesis is regulated by osteocytes through Gsa-dependent signaling.** *Blood*
Fulzele, K., Krause, D. S., Panaroni, C., Saini, V., Barry, K. J., Liu, X., Lotinun, S., Baron, R., Bonewald, L., Feng, J. Q., Chen, M., Weinstein, L. S., Wu, et al
2013; 121 (6): 930-939
- **Development of the skeleton** *Osteoporosis, 4th Edition*
Provot, S., Schipani, E., Wu, J. Y., Kronenberg, H. M.
Academic Press.2013: 97-126
- **G(s)alpha enhances commitment of mesenchymal progenitors to the osteoblast lineage but restrains osteoblast differentiation in mice** *JOURNAL OF CLINICAL INVESTIGATION*
Wu, J. Y., Aarnisalo, P., Bastepe, M., Sinha, P., Fulzele, K., Selig, M. K., Chen, M., Poulton, I. J., Purton, L. E., Sims, N. A., Weinstein, L. S., Kronenberg, H. M.
2011; 121 (9): 3492-3504
- **Potent constitutive cyclic AMP-generating activity of XL alpha s implicates this imprinted GNAS product in the pathogenesis of McCune-Albright Syndrome and fibrous dysplasia of bone** *BONE*
Mariot, V., Wu, J. Y., Aydin, C., Mantovani, G., Mahon, M. J., Linglart, A., Bastepe, M.
2011; 48 (2): 312-320
- **The role of bone cells in establishing the hematopoietic stem cell niche** *Osteoimmunology: Interactions of the Immune and Skeletal Systems*
Wu, J. Y., Kronenberg, H. M.
2011: 81-99
- **Clarifying the contributions of distinct mesenchymal populations in supporting hematopoiesis [editorial]** *IBMS BoneKEy*
Wu, J. Y.
2010; 7: 369-372

- **Role of the Osteoblast Lineage in the Bone Marrow Hematopoietic Niches** *JOURNAL OF BONE AND MINERAL RESEARCH*
Wu, J. Y., Scadden, D. T., Kronenberg, H. M.
2009; 24 (5): 759-764
- **Osteoblastic regulation of B lymphopoiesis is mediated by G(s)alpha-dependent signaling pathways** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
Wu, J. Y., Purton, L. E., Rodda, S. J., Chen, M., Weinstein, L. S., McMahon, A. P., Scadden, D. T., Kronenberg, H. M.
2008; 105 (44): 16976-16981
- **Development of the Skeleton** *Osteoporosis, 3rd Edition*
Provot, S., Schipani, E., Wu, J. Y., Kronenberg, H. M.
Academic Press.2008: 241–269
- **Spermatogenesis and the regulation of Ca²⁺-calmodulin-dependent protein kinase IV localization are not dependent on caldesmon** *MOLECULAR AND CELLULAR BIOLOGY*
Wu, J. Y., Ribar, T. J., Means, A. R.
2001; 21 (17): 6066-6070
- **Female fertility is reduced in mice lacking Ca²⁺ calmodulin-dependent protein kinase IV** *ENDOCRINOLOGY*
Wu, J. Y., Gonzalez-Robayna, I. J., Richards, J. S., Means, A. R.
2000; 141 (12): 4777-4783
- **Spermiogenesis and exchange of basic nuclear proteins are impaired in male germ cells lacking Camk4** *NATURE GENETICS*
Wu, J. Y., Ribar, T. J., Cummings, D. E., Burton, K. A., McKnight, G. S., Means, A. R.
2000; 25 (4): 448-452
- **Ca²⁺/calmodulin-dependent protein kinase IV is expressed in spermatids and targeted to chromatin and the nuclear matrix** *JOURNAL OF BIOLOGICAL CHEMISTRY*
Wu, J. Y., Means, A. R.
2000; 275 (11): 7994-7999
- **Pharmacology** *Crashing the boards: a user friendly study guide for the USMLE step 1*
Wu, J. Y.
Lippincott Williams and Wilkins.1999; 2: 31–47