## Curriculum Vitae

## Joseph Paul Stains, Ph.D.

Professor of Orthopaedics

University of Maryland School of Medicine

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**Contact Information**

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**Education**

1990-1994 B.S., Molecular & Cell Biology, The Pennsylvania State University, University Park, PA.

1996-2000 Ph.D., Biochemistry, Microbiology and Molecular Biology, The Pennsylvania State University, University Park, PA.

Thesis Title: Characterization of Na+/Ca2+ exchanger in osteoblasts and investigation into its role in mineralization.

Thesis Advisor: Carol Gay, Ph.D.

Post Graduate Education and Training

2001-2004 Postdoctoral Fellow, Division of Bone & Mineral Diseases, Washington University, St Louis, MO.

Advisor: Roberto Civitelli, M.D.

Employment History

Academic Appointments

2004-2013 Assistant Professor, University of Maryland School of Medicine, Baltimore, MD

Department of Orthopaedics

2010-present Secondary Appointment in the Department of Physiology, University of Maryland School of Medicine, Baltimore, MD

2013-2020 Associate Professor, Tenured, University of Maryland School of Medicine, Baltimore, MD, Department of Orthopaedics

2020-present Professor, Tenured, University of Maryland School of Medicine, Baltimore, MD, Department of Orthopaedics

Other Appointments

2020-present Director of Research, Musculoskeletal Research Division, University of Maryland School of Medicine, Baltimore, MD, Department of Orthopaedics

2008-2020 Interim Director of Research, Musculoskeletal Research Labs, University of Maryland School of Medicine, Baltimore, MD, Department of Orthopaedics

2010-present Faculty Member of the Molecular Medicine Program of the Graduate Program in Life Sciences (GPILS), University of Maryland School of Medicine, Baltimore, MD

2010-2011 Associate Member on the Graduate Faculty of the University of Maryland Graduate School

2012-present Regular Member on the Graduate Faculty of the University of Maryland Graduate School

2013-present Faculty Member of the Center for Stem Cell Biology and Regenerative Medicine, University of Maryland School of Medicine, Baltimore, MD

2017-present Faculty Member of the Center for Research on Aging, University of Maryland School of Medicine, Baltimore, MD

2017-present External Member of the Center for Research on Biomedical Engineering and Technology (BioMET), University of Maryland School of Medicine, Baltimore, MD

Other Employment

1994 Research Assistant, The Pennsylvania State University, University Park, PA, Laboratory of Teh-hui Kao, Ph.D.

1994-1995 Research Technologist, The Pennsylvania State University, University Park, PA, Laboratory of Carol Gay, Ph.D.

Professional Society Memberships

2001-present American Society for Bone and Mineral Research

2002-present American Society for Cell Biology

2008-present Orthopaedic Research Society

2009-2016 International Bone and Mineral Society

2018-present American Association for the Advancement of Science

2018-present American Aging Association

2018-present Biophysical Society

Honors and Awards

1992-1994 National Institute of Health Research Experience for Undergraduates Grant

1996 NASA Space Grant: Biochemistry and Molecular Biology Fellowship

1999-2000 NASA Space Grant Fellowship

2001-2004 Supported by Institutional NIH Training Grant (5T32AR007033)

2003 Travel Award to the International Gap Junction Conference

2005 Top 25 most downloaded articles in BBRC of the year [PMID: 15694406]

2006 Certificate of Recognition as a Mentor for the Sumer Research Training Program, UMB

2011 Research Preceptor of the Year, Department of Medical and Research Technology, University of Maryland School of Medicine

2013 Mentor for a Short-term Research Training Program (SRTP) for Medical Students, Awarded to Richard Chen

2013-2016 Mentor for a Ruth L. Kirschstein National Research Service Awards for Individual Predoctoral Fellowships to Promote Diversity in Health-Related Research, Awarded to Atum Buo (F31 AR064673)

2015-2016 University System of Maryland's PROMISE AGEP Outstanding Faculty Mentor

2016 Top 11 most cited articles in Calcified Tissue International for 2014-2015 [PMID: 23754488]

2016 Awarded “APSselect Distinction in Scholarship” award for our manuscript [PMID: 27605453]

2020 Fellow of the American Society for Bone and Mineral Research

**Administrative Service**

**Institutional Service**

2004-2006 Orthopaedics Basic Science Faculty Search Committee, University of Maryland School of Medicine

2004-present Orthopaedic Residency Program Interviewer, University of Maryland School of Medicine

2007-2008 Dean’s Science Advisory Council, Alternate, University of Maryland School of Medicine

2008-2015 Member, School of Medicine Council, University of Maryland School of Medicine

2008-2016 Emergency Warden, University of Maryland School of Medicine

2009 Discussion Group Moderator, Presenting Your Research Workshop, Office of Research Career Development, University of Maryland School of Medicine – 7 graduate students/ residents

2010-2016 Mentorship Committee for Eugene Koh, MD PhD

2010-2018 Medical Student Applicant Interviewer, University of Maryland School of Medicine

2011 Physiology Seminar Committee, Department of Physiology, University of Maryland School of Medicine

2012 Panel Member, Scientific Leadership & Project Management seminar series, *Preparing for An Academic Job Search*, Office of Post-doctoral Scholars, University of Maryland, School of Medicine, 27 participants (students, fellows and junior faculty)

2013 Molecular Medicine Faculty Representative on the Graduate Program in Life Sciences Award Committee

2013-2018 Molecular Medicine Applicant Interview Committee, Graduate Program in Life Sciences, University of Maryland School of Medicine

2013-present Group Leader, Center for Stem Cell Biology & Regenerative Medicine Skeletal Working Group, University of Maryland School of Medicine

2014-present Executive Committee, Department of Orthopaedics, University of Maryland School of Medicine

2014-present Mentorship Committee for Mohit Gilotra, MD

2015-2016 Orthopaedics Basic Science Faculty Search Committee, University of Maryland School of Medicine

2015, 2016 Panelist, Scientific Strategies to Build Your Research Program Panel, Leadership & Professional Development Symposium, University of Maryland School of Medicine, 70 participants (students, fellows and junior faculty)

2016 Panelist, Maryland Stem Cell Research Fund (MSCRF) Information Session/Breakfast, University of Maryland School of Medicine, 75 participants (students, fellows and junior faculty)

2016 Oral Session Judge, Molecular Medicine Research Retreat, University of Maryland School of Medicine

2017 Oral Session Judge, 39th Annual Graduate Research Conference, University of Maryland School of Medicine

2017 co-Chair of Study Section for the University of Maryland Research and Innovation Seed Grant Program

2017 Member, Scientific Misconduct Investigation Committee, University of Maryland School of Medicine

2017-2020 Member, Graduate Council for the University of Maryland, Baltimore and University of Maryland, Baltimore County

2018 Oral Session Judge, 40th Annual Graduate Research Conference, University of Maryland School of Medicine

2018 Chair, New Courses Committee, Graduate Council for the University of Maryland, Baltimore and University of Maryland, Baltimore County

2018-present Mentorship Committee for Satoru Otsuru, Ph.D.

2019 Presenter, Tips for Writing a Standard Scientific Research Paper: Scientific Writing Seminar Series, University of Maryland School of Medicine

2020 Panelist, Writing with Others”: Scholarly Research & Writing Workshop, Presidents Student Leadership Institute, University of Maryland, Baltimore.

2020 Panelist, “Methods and Results” Scientific Writing Class, University of Maryland, Baltimore

**Local and National Service**

2004-present Ad Hoc Journal Reviewer: *Aging Cell; Journal of Biological Chemistry*; *BBA: Biomembranes*; *Bone*; *Calcified Tissue International*; *Cells, Tissues, Organs*; *Cell and Tissue Research;* *genesis; The Journal of Genetics and Development; Transgenic Research*; *Trends in Biotechnology*; *Journal of Cellular Biochemistry;* *Journal of Molecular Medicine; Journal of Orthopedic Research;* *Molecular and Cellular Biology*; *BMC Biomembranes;* *Journal of Bone and Mineral Research;* *PLoS One;* *Osteoarthritis & Cartilage;* *Bone Research; Journal of Physiobiochemical Metabolism; Arthritis Research and Therapy;* *International Journal of Biochemistry and Cell Biology; Trends in Endocrinology and Metabolism; Journal of Cellular Physiology; FASEB Journal; Mechanisms of Development; BMC Biotechnology; Cellular Physiology and Biochemistry; Journal of Biomechanics; Connective Tissue Research; Cellular Signaling; BMC Musculoskeletal Disorders; Journal of Bone and Mineral Metabolism; Gut Microbes; Biochemical Journal*; *Cell Death and Disease; Development.*

2011 Poster Chair, Bone, Cartilage and Connective Tissue Matrix & Development Section, American Society for Bone and Mineral Research Annual Meeting

2011 President's Poster Competition Judge, American Society for Bone and Mineral Research Annual Meeting

2012 President's Poster Competition Judge, American Society for Bone and Mineral Research Annual Meeting

2012 Ad Hoc Reviewer, Arthritis Foundation Post-doctoral Fellowship Grants

2012 Ad Hoc Reviewer, Mid-Atlantic NORC Pilot & Feasibility Program

2012 Ad Hoc Reviewer, Arthritis Foundation Innovative Research Grants

2013-2017 Editorial Board: *Journal of Bone and Mineral Research*

2013 Moderator, Workshop on Improved Characterization of Mesenchymal Stem Cells for Clinical Trials

2013 Basic Science Poster Tour Leader, American Society for Bone and Mineral Research Annual Meeting

2013 Ad Hoc Reviewer, Mid-Atlantic NORC Pilot & Feasibility Program

2013 Ad Hoc Reviewer, Arthritis Foundation Innovative Research Grants

2013 Ad Hoc Reviewer, Pennsylvania Department of Health, Master Tobacco Settlement Health Research Grants

2014-2015 Ad Hoc Reviewer, VA Merit Review Board, Rehabilitation Research and Development Service (RRD2) Study Sections

2014-2015 Abstract Reviewer: Osteoblast - Function, American Society for Bone and Mineral Research Annual Meeting

2015 Ad Hoc Reviewer, MOSS Study Section, NIH

2015 Panelist, Careers in Science Panel, 10th Annual NIDDK Scientific Conference, National Institutes of Health

2015 Ad Hoc Reviewer, Biotechnology and Biological Sciences Research Council (BBSRC) grants, UK

2015, 2016 Grant Reviewer, JHU-UMB Musculoskeletal Research Pilot & Feasibility Grants

2015-2016 Ad Hoc Reviewer, 2015 AΩA Carolyn L. Kuckein Student Research Fellowship applications

2015, 2017 Ad Hoc Reviewer, SBSR Study Sections, NIH

2016 Ad Hoc Reviewer, Washington University St Louis Musculoskeletal Research Center Pilot & Feasibility grants

2016 Ad Hoc Reviewer, SBDD Study Sections, NIH

2016-2019 Member, American Society for Bone and Mineral Research Finance Committee

2017-2021 Editorial Board: *Journal of Bone and Mineral Research*

2017-2021 Editorial Board: *JBMR Plus*

2018 Ad Hoc Reviewer, SBDD Study Sections, NIH

2018 Abstract Reviewer: Bone Interactions with Muscle and Other Tissues, American Society for Bone and Mineral Research Annual Meeting

2018 Discussant, 19th Annual Gemstone Honors Program Thesis Conference, Team MATRIX, University of Maryland, College Park

2018 Poster Session Judge, 47th Annual Meeting of the American Aging Association, Philadelphia, PA

2018 Ad Hoc Reviewer, Washington University St Louis Musculoskeletal Research Center Pilot & Feasibility grants

2018 ASBMR Mentoring Pilot Program, Robert Tower, Ph.D.

2018 ORS Mentor Match Program, Alex Reiter

2019 Ad Hoc Reviewer, SBDD and SBSR Study Sections, NIH

2019 K99/R01 Mentoring Committee, Karyn Jourdeuil, University of Maryland College Park

2020 Ad Hoc Reviewer, SBDD Study Section, NIH

2020-2024 Standing Member, SBDD Study Section, NIH

**Teaching Service**

**Mentored Students & Fellows**

2004-2006 Post-doctoral Fellow – Florence Lima, Ph.D.

2006 Medical Student Summer Researcher (3 mos) – Floyd D. Howell

2008 Medical Student Summer Researcher (3 mos) – Yu Kwan Chan

2008- 2009 Medical Student - Oliver Tannous

2008- 2009 Resident Research – Danielle Casagrande, M.D.

2009- 2010 Resident Research – Mohit Gilotra, M.D.

2005- 2012 Post-doctoral Fellow – Corinne Niger, Ph.D.

2010- 2010 Resident Research – Brian Duggan, M.D.

2007- 2011 Resident Research – Rishi R. Gupta, M.D.

2010-2011 DMRT, Undergraduate Student – Vy Ma

2011 DMRT, Undergraduate Student (6 mos) - Nadia Barreda

2012-2015 Post-doctoral Fellow – Shuo Liu, M.D., Ph.D.

2013 Medical Student Summer Researcher (3 mos) – Richard Chen

2013, 2014 Undergraduate Student Summer Researcher (3 mos each) – Eric Eidelman

2013, 2014, 2015 High School Student Summer Research (2 mos each) – Margaret Ren

2013-2014 Post-baccalaureate Student, Armel Silenou

2014 Undergraduate Student (3 mos), Zaid Naseer

2014, 2015 Undergraduate Student Summer Researcher (3 mos each) – Max Chason

2013-2016 Research Associate -Aditi Gupta, Ph.D.

2017-2019 Post-doctoral Fellow – Katrina Williams, Ph.D.

2019 High School Student Summer Research (Summer) – Paola Sorto Quijano

**Post-Graduate Medical Students**

2008- 2009 Brian Duggan, M.D.

2009- 2010 Sophia Leung, M.D.

2010- 2011 Cullen Griffith, M.D.

2010- 2011 David Jaffe, M.D.

2011- 2012 Thao Nguyen, M.D.

2012-2013 Astor Robertson, M.D.

2016-2017 Jim Lai, M.D.

**Graduate Students**

2010 Maria Luciotti, Molecular Medicine Graduate Program (M.S. degree)

2010-2017 Atum Buo, Molecular Medicine Graduate Program (Ph.D. candidate)

2014 Hidayah Anderson, Medical Research and Technology (M.S. degree)

2014-2018 Megan Moorer, Molecular Medicine Graduate Program (Ph.D. candidate)

2015-2017 James Lyons, Molecular Medicine Graduate Program (Ph.D. candidate)

2018 Saimai Chatree, Visiting Scholar, Thailand

2018-present Nicole Gould, Molecular Medicine Graduate Program (Ph.D. candidate)

2018-present Jenna Leser, Molecular Medicine Graduate Program (Ph.D. candidate)

**Rotating Graduate Students**

Apr 2010-May 2010 Atum Buo, Molecular Medicine Graduate Program

May 2010-Jun 2010 Maria Luciotti, Molecular Medicine Graduate Program

Jun 2014-Jul 2014 Megan Moorer, Molecular Medicine Graduate Program

Mar 2015-Jul 2015 James Lyons, Molecular Medicine Graduate Program

Jul 2018-Aug 2018 Andrew Coleman, Molecular Medicine Graduate Program

Dec 2017-Mar 2018 Nicole Gould, Molecular Medicine Graduate Program

Mar 2018-May 2018 Jenna Leser, Molecular Medicine Graduate Program

Jul 2019-Aug 2019 Makenzy Mull, Molecular Medicine Graduate Program

**Graduate Student Thesis and Exam Committees**

2007-2010 Ph.D. Thesis Committee member, Minjun Yu, Department of Microbiology & Immunology, University of Maryland School of Medicine

2010 Ph.D. Qualifying Exam Committee, Jessica Bennett, Molecular Medicine Graduate Program, University of Maryland School of Medicine

2010 M.S. Thesis Committee member, Maria Luciotti, Molecular Medicine Graduate Program, University of Maryland School of Medicine

2010-2017 Ph.D. Thesis Committee member, Atum Buo, Molecular Medicine Graduate Program, University of Maryland School of Medicine

2011 Ph.D. Qualifying Exam Committee, Marey Shriver, Molecular Medicine Graduate Program, University of Maryland School of Medicine

2011 Ph.D. Qualifying Exam Committee, Sarah Horvat, Molecular Medicine Graduate Program, University of Maryland School of Medicine

2011-2013 Ph.D. Thesis Committee member, Sarah Horvat-Morgan, Molecular Medicine Graduate Program, University of Maryland School of Medicine

2012 Ph.D. Qualifying Exam Committee, Katherine Kight, Graduate Program in Life Sciences, University of Maryland School of Medicine

2013 Ph.D. Qualifying Exam Committee, Katrina Williams, Graduate Program in Life Sciences, University of Maryland School of Medicine

2013-2017 Ph.D. Thesis Committee member, Katrina Williams, Graduate Program in Life Sciences, University of Maryland School of Medicine

2015 Ph.D. Qualifying Exam Committee, Amber Mueller, Molecular Medicine Graduate Program, University of Maryland School of Medicine

2015-2018 Ph.D. Thesis Committee member, Amber Mueller, Graduate Program in Life Sciences, University of Maryland School of Medicine

2015-2017 Ph.D. Thesis Committee member, Camilo Vanegas, Graduate Program in Life Sciences, University of Maryland School of Medicine

2015-2018 Ph.D. Thesis Committee member, Ji Young (Julie) Choi, Biological Sciences (MOCB) Program, University of Maryland College Park

2016 Ph.D. Qualifying Exam Committee, Manasa Srikanth, Molecular Medicine Graduate Program, University of Maryland School of Medicine

2016-2017 Ph.D. Thesis Committee member, James Lyons, Molecular Medicine Graduate Program, University of Maryland School of Medicine

2016-2018 Ph.D. Thesis Committee member, Megan Moorer, Molecular Medicine Graduate Program, University of Maryland School of Medicine

2016 Ph.D. Qualifying Exam Committee, Hanan Aljohani, PhD Program in Biomedical Sciences, University of Maryland School of Dentistry

2017 Ph.D. Thesis Exam Committee, Paxton Moon, Physiology and Pharmacology MD/Ph.D Program, University of Western Ontario

2018 Master’s Thesis Committee Chair, Kimberly Wilson, Department of Medical and Research Technology, University of Maryland School of Medicine

2018 Ph.D. Qualifying Exam Committee, Mohammed Al Qranei, PhD Program in Biomedical Sciences, University of Maryland School of Dentistry

2018 Ph.D. Qualifying Exam Committee, Vishnu-Prak Rao, Molecular Medicine Graduate Program, University of Maryland School of Medicine

2018 Ph.D. Qualifying Exam Committee, Andrew Coleman, Molecular Medicine Graduate Program, University of Maryland School of Medicine

2018 Ph.D. Qualifying Exam Committee, Pranjali Kanvinde, Molecular Medicine Graduate Program, University of Maryland School of Medicine

2018-2020 Ph.D. Thesis Committee member, Shashwati Bhattacharya, Lehigh University

2018 Ph.D. Qualifying Exam Committee, Kelly Rock, PTRS, University of Maryland School of Medicine

2016-2020 Ph.D. Thesis Committee Member, Hanan Aljohani, PhD Program in Biomedical Sciences, University of Maryland School of Dentistry

2018-2020 Ph.D. Thesis Committee Member, Mohammed Al Qranei, PhD Program in Biomedical Sciences, University of Maryland School of Dentistry

2020 Ph.D. Thesis Committee Member, Ivor Geoghegan, National University of Ireland, Galway

2020 Ph.D. Qualifying Exam Committee, Nicolas Verhoeven, Molecular Medicine Graduate Program, University of Maryland School of Medicine

2020-present Ph.D. Thesis Committee member, Jenna Leser, Molecular Medicine Graduate Program, University of Maryland School of Medicine

2020-present Ph.D. Thesis Committee member, Nicole Gould, Molecular Medicine Graduate Program, University of Maryland School of Medicine

2020-present Ph.D. Thesis Committee member, Sonia Garcia, Molecular Medicine Graduate Program, University of Maryland School of Medicine

**Courses**

Fall 1994 Introductory Microbiology Lab Undergraduate Course, Penn State

- 6 hours/week, ca. 25 undergraduate students, each class involved a lecture and lab practicum, additional ~6 hours/week prep time.

Spring 1996 Introductory Microbiology Lab Undergraduate Course, Penn State

- 6 hours/week, ca. 25 undergraduate students

Fall 1997 Genetics Lecture Recitation Undergraduate Course, Penn State

- 2 section; 6 hours/week; ca. 200 undergraduate students

Fall 2005-present Orthopaedics Residents Basic Science Lecture Series, University of Maryland School of Medicine; ~2-4 lectures per year, ca. 20 residents

Spring 2008 CIPP 907 - Research Ethics Discussion Group Leader, 1 discussion group, ca. 12 graduate students, University of Maryland School of Medicine

Spring 2009 Re-organized curriculum for Orthopaedics Residents Basic Science Lecture Series (8 lectures, split across two lecturers), Department of Orthopaedics, University of Maryland School of Medicine

Spring 2010 GPILS 645 – Cell and Systems Physiology Lecture (1 lecture, pre-quiz, and examination questions and grading), 15 graduate students

-1.5 hour lecture with ~8 hours prep time

Fall 2010 MEDT 423 - Applications in Biotechnology – Project Director for Vy Ma, an undergraduate student in DMRT, University of Maryland School of Medicine

-24 hours per week, 6 weeks, 1 student

Spring 2011 GPILS 645 – Cell and Systems Physiology Lecture (1 lecture, pre-quiz, and examination questions and grading), 14 graduate students

-1 hour per week for 8 weeks/semester with 4-8 hours prep time per lecture

Spring 2012 GPILS 645 – Cell and Systems Physiology Lecture (2 lectures, pre-quizzes, and examination questions and grading), 10 graduate students

-1.5 hour lectures with ~8 hours prep time each

Fall 2012 Orthopaedics Residents Basic Science Lecture Series, Union Memorial Hospital; Articular Cartilage and Osteoarthritis lecture, 12 residents

-1.5 hour lecture with ~8 hours prep time

Spring 2013 GPILS 645 – Cell and Systems Physiology Lecture (2 lectures, examination questions and grading), 5 graduate students

-1.5 hour lectures with ~4 hours prep time each

Spring 2014-present GPILS 645 – Cell and Systems Physiology, Course Director

10 graduate students (2014), 13 graduate students (2015), 6 graduate students (2016); 7 graduate students (2017); 25 graduate students (2018); 12 graduate students (2019); 15 graduate students (2020).

Fall 2018 Foundations of Rehabilitation Science I - Principles and Models, (1 lecture, examination questions and grading), 2 graduate students

Grant Support

Active

3/01/2018-2/28/2023 PI (25%) MPI Grant (Ward, co-PI)

“Mechanisms of osteocyte mechano-signaling and sclerostin regulation”

NIH/NIAMS R01 AR071614

Annual Direct Costs: $225,000

Total Direct Costs: $1,250,000

03/01/2013-2/28/2025 PI (30%)

“Spatial Control of Bone Remodeling by Gap Junction-Communicated cAMP”

NIH/NIAMS R01 AR063631

Annual Direct Costs: $225,000

Total Direct Costs: $1,250,000

Completed

4/01/2019-3/31/2020 PI (0%) MPI Grant (Riddle, co-PI)

“Microtubules and Mechanobiology in the Crosstalk of Bone and White Adipose Tissue”

Mid-Atlantic Nutrition Obesity Research Center Pilot & Feasibility Grant

Annual Direct Costs: $35,000

Total Direct Costs: $35,000

10/01/2016-9/30/2017 Co-I (0%)

“h-MSC Based Delivery of siRNAs to Chondrocytes and Synovial Tissue in a Rat Model”

Pilot and Feasibility (P&F) Grant from the Baltimore Center for Musculoskeletal Research

Annual Direct Costs: $30,000

Total Direct Costs: $30,000

10/01/2015-9/30/2016 Co-I (0%)

**“**Microtubule Dependent Mechanotransduction in Bone”

Pilot and Feasibility (P&F) Grant from the Baltimore Center for Musculoskeletal Research

Annual Direct Costs: $30,000

Total Direct Costs: $30,000

07/01/2013-06/30/2016 Co-I (15%)

“Optimal Treatment of Malignant Long Bone Fracture: Influence of Method of Repair and External Beam Irradiation on the Pathway and Efficacy of Fracture Healing”

DoD PR120168

Annual Direct Costs: $250,000; Sub-contract: ~$27,000

Total Direct Costs: $750,000; Sub-contract: $82,284

07/01/2014-06/30/2016 PI (10%)

“The Role of the beta-Catenin Signaling Cascade in the Skeletal Phenotype of Hutchinson Gilford Progeria Syndrome”

TEDCO/Maryland Stem Cell Research Fund, 2014-MSCRFE-0645

Annual Direct Costs: $100,000

Total Direct Costs: $250,000

7/01/2012-6/30/2014 PI (10%)

“Using Gap Junctions to Enhance Stem Cell Therapies in Osteoarthritis

TEDCO/MSCRF 2012-MSCRFE-0154-00

Annual Direct Costs: $99,742

Total Direct Costs: $199,488

5/01/2006-8/30/2011 PI (25%)

“Intercellular Signaling in Bone”

NIH/NIAMS R01 AR052719

Annual Direct Costs: $170,896

Total Direct Costs: $859,584

**Patents and Inventions**

1. James S. Lyons, **Joseph P. Stains**, Christopher W. Ward. “Multifunctional Fluid Flow Device” US Provisional Patent Number: 62/311,654 filed on March 22, 2016
2. **Joseph P. Stains**, Christopher W. Ward, James S. Lyons. “Methods for Modulating Microtubule-dependent Mechanotransduction in Treating Osteoporosis” US Provisional Patent Number: 62/422,717 filed on November 16, 2016
3. James S. Lyons, **Joseph P. Stains**, Christopher W. Ward. “Multifunctional Fluid Flow Device” US Patent Publication: US 2017/0276666 A1 published on September 28, 2017
4. **Joseph P. Stains**, Christopher W. Ward, James S. Lyons. “Methods for Modulating Microtubule-dependent Mechanotransduction in Treating Osteoporosis” International Patent Application: WO 2018/094059 A1 published on May 24, 2018

**Publications**

Peer-Reviewed Journal Articles

1. Mu J-H, Stains JP, Kao T-h (1994) Characterization of a pollen-expressed gene encoding a putative pectin esterase in *Petunia inflata*. Plant Mol Biol 25:539-544.
2. Stains JP, Gay CV (1998) Asymmetric distribution of functional sodium-calcium exchanger in primary osteoblasts. J Bone Miner Res 13: 1862-1869.
3. Stains JP, Gay CV (2001) Inhibition of Na+/Ca2+ exchange with KB-R7943 or bepridil diminishes mineral deposition by osteoblasts. J Bone Miner Res 16: 1434-1443.
4. Stains JP, Weber JA, Gay CV (2001) Expression of Na+/Ca2+ exchanger isoforms (NCX1 and NCX3) and plasma membrane Ca2+ ATPase during osteoblast differentiation. J Cell Biochem 84:625-635.
5. Baldridge D, Lecanda F, Shin CS, Stains J, Civitelli R (2001) Sequence and structure of the mouse connexin45 gene. Biosci Rep 21:683-689.
6. Castro CHM, Stains JP, Sheikh SS, Szejnfeld VL, Willecke K, Theis M, Civitelli R (2003) Development of mice with osteoblast-specific connexin43 gene deletion. Cell Commun Adhes 10:445-450.
7. Stains JP, Lecanda F, Screen J, Towler DA, Civitelli R (2003) Gap junctional communication modulates gene transcription by altering recruitment of Sp1 and Sp3 to connexin-response elements in osteoblast promoters. J Biol Chem 278:24377-24387.
8. Stains JP, Civitelli R (2003) Genomic approaches to identifying transcriptional regulators of osteoblast differentiation. Genome Biology 4:Article Number 222.
9. Castro C, Shin CS, Stains JP, Cheng SL, Mbalaviele G, Civitelli R. (2004) Targeted expression of a dominant negative N-cadherin in vivo delays peak bone mass acquisition and increases adipogenisis. J Cell Science 117:2853-2864.
10. Mbalaviele G, Sheikh S, Stains JP, Salazar VS, Cheng SL, Chen D, Civitelli R (2005) -catenin and BMP-2 synergize to promote osteoblast differentiation and new bone formation. J Cell Biochem 94:403-418. [PMCID: PMC2647989]
11. Stains JP, Lecanda F, Towler DA, Civitelli R (2005) Heterogeneous nuclear ribonucleoprotein K represses transcription from a cytosine-thymidine-rich element in the osteocalcin promoter. Biochem J 385:613-623.
12. Stains JP, Civitelli R (2005) Cell-cell interactions in regulating osteogenesis and osteoblast function. BDRC:Embryo Today, 75:72-80.
13. Stains JP, Civitelli R (2005) Gap junctions regulate extracellular signal-regulated kinase (ERK) signaling to affect gene transcription. Mol Biol Cell 16:64-72. [PMCID: PMC539152]
14. Stains JP, Civitelli R (2005) Cell-to-cell interactions in bone. Biochem Biophys Res Commun 328:721-727.
15. Stains JP, Civitelli R (2005) Gap junctions in skeletal development and function. Biochim Biophys Acta, 1719:69-81.
16. Chung DJ, Castro CH, Watkins M, Stains JP, Chung MY, Szejnfeld VL, Willecke K, Theis M, Civitelli R (2006) Low peak bone mass and attenuated anabolic response to parathyroid hormone in mice with an osteoblast-specific deletion of connexin43. J Cell Sci 119:4187-4198.
17. Niger C, Lima F, Stains JP (2006) Gap junctional communication in bone: role in cell function and disease. Curr Opin Ortho, 17: 390-397.
18. Lima F, Niger C, Hebert C, Stains JP (2009) Connexin43 potentiates osteoblast responsiveness to fibroblast growth factor 2 via a protein kinase C-delta/Runx2-dependent mechanism. Mol Biol Cell 20:2697-2708. [PMCID: PMC2688549]
19. Yu, M; Moreno JL, **Stains JP**, Keegan, AD (2009) Complex regulation of tartrate-resistant acid phosphatase (TRAP) expression by interleukin 4 (IL-4): IL-4 indirectly suppresses receptor activator of NF -kappaB ligand (RANKL)- mediated TRAP expression but modestly induces its expression directly. J. Biol Chem 284:32986-32979. [PMCID: PMC2781712]
20. Niger C, Howell FD, Stains JP (2010) Interleukin-1 increases gap junctional communication among synovial fibroblasts via the extracellular signal regulated kinase pathway. Biol Cell, 102:37-49. [PMCID: PMC2874634]
21. Niger C, Hebert C, Stains JP (2010) Interaction of Connexin43 and Protein Kinase C-delta during FGF2 Signaling. BMC Biochem, 11:14. [PMCID- PMC2855512]
22. Gupta RR, Yoo DJ, Hebert C, Niger C, Stains JP (2010) Induction of an osteocyte-like phenotype by fibroblast growth factor-2. Biochem Biophys Res Commun, 402:258-264. [PMCID: PMC2993102]
23. Niger C, Lima F, Yoo DJ, Gupta RR, Buo AM, Hebert C, Stains JP (2011) The Transcriptional Activity of Osterix Requires the Recruitment of Sp1 to the Osteocalcin Proximal Promoter. Bone 49:683-692. [PMCID: PMC3170016]
24. Vucenik I, Stains JP (2012) Obseity and cancer risk: evidence, mechanisms, and recommendations. Ann N Y Acad Sci, 1271:37-43. [PMCID: PMC3476838]
25. Niger C, Buo AM, Hebert C, Duggan BT, Williams MS, Stains JP (2012) ERK acts in parallel to PKC delta to mediate the Cx43-dependent potentiation of Runx2 activity by FGF2 in MC3T3 osteoblasts. Am J Physiol Cell Physiol 302:C-1035-1044. [PMCID: PMC3330735]
26. Nanjundaiah SM, Venkatesha SH, Yu H, Tong L, Stains JP, Moudgil KD (2012) Celastrus and its bioactive Celastrol protect against bone damage in autoimmune arthritis by modulating the osteo-immune crosstalk. J Biol Chem, 287:22216-22226. [PMCID: PMC3381183]
27. Pratt SJ, Shah SB, Ward CW, Inancio MP, Stains JP, Lovering RM (2013) Effects of in vivo injury on the neuromuscular junction in healthy and dystrophic muscles. J Physiol, 591:559-570. [PMCID: PMC3577526]
28. Nanjundaiah SM, **Stains JP**, Moudgil KD (2013) Kinetics and interplay of mediators of inflammation-induced bone damage in the course of adjuvant arthritis. Int J Immunopathol Pharmacol, 26:37-48. [PMCID: PMC3764433]
29. Niger C, Luciotti MA, Buo AM, Hebert C, Ma V, Stains JP (2013) The Regulation of Runx2 by FGF2 and Connexin43 Requires the Inositol Polyphosphate/Protein Kinase Cδ Cascade. J Bone Miner Res, 28:1468-1477. [PMCID: PMC3657330]
30. Hebert C, Stains JP (2013) An Intact Connexin43 is Required to Enhance Signaling and Gene Expression in Osteoblast-like Cells. J Cell Biochem, 114:2542-2550. [PMCID: PMC3963279]
31. Stains JP, Watkins MP, Grimston SK, Hebert C, Civitelli R (2014) Molecular Mechanisms of Osteoblast/Osteocyte Regulation by Connexin43. Calcif Tissue Int, 94:55-67. [PMCID: PMC3815501]
32. Grimston SK, Watkins MP, Stains JP, Civitelli R (2013) Connexin43 modulates post-natal cortical bone modeling and mechano-responsiveness. BoneKey Rep, 2:446. [PMCID: PMC3815501]
33. Buo AM, Stains JP (2014) Gap junctional regulation of signal transduction in bone cells. FEBS Lett, 588:1315-1321. [PMCID: PMC3989400]
34. Pratt SJ, Shah SB, Ward CW, Kerr JP, Stains JP, Lovering RM (2014) Recovery of altered neuromuscular junction morphology and muscle function in mdx mice after injury. Cell Mol Life Sci, 72:153-164. [PMCID: PMC4282693]
35. Lindberg I, Pang HW, Stains JP, Clark D, Yang AJ, Bonewald, L, Li KZ (2015) FGF23 is endogenously phosphorylated in bone cells. J Bone Miner Res, 30:431-436. [PMCID: In Process]
36. Casagrande D, Stains JP, Murthi AM (2015) Identification of shoulder osteoarthritis biomarkers: comparison between shoulders with and without osteoarthritis. J Shoulder Elbow Surg, 24:382-390. [PMCID: PMC4331258]
37. Gupta A, Niger C, Buo AM, Eidelman, ER, Chen RJ, **Stains JP** (2014) Connexin43 enhances the expression of osteoarthritis-associated genes in synovial fibroblasts in culture. BMC Musculoskelet Disord, 15:425. [PMCID: PMC4295231]
38. Gupta RR, Kim H, ChanYK, Hebert C, Gitajn L, Yoo DJ, O’Toole RV, Hsieh AH, **StainsJP** (2015) Axial Strain Enhances Osteotomy Repair with a Concomitant Increase in Connexin43 Expression. Bone Res 3:15007 [PMCID: PMC4411567]
39. Liu S, Niger C, Koh EY, **Stains JP** (2015) Connexin43 mediated delivery of ADAMTS5 targeting siRNAs from mesenchymal stem cells to synovial fibroblasts. Plos One 10:e0129999. [PMCID: PMC4468185]
40. Plotkin LI, **Stains JP** (2015) Connexins and pannexins in the skeleton: gap junctions, hemichannels and more. Cell Mol Life Sci 72:2853-2867. [PMCID: PMC4503509]
41. **Stains JP**, Civitelli R (2016) Connexins in the skeleton. Semin Cell Dev Biol 50:31-39. [PMCID: PMC4779380]
42. Gupta A, Anderson H, Buo AM, Moorer MC, Ren M, **Stains JP** (2016) Communication of cAMP by connexin43 gap junctions regulates osteoblast signaling and gene expression. Cell Signal 28:1048-1057. [PMCID: PMC4899183]
43. Stains JP, Civitelli R (2016) A Functional Assay to Assess Connexin 43-Mediated Cell-to-Cell Communication of Second Messengers in Cultured Bone Cells. Methods Mol Biol, Vol 1437: 193-201 [PMCID: PMC4959905].
44. Buo AM, Williams MS, Kerr JP, **Stains JP** (2016) A cost effective method to enhance adenoviral transduction of primary murine osteoblasts and bone marrow stromal cells. Bone Res 4:16021 [PMCID: PMC4977485]
45. Moorer MC, Buo AM, Garcia-Pelagio K, **Stains JP**, Bloch RJ (2016) Deficiency of the intermediate filament synemin reduces bone mass in vivo. Am J Physiol Cell Physiol 311:C839-C845. [PMCID: PMC5206296] *This work was the highlighted by an Editorial Focus*
46. Calabrese G, Mesner LD, **Stains JP**, Tommasini SM, Horowitz MC, Rosen CJ, Farber CR (2016) Integrating GWAS and coexpression network data identifies causal BMD genes. Cell Systems 4:46-59. [PMCID: PMC5269473]
47. Iyer SR, Shah SB, Valencia AP, Schneider MF, Hernandez-Ochoa EO, **Stains JP**, Blemker SS, Lovering RM (2016) Altered nuclear dynamics in MDX myofibers. J Appl Physiol 122:470-481. [PMCID: PMC5401960]
48. Lyons JS, Iyer SR, Lovering RM, Ward CW, **Stains JP** (2016) Novel multi-functional fluid flow device for studying cellular mechanotransduction. J Biomech 49:4173-4179. [PMCID: PMC5164981]
49. Iyer SR, Xu S, **Stains JP**, Bennett CH, Lovering RM (2016) Supermagnetic iron oxide nanoparticles in musculoskeletal biology. Tissue Eng Part B Rev 23:373-385. [PMCID: PMC5567433]
50. Moorer MC, Hebert C, Tomlinson RE, Iyer SR, Chason M, **Stains JP** (2017) Defective signaling, osteoblastogenesis, and bone remodeling in a mouse model of connexin43 C-terminal truncation. J Cell Sci 130:531-540. [PMCID: PMC5312734]
51. Moorer MC, **Stains JP** (2017) Connexin43 and the intercellular signaling network regulating skeletal remodeling. Curr Osteoporos Rep 15:24-31. [PMCID: PMC5332069]
52. Buo AM, Tomlinson RE, Eidelman ER, Chason M, **Stains JP** (2017) Connexin43 and Runx2 Interact to Affect Cortical Bone Geometry, Skeletal Development, and Osteoblast and Osteoclast Function. J Bone Miner Res 32:1727-1738. [PMCID: PMC5550348]
53. Chiaramonti AM, Robertson AD, Nguyen TP, Jaffe DE, Hanna EL, Holmes R, Barfield WR, Fourney WL, **Stains JP**, Pellegrini VD Jr. (2017) Pulsatile Lavage of Musculoskeletal Wounds Causes Muscle Necrosis and Dystrophic Calcification in a Rat Model. J Bone Joint Surg Am. 99:1851-1858. [PMCID: Pending]
54. Lyons JS, Joca HC, Law RA, Williams KM, Kerr JP, Shi G, Khairallah RJ, Martin SS, Konstantopoulos K, Ward CW, **Stains JP** (2017) Microtubules tune mechanotransduction through NOX2 and TRPV4 to decrease sclerostin abundance in osteocytes. Sci. Signal. 10, eaan5748. [PMCID: PMC5858867]
55. Pratt SJP, Hernandez-Ochoa EO, Lee RM, Ory EC, Lyons JS, Joca HC, Johnson A, Thompson K, Bailey P, Lee CJ, Mathias T, Vitolo MI, Trudeau M, **Stains JP**, Ward CW, Schneider MF, Martin SS (2018) Real-time scratch assay reveals mechanisms of early calcium signaling in breast cancer cells in response to wounding. Oncotarget, 9:25008-25024. [PMCID: PMC5982755]
56. Choi JY, Lai JK, Xiong ZM, Ren M, Moorer MC, **Stains JP**, Cao K (2018) Diminished canonical β-catenin signaling during osteoblast differentiation contributes to osteopenia in progeria. J Bone Miner Res 33:2059-2070. *Co-corresponding author.* [PMCID In Process]
57. Long KK, O’Shea KM, Khairallah RJ, Howell K, Paushkin S, Chen KS, Cote SM, Webster MT, **Stains JP**, Treece E, Buckler A, Donovan A (2018) Specific inhibition of myostatin activation is beneficial in mouse models of SMA therapy. Human Mol Genet 28:1076-1089 [PMCID: PMC6423420].
58. Robertson AD, Chiaramonti AM, Nguyen TP, Jaffe DE, Holmes RE, Hanna EL, Rhee JG, Barfield WR, Fourney WB, **Stains JP**, Pellegrini VD (2018) Failure of Indomethacin and Radiation to Prevent Blast-induced Heterotopic Ossification in a Sprague-Dawley Rat Model. Clin Orthop Relat Res 477:644-654 [PMCID: PMC6382204].
59. Gupta A, Leser JM, Gould NR, Buo AM, Moorer MC, **Stains JP** (2019) Connexin43 regulates osteoprotegerin expression via ERK1/2 -dependent recruitment of Sp1. Biochem Biophys Res Commun 509:728-733. [PMCID: PMC6369926].
60. Balenga N, Koh J, Azimzadeh P, Hogue J, Gabr M, **Stains JP**, Olson JA. (2019) Parathyroid-targeted overexpression of Regulator of G-Protein Signaling 5 (RGS5) causes hyperparathyroidism in transgenic mice. J Bone Miner Res 34:955-963. [PMCID In Process]
61. Iyer SR, Shah SB, Ward CW, **Stains JP**, Spangenburg EE, Folker ES, Lovering RM. (2019) Differential YAP nuclear signaling in healthy and dystrophic skeletal muscle. Am J Physiol Cell Physiol. 317:C48-C57 [PMCID: PMC6689751].
62. Gupta A, Chatree S, Buo AM, Moorer MC, **Stains JP** (2019) Connexin43 enhances Wnt and PGE2-dependent activation of β-catenin in osteoblasts. Pflügers Arch. 471:1235-1243 [PMCID: PMC6711805].
63. Chellaiah, MA, Moorer MC, Majumdar S, Aljohani H, Morley SC, Yingling V, **Stains JP** (2020) L-Plastin deficiency produces increased trabecular bone due to attenuation of sealing ring formation and osteoclast dysfunction. Bone Res 8:3. [PMCID: PMC6976634]
64. Williams KM, Leser JM, Gould NR, Joca HC, Lyons JS, Khairallah RJ, Ward CW, **Stains JP**. (2020) TRPV4 Calcium Influx Controls Sclerostin Protein Loss Independent of Purinergic Calcium Oscillations. Bone 136:115356 [PMCID: In Process]
65. Pratt SJP, Lee RM, Chang KT, Hernández-Ochoa EO, Annis DA, Ory EC, Thompson KN, Bailey PC, Mathias TJ, Ju JA, Vitolo MI, Schneider MF, **Stains JP**, Ward CW, Martin SS (2020) Mechanoactivation of NOX2-generated ROS elicits persistent TRPM8 Ca2+ signals that are inhibited by oncogenic KRas. Proc Natl Acad Sci U S A. [PMCID: In Process]

Non-Peer Reviewed Journal Articles:

1. Vucenik I, Stains J (2010) Cancer preventive and therapeutic properties of IP6: efficacy and mechanisms. Periodicum Biologorum, 112:451-458.
2. Vucenik I, Stains JP, Jones LP (2014) The association between obesity and cancer. Periodicum Biologorum, 116:347-353.

Book Chapters

1. Civitelli R, Stains JP, Shin CS, Jorgensen NR (2008) Intercellular junctions and cell-cell communication in the skeletal system. Principles of Bone Biology, 3rd Ed. Editors, Bilezikian JP, Raisz LG, Matin TJ. Academic Press, 425-445.
2. Taraban MB, Li Y, Joyner KA, Stains JP, Yu YB (2016) Impact of matrix dynamic properties on stem cell viability. In Situ Tissue Regeneration: Host Cell Recruitment and Biomaterial Design, 3rd Ed. Editors, Lee SJ, Yoo JJ, Atala A. Academic Press, 203-213.
3. Stains JP, Fontana F, Civitelli R (2018) Intercellular junctions and cell-cell communication in the skeletal system. Principles of Bone Biology, 4th Ed. Editors, Bilezikian JP, Raisz LG, Matin TJ. Academic Press.
4. Stains JP (2020) Bone Cell Communication through Gap Junctions. Encyclopedia of Bone Biology, Editor, Zaidi M. Elsevier Ltd.

Abstracts

1. Stains JP, Gay CV. (1997) Characterization of Na-Ca exchange protein in primary cultured osteoblasts. J Bone Miner Res 12:S221 Suppl. ASBMR Cincinnati, OH.
2. Weber JA, Stains JP, Gay CV. (1999) Novel cDNAs isolated from cultured chick osteoblasts. J Bone Miner Res 14:F118 Suppl. ASBMR, St Louis, MO.
3. Stains JP, Gay CV. (1999) The inhibition of Na+/Ca2+ exchanger impacts mineral deposition in osteoblast cultures. J Bone Miner Res 14:SA010 Suppl. ASBMR, St Louis, MO.
4. Furlan F, Screen J, Stains J, Civitelli R. (2002) Lack of connexin43 (Cx43) causes global osteoblast dysfunction. J Bone Miner Res 17:M212 Suppl. ASBMR San Antonio, TX.
5. Mbalaviele G, Sheikh S, Cheng SL, Stains JP, Civitelli R. (2002) Signaling via B-catenin directs osteogenic lineage allocation independent of Cbfa1. J Bone Miner Res 14:F118 Suppl. ASBMR San Antonio, TX.
6. Stains JP, Lecanda F, Towler DA, Civitelli R. (2002) Heterogeneous nuclear ribonucleoprotein K represses transcription from a CT element in the osteocalcin promoter. J Bone Miner Res 17:SA183 Suppl. ASBMR San Antonio, TX.
7. Stains JP, Lecanda F, Screen J, Towler DA, Civitelli R. (2002) A CT-rich element in the proximal oteocalcin promoter confers sensitivity to gap junctional communication. J Bone Miner Res 17:F182 Suppl. ASBMR San Antonio, TX.
8. Stains JP, Lecanda F, Screen J, Towler DA, Civitelli R. (2002) Gap junctions regulate recruitment of Sp1/Sp3 to the osteocalcin promoter. Mol Biol Cell 13:1204. ASCB, San Francisco, CA.
9. Castro C, Sheikh S, Stains JP, Screen J, Civitelli R. (2003) Osteoblast specific connexin43 (Cx43) gene deletion in mice leads to reduced peak bone mass and osteoblast dysfunction. Bone 32:S82 Suppl. IBMS-JSBMR, Osaka, Japan.
10. Castro CHM, Stains JP, Civitelli R. (2003) The anabolic response to intermittent PTH (1-34) requires connexin43 (Cx43) mediated gap junctional communication. J Bone Miner Res 18:S100 Suppl. ASBMR Minneapolis, MN.
11. Mbalaviele G, Sheikh, Cheng S, Stains J, Civitelli R. (2003) The osteogenic activity of beta-catenin requires interaction with BMP-2 effectors. J Bone Miner Res 18:S14 Suppl. ASBMR Minneapolis, MN.
12. Stains JP, Civitelli R. (2003) Osteoblast Gene Transcription from Connexin-Response Elements (CxRE) is Regulated by the PKC/Raf/MEK/ERK Pathway. J Bone Miner Res 18:S46 Suppl. ASBMR Minneapolis, MN. *Oral presentation.*
13. De Marzo A, Stains JP, Civitelli R. (2004) Connexins and PTH regulation of the osteocalcin promoter. J Bone Miner Res 19:S336 Suppl. ASBMR Seattle, WA.
14. Chung DJ, Screen J, Stains JP, Liu C, Civitelli R. (2004) Osteoblast-specific ablation of connexin43 (Cx43) attenuates the anabolic response of intermittent PTH (1-34) in aged mice. J Bone Miner Res 19:S177 Suppl. ASBMR Seattle, WA.
15. Salazar VS, Stains JP, Mbalaviele G, Civitelli R. (2004) Structure/activity analyses of -catenin in osteoblast differentiation. J Bone Miner Res 19:S80 Suppl. ASBMR Seattle, WA.
16. Stains JP, Civitelli R. (2004) Gap junctions regulate extracellular signal related kinase (ERK) signaling to affect osteoblast gene transcription. J Bone Miner Res 19:S28 Suppl 2004. ASBMR Seattle, WA.
17. DeMarzo A. **Stains JP**, Civitelli R (2005) Interference with connexin43 function attenuates the parathyroid hormone regulation of the rat osteocalcin promoter.  J Bone Miner Res 20 (9): S430-S430. ASBMR Nashville, TN.
18. Niger C, Lima F, **Stains JP** (2005) Implication of connexin43 gap junctions in the responsiveness of HIG-82 cells to interleukin1 beta treatment. J Bone Miner Res 20 (9): S205-S205. ASBMR Nashville, TN.
19. Lima F, Niger C, Civitelli R, **Stains JP** (2005)Modulation of connexin43 alters the osteoblast response to serum, FGF2 and IGF1. J Bone Miner Res 20 (9): S250-S251. ASBMR Nashville, TN.
20. Niger C, Stains JP (2006) Association of connexin43 with signal complexes required for growth factor signaling in osteoblasts. J Bone Miner Res 21:S158. ASBMR Philadelphia, PA
21. Lima F, Niger C, Stains JP (2006) Gap junctional communication potentiates the osteoblastic response to FGF2. J Bone Miner Res 21:S368. ASBMR Philadelphia, PA.
22. Lima F, Niger C, Stains JP (2007) Connexin43 amplifies FGF2-responsiveness in a Runx2/Protein Kinase C delta-dependent manner. J Bone Miner Res 22:S369. ASBMR, Honolulu, HI.
23. Niger C, Howell FD, Stains JP (2007) Involvement of connexin43 in interleukin-1beta induced osteoarthritis-associated changes in synovial fibroblasts. J Bone Miner Res 22:S272. ASBMR, Honolulu HI.
24. Niger C, Lima F, Stains JP (2008) Fibroblast growth factor 2 signaling in osteoblasts: connexin43 is a docking platform for protein kinase C delta. J Bone Miner Res 23: S88. ASBMR, Montreal, QE
25. Niger C, Lima F, Yoo D, Gupta RR, Hebert C, Stains JP (2010) The transcriptional activity of Osterix requires the recruitment of Sp1 but not Sp3 to the osteocalcin proximal promoter. J Bone Miner Res. ASBMR, Toronto, ON.
26. Niger F, Luciotti MA, Stains JP (2011) Phospholipase Cgamma1 and Inositol Hexakisphosphate Kinase1/2 are required for the Cx43-dependent amplification of the osteoblast response to FGF2. J Bone Miner Res 26: S456. ASBMR, San Diego, CA.
27. Niger C, Luciotti MA, Buo AM, Hebert C, Ma V, Stains JP (2012) The inositol polyphosphate/protein kinase C Signaling cascade is required for the connexin43-dependent amplification of Runx2 activity. ASBMR, Minneapolis, MN. *Oral presentation*.
28. Buo A, **Stains JP** (2012) Utilizing hTERT-Immortalized primary mouse osteoblast cells to assess the role of Cx43 in Osteoblast signaling pathways. ASCB, San Francisco, CA.
29. Hebert C, **Stains JP** (2012) The Role of the Connexin43 C-Terminal Tail in the Potentiation of FGF2 Signaling in Osteoblast-like Cells. ASCB, San Francisco, CA.
30. Niger C, Luciotti MA, Buo AM, Hebert C, Ma V, Stains JP (2012) Molecular mechanisms underlying the Connexin43-dependent amplification of Fibroblast Growth Factor-2 signaling in MC3T3 osteoblasts. ASCB, San Francisco, CA.
31. Hebert C, Stains JP (2013) Both the connexin43-specific channel and C-terminus are required for the regulation of Runx2 activity and osteoblast gene expression. J Bone Miner Res. ASBMR, Baltimore, MD.
32. Buo A, Stains JP (2013) Utilizing hTERT-Immortalized primary mouse osteoblast cells to assess the role of Cx43 in Osteoblast signaling pathways. J Bone Miner Res. ASBMR, Baltimore MD.
33. Buo A, Stains JP (2015) Assessing the skeletal phenotype of compound Gja1+/-Runx2+/- mice. J Bone Miner Res. ASBMR, Seattle WA*. Oral presentation. Young Investigator Award Winner (AB)*.
34. Moorer MC, Hebert C, Stains JP (2015) Structure-Function Analysis of Connexins as Active Regulators of Signal Transduction in Osteoblasts. J Bone Miner Res. ASBMR, Seattle WA*. Oral presentation. Young Investigator Travel Award Winner (MCM)*.
35. Gupta A, Anderson HM, **Stains JP** (2015) Communication of cyclic AMP by Connexin43 gap junctions influences osteoblast signaling and gene expression. J Bone Miner Res. ASBMR, Seattle WA. *Plenary poster.*
36. Iyer S, Gupta A, Valencia AP, **Stains JP**, Lovering RM (2016) Eccentric contractions promote osteoclast activity in the tibia. Med Sci Sports Exerc. 48(5 Suppl 1):308
37. Moorer MC, Hebert C, Tomlinson RE, Liu S, Chason M, Stains JP (2016) Truncation of the Cx43 C-terminal domain disrupts multiple signaling pathways and recapitulates the skeletal phenotype of full length Cx43 conditional deletion in the osteoblast lineage. J Bone Miner Res. ASBMR, Atlanta GA. *Plenary poster. Young Investigator Travel Award Winner (MCM).*
38. Lyons J, Kerr J, Ward C, **Stains JP** (2016) Taxol-induced stabilization of the microtubule network blunts osteoblast/osteocyte response to fluid shear stress. J Bone Miner Res. ASBMR, Atlanta GA.
39. Iyer S, Gupta A, Valencia AP, **Stains JP**, Lovering RM (2016) Eccentric Contractions Promote Osteoclast Activity in the Tibia. Med Sci Sports Exerc 48:308.
40. Buo AM, **Stains JP** (2017) Connexin43 and Runx2 Interact to Affect Cortical Bone Geometry, Skeletal Development, and Osteoblast and Osteoclast Function. International Gap Junction Conference. Glasgow, UK.
41. Lyons JS, Joca HC, Law RA, Kerr JP, Shi G, Khairallah RJ, Konstantopoulos K, Ward CW, **Stains JP** (2017) Microtubule-dependent regulation of a signaling relay that tunes the osteocyte mechanical load response. J Bone Miner Res. ASBMR, Denver CO.
42. Moorer MC, Hebert C, **Stains JP** (2017) Connexins form distinct complexes with signaling machinery that differentially affect osteoblast signaling and gene expression. J Bone Miner Res. ASBMR, Denver CO.
43. Williams KM, Jones D, Ward CW, **Stains JP** (2018) The contribution of TRPV4-dependent calcium influx and purinergic calcium oscillations to the regulation of sclerostin during osteocyte mechano-sensing. J Bone Miner Res, ASBMR, Montreal CA.
44. Garcia-Pelagio KP, Buo AM, Chen L, Moorer M, **Stains JP**, Bloch RJ (2019) The mechanical role of a cytoskeletal protein, Synemin, in bone, heart and skeletal muscle. AIP Conference Proceedings 2090, 050008.
45. Williams KM, Joca HC, Lyons JS, Srikanth MP, Gould NR, Khairallah RJ, Feldman RA, Ward CW, **Stains JP** (2019) “Rapid lysosomal degradation of sclerostin in osteocytes following mechanical load” J Bone Miner Res, ASBMR, Orlando FL. *Oral Presentation*.
46. ASBMR 2020 Nicole Oral
47. ASBMR 2020 Jenna Plenary Poster

Major Invited Speeches

1. November 2000. The Pennsylvania State University Department of Biochemistry and Molecular Biology Research Seminar. “Characterization of Na+/Ca2+ exchanger in osteoblasts and investigation into its role in mineralization.”
2. December 2000. Washington University Medical Center Bone Conference. “Role of Na+/Ca2+ exchanger in mineralization by osteoblasts.”
3. November 2002. Washington University Medical Center Bone Conference. “Modulation of osteoblast gene expression by gap junctional communication.”
4. January 2003. Mount Sinai School of Medicine Orthopedics Research Seminar. “Modulation of osteoblast gene expression by gap junctional communication.”
5. July 2003. University of Maryland Medical School, Baltimore Orthopaedics Research Seminar. “Regulation of osteoblast gene transcription by gap junctional communication.”
6. September 2003. American Society of Bone & Mineral Research Meeting, Minneapolis. “Osteoblast gene transcription from connexin-response elements (CxRE) is regulated by the PKC/Raf/MEK/ERK pathway.”
7. October 2003. Washington University Medical Center Bone Conference. “Defining the molecular mechanisms of gap junctional regulation of osteoblast gene transcription.”
8. October 2004. American Society of Bone & Mineral Research Meeting, Seattle. “Gap Junctions Regulate Extracellular Signal-Regulated Kinase (ERK) Signaling to Affect Osteoblast Gene Transcription.”
9. May 2006. University of Maryland, School of Dentistry. The Role of Gap Junctions in Intercellular Signaling among Osteoblasts. Biology Seminar Series.
10. February 2007. University of Maryland, Center for Vascular and Inflammatory Diseases. Gap junctional communication in skeletal systems.
11. September 2009. Maryland Chapter of the Arthritis Foundation. “Connexin43 and gap junctions in arthritic diseases.”
12. April 2010. University of Maryland, Department of Physiology. “Connexin43 and Intercellular Signaling in Osteoblasts.”
13. February 2011. Food and Drug Administration. “Osteoblasts in skeletal biology and pathology.” CME credit
14. October 2011. University of Maryland, Cell Signaling Research Initiation Group. “The Role of the PLC/IP6K1/PKCδ Axis in Gap Junctional Communication between Osteoblasts.”
15. October 2012. American Society of Bone & Mineral Research Meeting, Minneapolis. “The inositol polyphosphate/protein kinase C Signaling cascade is required for the connexin43-dependent amplification of Runx2 activity.”
16. November 2012. Johns Hopkins University, Department of Orthopaedic Surgery. “Influence of cell-to-cell communication on bone cell function.”
17. December 2012. American Society for Cell Biology Meeting, San Francisco. “Connexin43-dependent regulation of osteoblast gene expression involves signaling via the Inositol polyphosphate/Protein Kinase Cδ cascade.”
18. February 2013. University of Maryland, Center for Vascular and Inflammatory Diseases. “Influence of cell-to-cell communication on bone cell function.”
19. July 2013. International Gap Junction Conference, Charleston, SC. “Both the Connexin43-specific Channel and C-terminus Are Required for the Regulation of Runx2 Activity and Osteoblast Gene Expression.”
20. December 2014. University of Maryland School of Medicine Council “The Impact of Cell-to-Cell Communication on Bone Cell Function”
21. February 2014. Maxcyte, Gaithersburg, MD. “Using Gap Junctions to Enhance Stem Cell Therapies in Osteoarthritis.”
22. February 2014. Department of Medical Research and Technology, University of Maryland School of Medicine “Cell-to-cell communication in skeletal systems”. CME credit
23. December 2014. Maryland Stem Cell Center Retreat. “Using Gap Junctions to Enhance Stem Cell Therapies in Osteoarthritis.”
24. February 2015. Avioli Musculoskeletal Seminar, Washington University in St Louis. “Cell-to-cell communication: Connexin43 as a docking platform for integrating bone cell signaling”
25. March 2015. SOD Oncology and Diagnostic Sciences Seminar Series, University of Maryland School of Dentistry “Cell-to-cell communication: Connexin43 as a docking platform for integrating bone cell signaling”
26. April 2015. Lehigh University Colloquium Seminar “Cell-to-cell communication: Connexin43 as a docking platform for integrating bone cell signaling”
27. May 2015. IUPUI Bone and Mineral Club “Cell-to-cell communication in bone: second messenger and signaling cascades regulating osteoblast function”.
28. October 2015. Johns Hopkins University, Department of Orthopaedic Surgery “Cell-to-cell communication: Connexin43 as a docking platform for integrating bone cell signaling”
29. May 2016. University of Texas Health Sciences Center at San Antonio, Department of Biochemistry “Cell-to-cell communication: Connexin43 as a docking platform for integrating bone cell signaling”
30. August 2016. Penn State College of Medicine at Hershey “Connexin43: a signaling network controlling bone remodeling”
31. September 2017. University of Western Ontario “Connexin43 Gap Junctions and the Control of Osteogenesis”
32. September 2017. Thomas Jefferson University “Connexin43 Gap Junctions and the Control of Osteogenesis”
33. December 2017. University of Maryland School of Medicine, Festival of Science. “Microtubule X-ROS: Mechanotransduction in Aging Heart, Skeletal Muscle and Bone.”
34. April 2018. Biomedical Engineering and Technology Retreat. UMB-UMBC “Microtubules, Mechanotransduction, and The Osteocyte”
35. May 2018. Texas A&M Health Sciences Center “Microtubules, Mechanotransduction, and The Osteocyte”
36. April 2019. Experimental Biology 2019. “Connexin43 Gap Junctions and the Control of Skeletal Remodeling”
37. April 2019. Mifflin County High School. “Homeostasis: stability and adaptation in the face of a changing environment”
38. November 2019. Johns Hopkins University, Mid Atlantic Nutrition Obesity Research Center. “Interaction between Bone, Sclerostin, and Adipose Tissue.”
39. February 2020. Augusta University. “Microtubules, Osteocyte Mechanotransduction, and the Surprising Regulation of Sclerostin”
40. April 2020. University of Pennsylvania. “Microtubules, Osteocyte Mechanotransduction, and the Surprising Regulation of Sclerostin”

**Proffered Communications**

1. **Stains JP**, Civitelli R. (2003) Transcription from a connexin-response element (CxRE) is regulated by the PKC/Raf/MEK/ERK pathway. International Gap Junction Conference, Cambridge, UK.
2. Civitelli R, Chung DJ, DeMarzo A, Stains JP, Theis M, Willecke K (2005) Connexin43 is required for the anabolic effects of parathyroid hormone on bone mass and osteoblast gene expression. International Gap Junction Conference, Whistler, Canada.
3. Gupta RR, Stains JP (2008) The Transformation of MC3T3-E1 osteoblastic cells into osteocytes by FGF2 administration. Maryland Orthopaedic Association, Baltimore, MD.
4. Niger C, Howell FD, Stains JP (2009) The role of connexin43 and interleukin-1b in the production of matrix metalloproteinases by synovial fibroblasts. Orthopaedic Research Society, Las Vegas, NV.
5. Duggan B, Gupta RR, Moreno JL, Stains JP (2009) Characterization of fibroblast growth factor receptor variation in mouse osteoblasts. Eastern Orthopaedic Association, Paradise Island, Bahamas.
6. Duggan B, Moreno JL, Stains JP (2009) Characterization of fibroblast growth factor receptor variation in mouse osteoblasts. Maryland Orthopaedic Association, Baltimore, MD.
7. Gupta RR, Kim H, Chan YK, O’Toole RV, Hsieh A, Stains JP (2009). Role of gap junctions in mechanical load induced fracture repair. Maryland Orthopaedic Association, Baltimore, MD.
8. Casagrande D, Murthi AM, **Stains JP** (2010) Identification of shoulder osteoarthritis biomarkers: a comparison between those with and without osteoarthritis. Maryland Orthopaedic Association, Baltimore, MD.
9. Leung S, Griffith C, O’Toole RV, Hsieh A, Pellegrini VD, Gupta RR, **Stains JP**, Gitajn L (2010) A small animal model demonstrating both primary and secondary bone healing: a novel bilateral femoral fracture model in Sprague-Dawley rats. Maryland Orthopaedic Association, Baltimore, MD.
10. Niger C, Lima F, Hebert C, Stains JP (2010) Protein Kinase C is Recruited to Gap Junctions Where It Participate in the Connexin43-dependent Amplification of the FGF2 Response in MC3T3 Osteoblasts. Orthopaedic Research Society, New Orleans, LA.
11. Gupta RR, **Stains JP** (2010) Does Continuous FGF-2 Treatment Transform MC3T3-E1 Osteoblasts into Osteocytes? Orthopaedic Research Society, New Orleans, LA.
12. Niger C, Lima F, Buo A, Yoo D, Gupta RR, Hebert C, **Stains JP** (2011) Osterix and Sp1 cooperatively regulate transcriptional activity from the osteocalcin proximal promoter. Orthopaedic Research Society, Long Beach, CA.
13. Hebert C, **Stains JP** (2011) The Intact C-terminal Tail of Connexin43 is Required for the Potentiation of FGF2 Signaling in Osteoblast-like cells.International Gap Junction Meeting, Ghent, Belgium.
14. Niger C, Luciotti MA, **Stains JP** (2011) Phospholipase Cgamma1 and Inositol Hexakisphosphate Kinase 1/2 are Required for the Cx43-dependent Amplification of the Osteoblast Response to FGF2.International Gap Junction Meeting, Ghent, Belgium.
15. Jaffe D, Yoo D, Gasbarro G, Blevins J, Hughes T, Schultz B, **Stains J**, Pellegrini, V (2012) Fracture Fixation Determines the Pathway of Osseous Repair: A bilateral femur fracture model in the rat. Orthopaedic Research Society, San Francisco, CA.
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