HUGO A PEDROZO, Ph.D.

ADDRESS

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Google Scholar Citations: https://scholar.google.com/citations?user=mokCLkYAAAAJ&hl=en
Google Patents: https://patents.google.com/?inventor=Pedrozo+hugo&oq=Pedrozo+hugo&page=1

EDUCATION

Ph.D. Physiology minor in Cell & Structural Biology, 1988-1995
The University of Texas Health Science Center at San Antonio, TX

BS in Biology, 1985-1988
The University of Texas at San Antonio, TX

CURRENT CERTIFICATIONS

Biomedical Research Investigators and Key Personnel. CITI Program. Credential ID: 58527852 https://www.citiprogram.org/verify/?w984693d7-7f7e-48ad-8109-94fdcd0d131b-58527852

GCP for Clinical Trials with Investigational Drugs and Medical Devices (U.S. FDA Focus). CITI Program. Credential ID: 58527850 https://www.citiprogram.org/verify/?wbd8a3887-3364-4050-9864-f6c7056344e5-58527850

ACADEMIC EXPERIENCE

Courses taught: Human Anatomy and Physiology, Human Physiology, Cell Biology, Introductory Biology, Molecular Genetics, Introduction to Pathophysiology, and Undergraduate Research

Areas of research interest: *Clinical use of marrow-derived stem cells. Comparative genomics of symbiont-host metabolism*

Associate Professor of Instruction, Texas State University, San Marcos, TX 09/2024-cur
Department of Biology, College of Science and Engineering, Texas State University
Human Anatomy and Physiology lecture and laboratories

Lecturer, Texas State University, San Marcos, TX 2017-08/2024
Department of Biology, College of Science and Engineering, Texas State University
Human Anatomy and Physiology lecture and laboratories

Visiting Assistant Professor, St Edwards University, Austin, TX 2015-2017
Department of Biological Sciences, School of Natural Sciences, St Edward's University, Austin, TX
Human Physiology lecture and laboratories; Cell Biology; Molecular Genetics; Introductory Biology

Adjunct Professor, St Edwards University, Austin, TX 2014-2015
Department of Biological Sciences, School of Natural Sciences, St Edward's University, Austin, TX

Postdoctoral Fellow & Instructor, Department of Orthopedics, UTHSCSA, TX 1995-1999
Paracrine and autocrine regulatory mechanisms of TGF-beta1 production and activation by Vitamin D_3 metabolites and vice-versa, and their role in osteochondral growth plate development.
Accomplishments: A 4 science awards. 14 peer-reviewed publications.

Graduate Instructional Assistant, UTHSCSA, TX 1988-1995
Cardiovascular Physiology Laboratory for Graduate and Medical Students.
Pulmonary Physiology for Occupational Therapy, Summer 1991
Non-invasive Cardiovascular Physiology Laboratory for Occupational Therapy, Sum91, 92, & 93
Cardiovascular Physiology Laboratory for Physical Therapy, Summer 1991, UTHSCSA
General Physiology Tutor for Dental Students. Fall 1991, UTHSCSA

MENTORSHIP EXPERIENCE

Lexi Beaver, Master Student (co-mentor with Shanon Weigum, PhD), Texas State University. *Buoyancy-assisted separation of stem cells from human marrow.* Sept 2022-May 2023

Chirs Kaufmann: Student intern at Kinetic Concepts Inc, San Antonio, TX. Fabrication of a dermal allograft cellular scaffold with interconnected porosity. Spring 2009

Matt Widmer; Student intern at DePuy, A Johnson and Johnson Company. *Joint resurfacing orthopaedic implant and associated method. US Patent 7,595,062*. Fall 2004

Mark Shuster and Meghan O'Connell, Student interns at DePuy, A Johnson and Johnson Company. *Method for organizing the assembly of collagen fibers and compositions formed therefrom. US Patent 7,354,627*. Summer 2004

Dr. Stuart Rimes, Orthodontics Research Intern. *Physiological Importance of the 1,25(OH)$_2$D$_3$ Membrane Receptor and Evidence for a Membrane Receptor Specific for 24,25(OH)$_2$D$_3$*. 1998-99

Ms. Melanie Robinson, Senior Research Intern. *Potential Mechanisms for the Plasmin-Mediated Release and Activation of Latent Transforming Growth Factor-β1 from the Extracellular Matrix of Growth Plate Chondrocytes*. 1998-99

Ms. Tatiana Mokeyev, Senior Research Intern. *Vitamin D3 metabolites regulate LTBP1 and latent TGF-β1 expression and latent TGF-β1 incorporation in the extracellular matrix of chondrocytes*. Second prize award recipient 1998 Student Competition of the American Association for Dental Research (AADR). 1997-98

Dr. James Mazock. Senior Research Intern. *TGFβ1 regulates 25-hydroxyvitamin D3 1α-and 24-hydroxylase activity in cultured growth plate chondrocytes in a maturation-dependent manner.* First prize award recipient 1997 Student Competition American Association for Dental Research (AADR). 1996-97

ENTREPENEURIAL EXPERIENCE

Owner and Principal Scientist, Orthobiomedical, LLC, Austin, TX 2010-2015
Orthobiomedical (OBM) was founded as a consulting organization in 2007 and became a regenerative technology concept development organization by 2013 with the proof-of-concept for IsoStem, a cell-based regenerative product for spinal applications
Clients: DePuy Orthopedics (now DePuy Synthes), DePuy International, KCI inc, Baylor College of Medicine, Wenzel Spine, Keith Matheny MD, The Advisory Board Company, Alliance Spine, BoneSolutions, Wenzel Spine, Precision Regenerative and Functional Medicine (Austin), and MediRex

SAS (Colombia)
Accomplishments: Created patented and licensed IsoStem, autologous stem cell technology. This technology was licensed to *Wenzel Spine,* Austin, TX., to develop a single-use bone marrow stem cell concentration product for orthopedic use.

INDUSTRY EXPERIENCE

Medical Science Liaison, Spinesmith, LLP, Austin TX 2009-2010
Spinesmith is a 30+-employee company developing and marketing spine fusion products, including hardware, allograft materials and bone marrow concentration systems for point of care use.
Responsibilities: Technology educator and spokesperson for the company's Stem Cell and spine fusion devices. Protocol development for clinical studies using company's stem cells in Spine and Sports Medicine. Sales support and training as needed

Staff Project Engineer-Tissue Engineering & New Concepts, KCI. San Antonio, TX 2007-2009
KCI was a worldwide leader in manufacturing and sale of products for wound management and care, bariatric care, hospital beds, and regenerative medicine.
Responsibilities: To establish, lead and manage a program for the use of negative pressure therapy for the regeneration of articular cartilage. To develop pressure ulcer treatement strategy using a tissue engineering approach
Accomplishments: Established a cartilage regeneration program. Created and patented a porous, interconnected, and resorbable scaffold for tissue regeneration that could withstand the negative pressure applied by the company's VAC system

Director of Biochemistry and Biologics, Calcitec inc., Austin, TX (Start-up) 2005-2007
Calcitec was a start-up based on a proprietary formulation of calcium phosphate mineral with very high compressive strength. One product obtained FDA approval and two more were about to be submitted when the company ceased operations due to loss of funding.
Responsibilities: To establish and grow a drug-delivery and biologics division for the proprietary $CaPO_4$ technology.
Accomplishments: Development of OsteoFix Platform Technology for Drug Delivery: OsteoFix plus BMP2 and OsteoFix plus Gentamicin Sulfate. Proof-of-concept and intellectual property for growth factor technology: Autologous Bone Induction System (ABIS)

Senior Scientist, Emerging Technologies and Concept Development, DePuy Orthopaedics, Warsaw, IN 2003-2005
DePuy Orthopedics (now called DePuy Synthes) is part of the Johnson and Johnson Family of Companies and a worldwide leader in providing healthcare solutions in joint reconstruction, trauma, spinal, craniomaxillofacial surgery and sports medicine.
Responsibilities: To manage the execution of preclinical and pivotal preclinical studies for FDA submissions. To contribute to the expansion of the biologics portfolio by generating proof-of-concept for new products.
Preclinical (animal studies) Projects: Cellect™, Conduit™ TCP granules, SIS™ patch plus GDF5 for soft tissue repair, Vicryl™ plus GDF5 for soft tissue repair.
Accomplishments: Contributed to the success of the regulatory submission for Cellect, alpha-BSM, Symphony PCS and Conduit TCP granules to the FDA. Created new, patented formulations of the SIS patch with greater biocompatibility and faster remodeling. 8 patents.

Scientist, Orthobiologics, DePuy Orthopaedics, Warsaw, IN 1999-2003
Responsibilities: Preclinical evaluation of biomaterials plus growth factors for bone and cartilage repair and regeneration.

Projects: Alpha-BSM plus growth factors: TGF-beta1, PDGF-AB, Symphony PCS PRP. SIS as a bone repair scaffold: guided tissue regeneration approach. Small molecules to speed fracture healing: lovastatin, simvastatin, TP508, and others. Articular Cartilage Regeneration Unit (ACRU) plus Morphogens (TGF-beta1, GDF-5, PDGF-BB)
Accomplishments: In vitro formulations for the delivery of TGF-beta1 and GDF5 with various biomaterials. 2 patents.

SPONSORED RESEARCH

A new method for the production of a supra-concentrate of bone marrow stem cells for clinical use. Collaborative work with Precision Functional and Regenerative Medicine; Internal funding: $4000; Approved by Texas State University IRB. Study status: Completed.

Phenotypic analysis of stem cells derived from human bone marrow. Sponsor: Precision Functional and Regenerative Medicine; Amount $3000; Status: Approved by Texas State University IRB. Study status: Completed

HONORS AND AWARDS

Honor Roll and Magna Cum Laude Graduate at The University of Texas Health Science Center at San Antonio.

Who's Who Among International Students in American Universities and Colleges.

Monetary award: Council of International Relations, 1986.

First Prize Winner in the pre-doctoral category, Young Investigator Award 13thAnnual Dental Symposium, 1994.

Young Investigator Travel Award. The Fifth International Conference on the Chemistry and Biology of Mineralized Tissues, 1995.

Young Investigator Award, International Association for Dental Research (IADR), 1998.

Young Investigator Award, The Fifth International Conference on the Chemistry and Biology of Mineralized Tissues, 1998.

PUBLICATIONS

1. H. Pedrozo and M. Sobol. Comparative CAZyme Genomics Reveals Convergent Functional Specialization and Host-Dependent Carbohydrate Metabolism in Three Phylogenetically Distant Bacterial Symbionts. In preparation
2. H. Pedrozo and M. Dumitrescu. Clinical use of Autogenous Mesenchymal Stem Cells and VSELs for the treatment of musculoskeletal conditions. In preparation
3. Brodke D, Pedrozo HA, Kapur TA, Attawia M, Kraus KH, Holy CE, Kadiyala S, and Bruder SP. Bone grafts prepared with selective cell retention technology heal canine segmental defects as effectively as autograft. J Ortho Res, 2006 May; 24(5):857-66.
4. Moore DC, Pedrozo HA, Crisco JJ 3rd, Ehrlich MG. Preformed grafts of porcine small intestine submucosa (SIS) for bridging segmental bone defects. J Biomed Mater Res A. 2004 May 1;69(2):259-66.
5. Schwartz Z, Pedrozo HA, Sylvia VL, Gomez R, Dean DD, Boyan BD. 1alpha, 25-$(OH)_2$D3 regulates 25-hydroxyvitamin D3 24R-hydroxylase activity in growth zone costochondral growth plate chondrocytes via protein kinase C. Calcif Tissue Int. 2001 Dec;69(6):365-72.
6. Wiederhold ML, Pedrozo HA, Harrison JL, Hejl R, Gao W. Development of gravity-sensing organs in altered gravity conditions: opposite conclusions from an amphibian and a molluscan preparation. J Gravit Physiol.

1997 Jul;4(2):P51-4.

7. Pedrozo HA, Schwartz Z, Robinson M, Gomes R, Dean DD, Bonewald LF, Boyan BD. Potential mechanisms for the plasmin-mediated release and activation of latent transforming growth factor-beta1 from the extracellular matrix of growth plate chondrocytes. Endocrinology. 1999 Dec;140(12):5806-16.
8. Pedrozo HA, Schwartz Z, Rimes S, Sylvia VL, Nemere I, Posner GH, Dean DD, Boyan BD. Physiological importance of the 1,25(OH)$_2$D3 membrane receptor and evidence for a membrane receptor specific for 24,25(OH)$_2$D3. J Bone Miner Res 1999 Jun; 14(6):856-67.
9. Boyan BD, Sylvia VL, Dean DD, Pedrozo H, Del Toro F, Nemere I, Posner GH, Schwartz Z. 1,25-(OH)$_2$D3 modulates growth plate chondrocytes via membrane receptor-mediated protein kinase C by a mechanism that involves changes in phospholipid metabolism and the action of arachidonic acid and PGE2. Steroids 1999 Jan-Feb;64(1-2):129-36. Review.
10. Pedrozo HA, Schwartz Z, Mokeyev T, Ornoy A, Xin-Sheng W, Bonewald LF, Dean DD, Boyan BD. Vitamin D3 metabolites regulate LTBP1 and latent TGF-beta1 expression and latent TGF-beta1 incorporation in the extracellular matrix of chondrocytes. J Cell Biochem 1999 Jan 1;72(1):151-65.
11. Pedrozo HA, Boyan BD, Mazock J, Dean DD, Gomez R, Schwartz Z. TGFbeta1 regulates 25-hydroxyvitamin D3 1alpha- and 24-hydroxylase activity in cultured growth plate chondrocytes in a maturation-dependent manner. Calcif Tissue Int 1999 Jan; 64(1):50-6.
12. Pedrozo HA, Schwartz Z, Gomez R, Ornoy A, Xin-Sheng W, Dallas SL, Bonewald LF, Dean DD, Boyan BD. Growth plate chondrocytes store latent transforming growth factor (TGF)-beta 1 in their matrix through latent TGF-beta 1 binding protein-1. J Cell Physiol 1998 Nov; 177(2):343-54.
13. Nemere I, Schwartz Z, Pedrozo H, Sylvia VL, Dean DD, Boyan BD. Identification of a membrane receptor for 1,25-dihydroxyvitamin D3 which mediates rapid activation of protein kinase C. J Bone Miner Res 1998 Sep; 13(9):1353-9.
14. Pedrozo HA, Schwartz Z, Dean DD, Harrison JL, Campbell JW, Wiederhold ML, Boyan BD. Evidence for the involvement of carbonic anhydrase and urease in calcium carbonate formation in the gravity-sensing organ of *Aplysia californica*. Calcif Tissue Int. 1997 Sep;61(3):247-55.
15. Pedrozo HA, Schwartz Z, Luther M, Dean DD, Boyan BD, Wiederhold ML. A mechanism of adaptation to hypergravity in the statocyst of *Aplysia californica*. Hear Res. 1996 Dec 1;102(1-2):51-62.
16. Pedrozo HA, Schwartz Z, Dean DD, Wiederhold ML, Boyan BD. Regulation of statoconia mineralization in *Aplysia californica in vitro*. Connect Tissue Res. 1 996;35(1-4):317-23.
17. Pedrozo HA, Schwartz Z, Nakaya H, Harrison JL, Dean DD, Wiederhold ML, Boyan BD. Carbonic anhydrase is required for statoconia homeostasis in organ cultures of statocysts from *Aplysia californica*. J Comp Physiol [A]. 1995 Oct;177(4):415-25.
18. Pedrozo HA, Wiederhold ML. Effects of hypergravity on statocyst development in embryonic *Aplysia californica*. Hear Res. 1994 Sep;79(1-2):137-46.

Abstracts and presentations at professional meetings (not listed here)

PATENTS

1. Tissue scaffolds. ID: US-2019365950-A1. Assignee: Kci Licensing, Inc. Authors: Hugo Pedrozo, Edward S. Griffey, Christopher Kaufmann. Priority Date: 8/14/08 https://patents.google.com/patent/US20190365950A1/en

2. Joint resurfacing orthopaedic implant and associated method. ID: US-7595062-B2. Assignee: Depuy Products, Inc.. Authors: Hugo A. Pedrozo, Matthew N. Widmer. Priority Date: 7/28/05https://patents.google.com/patent/US7595062B2/en

3. Suture anchor cartridge holder, suture anchor cartridge and associated method ID: US-2007100350-A1.. Assignee: DePuy Products, Inc. Authors: Daren Deffenbaugh, Hugo Pedrozo, Matthew Biss. Priority Date: 10/31/05 https://patents.google.com/patent/US20070100350A1/en

4. A method of organizing an assembly of collagen fibres and compositions formed therefrom. ID: EP-1674500-A2. Assignee: DePuy Products, Inc. Authors: Hugo A Pedrozo, Mark Shuster. Priority Date: 12/22/04 https://patents.google.com/patent/EP1674500A2/en

5. Bone induction system and methods. ID: US-11419961-B2. Assignee: Vivex Biologics Group, Inc. Authors: Hugo Pedrozo. Priority Date: 12/18/08 https://patents.google.com/patent/US11419961B2/en

6. Bone cement compositions for use as growth factor carriers and methods of making same. ID: WO-2009110917-A1. Assignee: Osteotherapeutics, L.L.C. Authors: Hugo Pedrozo, Shuliang Li. Priority Date: 6/7/07 https://patents.google.com/patent/WO2009110917A1/en

7. Orthopaedic implant for vascularization of the femoral head. ID: EP-1676538-A1. Assignee: DePuy Products, Inc. Authors: Hugo A. Pedrozo, Mark Heldreth. Priority Date: 12/30/04 https://patents.google.com/patent/EP1676538A1/en

8. Self-assembling protein matrix prepared from natural extracellular matrices. ID: EP-1674116-A2. Assignee: DePuy Products, Inc. Authors: Hugo A. Pedrozo, Mark Shuster. Priority Date: 12/22/04 https://patents.google.com/patent/EP1674116A2/en

9. Injectable calcium phosphate cements formulated with bioactive agents and methods for making same. ID: WO-2009108934-A2. Assignee: Osteotherapeutics, L.L.C. Authors: Hugo Pedrozo, Shuliang Li. Priority Date: 2/28/08 https://patents.google.com/patent/WO2009108934A2/en

10. UV device for treating osteolysis. ID: WO-2006041670-A2. Assignee: Depuy Spine, Inc. Authors: Thomas M. Dimauro, Mohamed Attawia, Chantal Holy, Hugo Pedrozo, Jeffrey K. Sutton. Priority Date: 10/8/04 https://patents.google.com/patent/WO2006041670A2/en

11. Method and apparatus for impregnating porous biomaterials with bioactive agents. ID: WO-2009108935-A2. Assignee: Osteotherapeutics, L.L.C. Authors: Mark Shuster, Hugo Pedrozo, Kevin Brand. Priority Date: 2/28/08 https://patents.google.com/patent/WO2009108935A2/en

12. Multiple suture anchor delivery device, suture anchor delivery kit and associated method. ID: US-2007100351-A1. Assignee: DePuy Products, Inc. Authors: Daren Deffenbaugh, Hugo Pedrozo, Matthew Biss. Priority Date: 10/31/05 https://patents.google.com/patent/US20070100351A1/en

13. Device and method for fabricating cellularized implants with a predetermined architecture at the point of care. ID: US-8496642-B2. Assignee: OrthoBiomedical, Llc. Authors: Hugo Antonio Pedrozo. Priority Date: 6/23/09 https://patents.google.com/patent/US8496642B2/en

14. Cartridge suture anchor delivery device, suture anchor delivery device and associated method. ID: US-2007100352-A1. Assignee: DePuy Products, Inc.. Authors: Daren Deffenbaugh, Hugo Pedrozo, Matthew Biss. Priority Date: 10/31/05 https://patents.google.com/patent/US20070100352A1/en

15. Composition and system for wound decontamination. ID: US-8357115-B2. Assignee: Depuy Products, Inc. Authors: II Edward F. Arscott, Irina Ganopolsky, George L. Grobe, Mark A. Heldreth, Joseph J. Librizzi, Hugo

A. Pedrozo. Priority Date: 7/8/05 https://patents.google.com/patent/US8357115B2/en

16. Flowable osteogenic and chondrogenic compositions. ID: WO-03043576-A3. Assignee: Depuy Products Inc. Authors: Pamela Lynn Plouhar, Scott Bruder, Rhonda Clarke, Hugo Pedrozo. Priority Date: 11/20/01 https://patents.google.com/patent/WO2003043576A3/en

17. Th2-inducing adjuvant treatment for osteolysis. ID: WO-2006065420-A2. Assignee: Depuy Spine, Inc. Authors: Thomas M. Dimauro, Mohamed Attawia, Chantal Holy, Hugo Pedrozo. Priority Date: 12/17/04 https://patents.google.com/patent/WO2006065420A2/en