

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors in the order listed on Form Page 2.
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NAME David Pienkowski, PhD, MBA		POSITION TITLE Associate Professor of Biomedical Engineering and Orthopaedic Surgery	
eRA COMMONS USER NAME (credential, e.g., agency login) Pienkowski			
EDUCATION/TRAINING (Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable.)			
INSTITUTION AND LOCATION	DEGREE (if applicable)	MM/YY	FIELD OF STUDY
Villanova University	BS	1972-76	Physics
University of Pennsylvania	MSE	1976-78	Bioengineering
University of Pennsylvania	Ph.D.	1978-82	Matls Science & Eng.
Wharton School, University of Pennsylvania	M.B.A.	1984-87	Management

A. Personal Statement

The goal of the proposed study is to determine if long-term use of bisphosphonates is associated with changes in bone quality. My role in this timely and important proposal is to contribute engineering expertise needed by the research design. I will be responsible for the design, conduct, and interpretation of experiments which quantify changes to the material and mechanical properties of bone that are potentially altered by exposure to bisphosphonate therapy. My role in this project is to: 1) collaborate with the Principal Investigator and investigative team regarding experimental design, conduct, acquisition and reduction of data from both the proposed infrared spectroscopy and nanoindentation procedures. 2) participate in weekly meetings of the research team during which time recent publications/conference information and new data are reviewed, 3) mentor the post-doctoral fellow and supervise his laboratory performance. 4) collaborate with statistician Constance Wood, PhD to regarding development of mathematical models to fit the data, and 5) champion the preparation of abstracts, conference presentations, peer-reviewed manuscripts, and reports. I look forward with anticipation to contributing my three decades of experience in Orthopaedic bioengineering and apply my expertise in bone materials and musculoskeletal mechanics to work with the PI and his team on this exciting and significant healthcare problem.

B. Positions and Honors**Positions**

1982 - 1987	Director of R&D, Orthopaedic Products, La Jolla Technology, Inc., San Diego, CA
1987 - 1989	Vice President of Clinical Research, LTI Biomedical, Inc., San Diego, CA
1984 - 1991	Adj Asst Prof. of Orthopaedic Surgery Research, School of Medicine, Univ. of Pennsylvania
1989 - 1989	Vice President of Research, IatroMed, Inc., Phoenix, AZ
1991 - 1997	Assistant Professor of Biomedical Engineering, University of Kentucky, Lexington, KY
1991 - 1997	Assistant Professor of Orthopaedic Surgery, School of Medicine, University of Kentucky
1996 - 1997	Board of Directors & Research Committee, Kentucky Spine Institute, Lexington, KY
1991 - 2000	Director, Orthopaedic Biomechanics Laboratory, University of Kentucky, Lexington, KY
1997 - Present	Associate Professor of Biomedical Engineering, University of Kentucky
1997 - Present	Associate Professor of Orthopaedic Surgery, School of Medicine, University of Kentucky

Honors

2006	Ignatio Ponseti Scientific Poster Award
2007	Society for Biomaterials, Mentor of student receiving Honorable Mention Recognition Award
2008	American Academy of Orthopaedic Surgeons, co-author of best hand research poster

Professional Memberships and Other Experience

1982 - 2004	Society for Biomaterials
1983 - Present	Orthopaedic Research Society
1997 - Present	American Society for Bone and Mineral Research
1997 - 2009	Member, NIH Orthopaedic Clinical Sciences Special Emphasis Panel
2000 - 2004	Scientific Advisory Board, Shriners Hospital for Children, Lexington, KY
2001 - Present	American Academy of Forensic Scientists (Fellow, Engineering Section)
2015 - 2017	AAFS Scientific Sessions Program Chair
2001	Invited Chair, Carbon in Biomaterials Symposium, Lexington, KY
2003 - 2006	Chairman, NIH Orthopaedic Clinical Sciences Special Emphasis Panel
2003 - 2009	Reviewer, National Medical Research Council of Singapore
2003 - 2016	Editorial Board, Journal of Orthopaedic Trauma
2006 - 2016	Section (Biomechanics) Editor, Journal of Orthopaedic Trauma

C. Selected Peer-reviewed Publications

Most Relevant

1. **Pienkowski D**, Wood C, Malluche HH. Bisphosphonate treatment duration and Young's modulus of human trabecular bone. In review by the Journal of Bone and Mineral Research January 2017
2. Ward JJ, Wood C, Rouch K, **Pienkowski D**, Malluche HH. Stiffness and strength of bone in osteoporotic patients treated with varying durations of oral bisphosphonates. *Osteoporosis International*. 27(5), 2681 – 2688, 2016
3. Malluche HH, Porter DS, **Pienkowski D**. Evaluating Bone Quality in Patients with Chronic Kidney Disease. Invited manuscript. *Nature Reviews Nephrology*. November 9(11):671-680, 2013
4. Malluche HH, Porter DS, Mawad H, Faugere MC, **Pienkowski D**. Low-energy fractures without low BMD t-scores of osteoporosis: a bone matrix disorder. *Journal of Bone and Joint Surgery (Am)* October 2;95 (19) 2013
5. Malluche HH, Porter DS, Monier-Faugere MC, Mawad H, **Pienkowski D**. Differences in Bone Quality between High versus Low Turnover Renal Osteodystrophy. *Journal of the American Society of Nephrology* 23(3):525-32, 2012

Most Recent

1. Ward JJ, Wood C, Rouch K, **Pienkowski D**, Malluche HH. Stiffness and strength of bone in osteoporotic patients treated with varying durations of oral bisphosphonates. *Osteoporosis International*. 27(5), 2681 – 2688, 2016
2. Malluche HH, Porter DS, **Pienkowski D**. Evaluating Bone Quality in Patients with Chronic Kidney Disease. Invited manuscript. *Nature Reviews Nephrology*. November 9(11):671-680, 2013
3. Malluche HH, Porter DS, Mawad H, Faugere MC, **Pienkowski D**. Low-energy fractures without low BMD t-scores of osteoporosis: a bone matrix disorder. *Journal of Bone and Joint Surgery (Am)* October 2;95 (19), 2013
4. Cabell L, **Pienkowski D**, Shapiro R, Janura M. "Effect of Age and Activity Level on Lower Extremity Gait Dynamics: An Introductory Study". *Journal of Strength and Conditioning Research* 27(6):1503-1510, 2013
5. Malluche HH, Porter DS, Monier-Faugere MC, Mawad H, **Pienkowski D**. Differences in Bone Quality between High versus Low Turnover Renal Osteodystrophy. *Journal of the American Society of Nephrology* 23(3):525-32, 2012

Most Significant

1. Malluche HH, Porter DS, **Pienkowski D**. Evaluating Bone Quality in Patients with Chronic Kidney Disease. Invited manuscript. Nature Reviews Nephrology. November 9(11):671-680, 2013
2. Malluche HH, Porter DS, Mawad H, Faugere MC, **Pienkowski D**. Low-energy fractures without low BMD t-scores of osteoporosis: a bone matrix disorder. Journal of Bone and Joint Surgery (Am) October 2;95 (19), 2013
3. Mattingly B, Talwalkar V, Tylkowski C, Stevens DB, Hardy PA, **Pienkowski D**. Three-dimensional In Vivo Motion of Adult Hindfoot Bones. Journal of Biomechanics 39(4): 726-733, 2006
4. **Pienkowski D**, Pollack SR, Brighton CT, Griffith NJ. Low-Power Electromagnetic Stimulation of Osteotomized Rabbit Fibula: A Randomized, Blinded Study. J Bone Joint Surg 76A(4): 489-501, 1994
5. **Pienkowski D**, Pollack SR. The Origin of Stress-Generated Potentials in Fluid-Saturated Bone. J Ortho Res, 1:30-41, 1983

D. Research Support

Ongoing Research Support

Pending Research Support

Completed Research Support

Finite Element Analysis of Bisphosphonate Treated Bone

NIH-NIAMS (supplement to RO1061578). \$150,000, 7/1/13-6/31/14

This research supplemented the parent award (below) and contributed a three-dimensional modeling of trabecular bone from which finite element models were built to enable estimates of bone modulus and strength
Role: co-investigator

Bisphosphonates and Bone Quality

NIH-NIAMS, R01AR061578, \$1,500,000, 7/1/12-6/30/16 (extended to 6/30/17)

This multi-year research endeavor seeks to comprehensively quantify the changes in human bone quality accompanying varying duration of bisphosphonate treatment in Caucasian females with osteoporosis

Bone Cement for 21st Century Arthroplasty

Kentucky Science and Technology Corporation: \$100,000 1/1/09-12/31/10

This research seeks to evaluate the efficacy of multiwall carbon nanotubes regarding their ability to conduct heat in bone cement, reduce bone cement temperature, preserve periprosthetic cell viability, and permit heat labile antibiotics to be used in revision total joint arthroplasty to prevent infection.

Role: PI

A Novel Biomechanical Approach for Preventing Spinal Disorders

Kentucky Science and Technology Corporation: \$100,000 1/1/09-12/31/10

This research seeks to evaluate the hypothesis that altered gait patterns induce supra-normal load amplitudes in the vertebrae which predispose select patients to fatigue failure and progressive kyphotic spinal deformities.

Role: Collaborator