

Catherine G. Ambrose, PhD

UNDERGRADUATE EDUCATION:

May 1987 B.S. Washington University in St. Louis
Mechanical Engineering

GRADUATE EDUCATION:

Aug. 1989 M.S. University of Texas at Austin
Biomedical Engineering

Dec. 1992 Ph.D. University of Texas at Austin
Mechanical Engineering

ACADEMIC APPOINTMENTS:

The University of Texas Health Science Center at Houston
Department of Orthopaedic Surgery
Title: Associate Professor
September 2005 to present

The University of Texas InterInstitutional Department of
Biomedical Engineering
Title: Adjoint Associate Professor
January 2008- present

The University of Texas Health Science Center at Houston,
Graduate School of Biomedical Sciences
Title: Regular Faculty Member
February 2010- present

The University of Texas Health Science Center at Houston
Title: Assistant Professor
October 1993 to 2005

Shriners Hospitals for Children – Houston
Title: Scientific Staff
September 2004 to present

Rice University
Title: Adjunct Associate Professor in Biomedical
Engineering, July 2009 - present
Title: Visiting Assistant Professor in Mechanical
Engineering, January 1999 to 2004
Title: Lecturer, Mechanical Engineering, January 1996 to
December 1998

**PROFESSIONAL
ORGANIZATIONS:**

Local

Houston Society for Engineering in Medicine and Biology
Steering Committee (2003-2009)

Poster Chairman for the Annual Meeting (2002-
2005)

Houston Musculoskeletal Research Group (2001-present)

Member of the steering committee (2001-present)

International

Orthopaedic Research Society

elected membership, 1996-present

American Society of Bone and Mineral Research

elected membership, 2000-present

Biomedical Engineering Society, 2010-present

HONORS & AWARDS: Nominated for the President's Mentoring Award for
Faculty, UTHSC-Houston, 2004 and 2011.

Kiebzak GM, Beinart GA, Perser K, **Ambrose C**, Siff SJ,
Heggeness MH: Undertreatment of osteoporosis in men
with hip fracture. *Outstanding Clinical Abstract* at the
Annual Meeting of the International Society for Clinical
Densitometry, Atlanta, GA, 2002.

Supervisor, Mark Timmer, recipient of a Natural Sciences
and Engineering Research Council Fellowship, 2000-2002

Supervisor, Gloria Gogola, finalist for the Smith and
Nephew Resident Research Award, 1998

Tau Beta Pi – National Engineering Honor Society, 1987

BSME cum laude – Washington University, 1987

Pi Tau Sigma – National Mechanical Engineering Honor
Society, 1986

Jerome J. Spector Memorial Scholarship – 1985-1987

National Merit Scholar – 1983-1987

COMMITTEES:

Medical School

Faculty Senate, 1994-2000; 2004-2010

Interviewer, Medical Student Applicants, 1997-present

Association of Women Faculty, 2000-2006

Program chairman 2002-2003

President-elect 2003-2004

President 2004-2005
Animal Welfare Committee, 2002-present
Vice-Chair, 2009-present
Institutional Anatomical Oversight Review Committee
(IAORC), 2003-present

Department of Orthopaedic Surgery

Director, Biomechanics Laboratory, 1995-present
Director, Bone Histomorphometry Laboratory,
1999-present
Director, Bone Densitometry Laboratory, 1999-present
Research Committee, 1994-present
Orthopaedic Education Council, 1999-present
Departmental Promotions Committee 2000-present
Ed. T. Smith Lectureship Committee, 2002-present

InterInstitutional Department of Biomedical Engineering

Graduate Studies Committee, 2009-present

Curriculum Committee, 2006-present

Advisory Board for STEP-UP, MDACC's clinical and
research internship for science, technology, and
engineering students, 2008-present

SERVICE TO THE COMMUNITY:

Lakeview Quilt Guild, Community Service Chairperson,
1999-2001

Clear Creek Independent School District, Brookwood
Elementary Campus Instructional Improvement Council,
2004-2006

SPONSORSHIP OF CANDIDATES FOR POSTGRADUATE DEGREE:

Masters Student:

Karen Gomez, The University of Texas Health Science
Center at Houston, Graduate School of Biomedical
Sciences, Degree Awarded August 2010, committee
member. Thesis title "Identification of the Causative
Bacteria in Muscular Skeletal Infections Using 16S rRNA
Gene Detection."

Evan Johnson, The University of Texas Health Science
Center at Houston, Graduate School of Biomedical
Sciences, Degree Awarded August 2003, committee
member. Thesis title "Use of Micro-CT in Comparison
with DEXA for Rat Osteoporosis".

Nicole Meyers, Texas A & M University, degree awarded in Biomedical Engineering, December, 1999, primary supervisor. Thesis title "Bone Quality Assessment Using Multiple Methods".

Doctoral Student:

Ivana Peralta, Rice University, PhD Candidate
Chemistry, 2006-2009, committee member. Dissertation title "In vivo Studies of C₆₀-Bisphosphonate-Beta-Blocker Conjugate for the Prevention and Treatment of Osteoporosis".

Honsoo Park, Rice University, PhD Candidate
Biomedical Engineering, 2004-2007, committee member. Dissertation title "Injectable Cell/Hydrogel Composites for Articular Cartilage Tissue Engineering".

Theresa Holland, Rice University, Ph.D. Candidate,
Biomedical Engineering, 2003-2006, committee member. Dissertation title "Controlled Growth Factor Delivery from Biodegradable Hydrogel Scaffolds for Articular Cartilage Repair".

Mark Timmer, Rice University, Ph.D. Candidate,
Biomedical Engineering, 1999-2003, primary supervisor. Dissertation title "Development of Biodegradable Interbody Fusion Device".

SPONSORSHIP OF POSTDOCTORAL ORTHOPAEDIC RESEARCH FELLOWS:

Michael Miranda, MD (July 2009 – March 2010)

Michael Moghimi, MD (July 2008 – June 2009)

Roberto Diaz, MD (July 2006 – June 2008)

Joerg Mika, MD (July 2005 – April 2007)

Yu-qing Zhang, PhD (July 2005 – October 2006)

Brian Bracy, MD (July 2005 – June 2006)

Harjinder Bajwa, MD (July 2005 – June 2006)

Alex Betch, MD (July 2005 – June 2006)

Christopher Godlewski, M.D. (July 2004-June 2005)

Aaron Bott, M.D. (July 2004 – June 2005)

Robert Ordonez, M.D. (July 2003-May 2004)
Fabienne Moore, M.D. (July 2002-June 2003)
Volkan Guzel, M.D. (July 2001-June 2002)
Craig Glauser, M.D. (July 2000-June 2002)
Eric Lewis, M.D. (July 2000-June 2001)
Keith Loudon, M.D. (June 2000-December 2000)
E. Peter Sabonghy, M.D. (July 1999-June 2000)
Richard Beaver, M.D. (July 1998-June 1999)
Joe Cohn, M.D. (July 1997-June 1998)
Gloria Gogola, M.D. (July 1996-June 1997)

SPONSORSHIP OF RESEARCH STUDENTS:

Undergraduate Students: Rodrigo Campana, “*Bone Mineral Density Assessment after Spinal Cord Injury*”, summer 2009

 Luis Iglesias, “*Mechanical Strength of Bone after Spinal Cord Injury*”, summer 2009

 David Shau “*Bone Mineral Density Assessment Using Different Techniques*”, summer 2008

 Vani Rajendran, “*Biphasic Effect of NSAIDs on Osteoblasts Function*”, summer 2008

 Erika Virginia Zabre Gonzalez “*Evaluation of Bony Ingrowth into a Porous Metal Implant by Means of Color Imaging*”, summer 2006

 David Irwin, “*Biomechanical Testing of Perarticular Locking Plate*”, summer 2005

 Huay-Zong Law, “*Orthopaedic Biomechanics*”, summer 2005

 Allison Hall, “*Grading Implant Wear Using Radiographs*”, summer 2003, summer 2004

 Steven Schroder, “*Assessing Fracture Healing Using Quantitative Ultrasound (QUS), Mechanical Response Tissue Analysis (MRTA), and Dual Xray Absorptiometry (DXA): Phase I*”, summer 2002

 Lidia Malyszko, “*Comparison of Acetabular Fixation Techniques*”, summer 2001.

 Angela Peng, “*A New Biodegradable Vehicle for Antibiotic Delivery for Osteomyelitis*”, summer 1998.

Medical Research Students:

Tiffany Tezino, “*Verification of 16S rRNA-Denaturing Gradient Gel Electrophoresis (DGGE) Analysis of Diabetic Infections by Molecular Cloning*”, summer 2010.

James Shaw, “*Examination of the Eradication of Existing Staphylococcus aureus Biofilms by Exposure to Silver Nanodressing in an In Vitro Infection Model*”, summer 2010.

David Doherty, “*Vitamin D Levels and Osteomyelitis: Is There a Relationship?*”, summer 2010.

Brian Stover, “*Comparison of Biofilm Formation on Different Biomaterials in an in vitro Diabetic Joint Model*”, summer 2010, 3rd Place winner of Weber Prize

Justin Miranda, “*In Vivo Persistence of DNA after Bacterial Cell Death*”, summer 2009

Alan Blankenship, “*Assessment of Port a Cul System for the Collection of Infected Tissue Specimens Containing Anaerobic Bacteria*”, summer 2008, 1st place winner of the Weber Prize

Paige Cohick, “*Visualization of Staphylococcus aureus after Osteoblast Invasion*”, summer 2008

Shawn Funk, “*An In Vitro Model for Biofilm Infections in Diabetic Foot Ulcers*”, summer 2007, 1st place winner of the Webber Prize

Matthew Jordan, “*Identification of Causative Bacteria in Diabetic Foot Infections by 16S rRNA Sequencing*”, summer 2007

Ken Estrera, “*Orthopaedic Complications in Diabetic College Athletes: a retrospective analysis*”, summer 2006, 2nd place winner of the Webber Prize

Steven Winslow, “*An In Vitro Model for Biofilm Infections on Orthopaedic Implants*”, summer 2006

Brian Deuell, “*Immunolocalization of Cyclooxygenase Isoenzymes During Osteointegration and the Effects of*

NSAIDs on Bony Integration: Defining and Developing and Animal Model", summer 2005

Julia Shields, "*Evaluation of Antibiotic Impregnated Microspheres*", summer 2005

Michael Greaser, "*Rapid and Sensitive 16SrRNA Analysis of infecting Organisms in Osteomyelitis*", summer 2005

Paul Dahm, "*PLGA-Peg Antibiotic Microspheres: The Use of Vancomycin, Gentamicin and Cefazolin Containing Microspheres in the Treatment of Osteomyelitis: An In-Invitro Study*", summer 2003

Devin Reed, "*Comparison of DXA, Sunlight Omnisense 7000S QUS and Mechanical Test Results in Cadaver Long Bones*", summer 2003

Stacey Martin, "*Is Fracture Risk Assessment Dependent on the Type of QUS Technology Used?*", summer 2003

Robert Fullick, "*Glenohumeral Translation After Capsular Shrinkage with a Radio-Frequency Probe*", summer 2001.

Karen Perser, "*Outcome of Hip Fracture in Men*", summer 2001, 4th place winner of the Webber Prize

John Joseph, "*Comparison of PLGA/PEG Microspheres with PMMA Cement as an Antibiotic Carrier*", summer 2000.

John Wright, "*Comparison of IV antibiotic Therapy and Local Antibiotic Therapy Using a PLGA Carrier for Osteomyelitis Treatment*", summer 2000.

Stacy Beaty, "*Subtalar Instability Diagnosis Through Radiography*", summer 2000.

Michael L. Brennan, "*Effect of Ovariectomy, Indomethacin, and COX-2 Inhibitor on Bone PGE₂ Levels in Rats*", summer 1999.

Christopher C. Peterson, "*Resorbable Ceramic Bone Cements as Bone Substitute Materials: Evaluation Using a Critical-Size Defect in a Sheep Model*", summer 1999.

Timothy M. (Toby) Risko, “*Evaluation of Chondroitin Sulfate, Glucosamine and Intra-articular Hyaluronic Acid on Cartilage Healing*”, summer 1998.

Anthony D. (Tony) Mancuso, “*The Effect of Fibrin Glue on Blood Loss During Total Hip Arthroplasty in Dogs*”, summer 1998.

Resident Research Students: Kristine Banks, MD, “*Locking Plate Fixation of Patella Fractures: A Biomechanical Study*”, 2011.

Dean Dominy, MD, “*Utility of Versajet in Removing Biofilm from Orthopaedic Hardware*”, 2011.

Ryan Veurink, MD, “*Tensioned Locking Loop Krackow Suture Fixation of Achilles Tendon Ruptures, a biomechanical comparison*”, 2010.

Harris Rose, MD, “*The Effect of Nicotine on Fracture Healing: Primary Bone Healing Versus Enchondral Ossification*”, 2008

Winfield Campbell, MD, “*Biomechanical Evaluation of Anatomic Contoured Locking Plates for Periarticular Fractures*”, 2008

Stacy Beaty, MD, “*Evaluation of Outcomes After Fragility Fractures of the Hip*”, 2008

Craig Glauser, MD, “*The Fixation Strength of Suture Anchors and Bioabsorbable Interference Screws for Biceps Tenodesis*”, 2006

Vishal Shah, MD, “*A Biomechanical Comparison of Methods of Fixation for Distal Fibula Fractures in Osteoporotic Bone*”, 2006

Volkan Guzel, “*Biomechanical Comparison of 1-Pole vs 3-Pole Polyethylene Patellar Implant on Fracture Resistance*”, 2006

Jeremy Britten, M.D., “*Biomechanical Evaluation of Achilles Insertion Strength after Retrocalcaneal Exostectomy*”, 2005

Eric Lewis, M.D., "*Biomechanical Evaluation of Syndesmosis Screw Fixation*", 2005

Miguel Berastain, M.D., "*Effect of NSAIDs on Osteointegration*", 2004

Kamaram Aurang, M.D., "*Biomechanical Evaluation of Triple Pole Versus Single Pole Patella Design in TKA*", 2003.

Clifford DePrang, M.D., "*The Effects of Early Verses Delayed Weight Bearing After Uncemented Total Hip Arthroplasty*", 2001.

Gloria Gogola, M.D., "*The Effect of Ovariectomy and NSAIDs on Bone PGE2 Levels in Rats*", 2001.

Laura Torres, M.D., "*Fibular Fixation in Distal Tibia/Fibula Fractures*", 2001.

Matt Warnock, M.D., "*Calculation of the Optimal Opening Wedge Low Tibial Osteotomy*", 2001.

Dhiren Sheth, M.D., "*Total Knee Arthroplasty in Hemophilia*", 2000

James Parker, M.D., "*Compartment Pressures in Arthroscopically Assisted Tibial Plateau Fractures: A Cadaveric Study*", 2000.

Keith Louden, M.D., "*Tendon Transfer Fixation in the Foot and Ankle: A Biomechanical Study Evaluating Two Sizes of Bioabsorbable Screws*", 2000.

Duc P. Vo, M.D., "*Continuous Subacromial PCA Infusion for Postoperative Pain Control After Shoulder Arthroscopy*", 1999.

Michael A. Andreo, M.D., "*Examination of the Sacroiliac Joint and its Influence on the L5-S1 Interspace*", 1996.

Shawn M. Figari, M.D., "*Sacroiliac Arthrodesis*", 1996.

Thomas S. Beck, M.D., "*Acetabular Component Position and the Effect on Hip Stability and Range of Motion*", 1996.

Michael Andreo, M.D., “*Accuracy and Reliability of Radiographic Analysis in Total Hip Arthroplasty*”, 1995.

Robert C. Kramer, M.D., “*The Effect of Wrist, MCP Joint, and IP Joint Position on Extensor Tendon Tension*”, 1995.

TEACHING RESPONSIBILITIES:

UTHHSC: CORE lectures for Orthopaedic Residents

4-6 hour lectures per year

Basic Biomechanics, 1994-present

Research Methodology, 1998-present

UTHHSC: Orthopaedic Research Elective for Medical Students, (one month duration for 4th year medical students) 1999-present

UTHHSC: Summer Research Preceptorship, 1995-present

Rice University: Mechanics of Rigid Bodies, instructor

3 hours of lecture and 2 office hours per week

Spring 1998

Fall 1998

Rice University: Senior Design, participant, 1-2 hours per week mentoring a senior design group

1995-present

Rice University: Biomechanics of Human Movement,

instructor, 3 lecture and 2 office hours per week,

Designed entire course, including all lecture notes, exams, homework assignments, and labs

Spring 1996 – Spring 2003

University of Texas at Austin: Senior Design, participant,

1-2 hours per week mentoring a senior design group

2005-present

CURRENT GRANT SUPPORT:

Title: “The Role of Biofilm on Margin Stability and the Development of Secondary Caries”

Source: The National Institute of Dental and Craniofacial Research

PI: S. Ray Taylor, PhD

Co-I: Catherine Ambrose, PhD and Heidi Kaplan, PhD

9/1/2010-8/31/2014 \$1,519,214

Title: “Testing for Contrasting Infection Rates and Biofilm Formation Among Biomaterials in an *in vitro* Biofilm Infection Model”

Source: Stryker, Inc

PI: Catherine Ambrose, PhD

Co-I: Milan Sen, MD and Heidi Kaplan
1/1/2010-6/30/11 \$32,486

Title: "Resident and Fellow Research and Education"
Source: Zimmer, Inc
PI: Catherine Ambrose, Ph.D.
Co-PI: Dhiren Sheth, MD.
8/05/05-12/31/20 \$50,000

PAST GRANT SUPPORT: Title: "PC-NSAIDs: Gastrointestinal-safe and potent anti-inflammatory drugs"
Source: US Army SBIR Phase II
PI: PLX-Pharma
Subcontract: Catherine Ambrose, PhD (\$34,905 per year)
11/25/08-12/24/10 \$729,991.79

Title: "Bioengineering Masters Degree Program"
Source: Encore Medical
PI: Alex Rosenstein, MD
Co-PI: Catherine Ambrose, PhD
7/1/2008-6/30/2010 \$153,166

Title: "Identification of Causative Bacteria in Osteomyelitis Using Rapid and Sensitive 16SrRNA Detection"
Source: Orthopaedic Research & Education Foundation
PI: Catherine Ambrose, PhD
Co-I: Terry Clyburn, MD, Heidi Kaplan, PhD
7/01/07-6/30/10 \$150,000

Title: "PC-NSAIDs: Gastrointestinal-safe and potent anti-inflammatory drugs"
Source: US Army SBIR Phase I
PI: PLX-Pharma
Subcontract: Catherine Ambrose, PhD (\$7700)
11/11/07-6/10/08 \$69,997.08

Title: "Biomechanical Evaluation of Anatomic Contoured Locking Plates for Periarticular Fractures"
Source: Zimmer, Inc
PI: Catherine Ambrose, PhD
Co-I: Dhiren Sheth, MD
8/15/05-8/15/07 \$80,947

Title: "Evaluation of Trabecular Metal Implants and Biodegradable Microspheres Impregnated with BMP2"
Source: Zimmer, Inc

PI: Catherine Ambrose, PhD
Co-I: Dhiren Sheth, MD
4/16/06-12/19/07 \$214,633

Title: "Evaluation of Trabecular Metal Implants and Antibiotic Impregnated Microspheres in Osteomyelitis "
Source: Zimmer, Inc
PI: Catherine Ambrose, Ph.D.
Co-PI: Terry Clyburn, M.D.
7/01/05-7/27/07 \$119,770

Title: "Effects of NSAIDs on Osteointegration – Continuing Studies"
Source: Zimmer, Inc
PI: Catherine Ambrose, Ph.D.
Co-PI: Dhiren Sheth, MD.
7/01/05-7/27/07 \$88,615

Title: "Effects of NSAIDs on Osteointegration"
Source: Zimmer, Inc
PI: Catherine Ambrose, PhD
Co-I: Dhiren Sheth, MD
1/01/04-12/31/04 \$56,701

Title: "Development of a Trauma Database for a Level 1 Trauma Center in the Texas Medical Center"
Source: Zimmer, Inc
PI: Catherine Ambrose, PhD
Co-I: Kevin Coupe, MD
1/01/04-12/31/04 \$49,542

Title: "Orthopaedic Joint Loading and Implant Wear"
Source: Whitaker Foundation BME Seed Grant
PI: Richard Neptune, Ph.D.
Co-PI: Catherine Ambrose, Ph.D.
6/01/02-12/31/03 \$20,000

Title: "Bone Quality Assessment in Osteoporosis Using Dual-Energy Xray Absorptiometry and Ultrasound"
Source: The Women's Fund for Health Education and Research
PI: J. Lawrence Katz, Ph.D.
Co-PI: Catherine Ambrose, Ph.D.
1/01 – 12/01 \$7,000

Title: "Evaluation of Bone Substitute Material in a Critical-Size Defect in a Sheep Model"

Source: Biomet

PI: Catherine Ambrose, Ph.D.

9/98-12/00 \$157,362

Title: "The Effect of Ovariectomy and Indomethacin on Bone PGE₂ Levels in Rats"

Source: Orthopaedic Research and Education Foundation

PI: Catherine Ambrose, Ph.D.

7/99-12/00 \$15,000

Title: "The Effects of Fibrin Glue on Blood Loss During Total Hip Arthroplasty in Dogs"

Source: Centeon

PI: Terry A. Clyburn, M.D.

Co-PI: Catherine G. Ambrose, Ph.D.

5/98-12/98 \$23,458

Title: "Development of an Animal Model for Osteoporosis to Determine the Effect of NSAIDS on Post-Menopausal Bone Loss"

Source: Women's Fund for Health Education and Research

PI: Catherine G. Ambrose, Ph.D.

2/97-2/98 \$14,540

Title: "Correlating Bone Signals from Magnetic Resonance Imaging with Bony Material Properties"

Source: NASA Johnson Space Center

PI: Tim Harrigan, Sc.D.

Co-PI: Catherine G. Ambrose, Ph.D.

9/95 – 6/97 \$37,391

Title: "Kinematic Measurements in the Knee Using Magnetic Resonance Imaging"

Source: Resonex, Inc.

PI: J.D. Reuben, M.D.

Co-PI: Catherine G. Ambrose, Ph.D.

11/94 – 10/95 \$12,500

CURRENT CONTRACT SUPPORT:

PAST CONTRACT SUPPORT:

Biomet, Inc: Co-Investigator with Thomas Clanton, M.D.
6/98-5/08, \$100,000/year.

Rice University: Visiting Assistant Professor

1/99-6/2004, \$45,000 (cumulative).

Rice University: Lecturer,
1/96-12/98, \$39,000 (cumulative)

PUBLICATIONS:

Abstracts

1. **Ambrose, C.G.:** Graphical Simulation Environment for Locomotion Analysis, 12th Annual Houston Conference on Biomedical Engineering Research, Houston, February 1994.
2. **Ambrose, C.G.,** Daum, W.J., and Solvelius, P.E.: A Comparison of Contouring Techniques for Locating Bony Landmarks Using MR and CT Imaging, 13th Annual Houston Conference on Biomedical Engineering Research, Houston, February, 1995.
3. **Ambrose, C.G.,** Daum, W.J., Solvelius, P.E., Kulkarni, M., and Kaufman, B.: Validation of Bony Landmarks Derived From 3-D reconstructions of MR and CT Images, Transactions of the 41st Annual Meeting of the Orthopaedic Research Society, Volume 2:800, Atlanta, 1995.
4. Ambrose, R.O., and **Ambrose, C.G.:** Robot Models for Space Environments. Proceedings of the 1995 IEEE International Conference on Robotics and Automation, May 1995.
5. **Ambrose, C.G.,** Reuben, J.D., and Andreo, M.A.: Automatic Measurement System for Orthopaedic Applications – Total Hip Arthroplasty and Patello-Femoral Kinematics, Annual Fall Meeting of the Biomedical Engineering Society, Boston, 1995.
6. Kramer, R.C., Masson, M.V., and **Ambrose, C.G.:** The Effect of Wrist, MP and IP Joint Position on Extensor Tendon Tension, Annual Meeting of the American Association of Orthopaedic Surgeons, Atlanta, Georgia, 1996.
7. **Ambrose, C.G.** and Ambrose, R.O.: Non-Invasive Motion Measurement for Orthopaedic Kinematic Measurements, 14th Annual Houston Conference on Biomedical Engineering Research, Houston, February 1996.
8. Ambrose, R.O., and **Ambrose, C.G.:** Kinetics of Two-Handed Climbing Gaits in Zero Gravity, 14th Annual Houston Conference on Biomedical Engineering Research, Houston, February 1996.
9. **Ambrose, C.G.,** Ward, L., Masson, M., and Lavarro, F.: Viscoelastic Models of the Distal Radio-Ulnar Joint, 15th Annual Houston Conference on Biomedical Engineering Research, Houston, February, 1997.
10. Hogan, H., Lin, C., **Ambrose, C.G.,** Evans, H., Harrigan, T., Shackelford, L., and LeBlanc, A.: Relations Between Trabecular Bone Properties and MRI Relaxation Times, ASME IMECE97 Bioengineering Division Meeting, Dallas, Texas, November 16-21, BED Vol 36:325-326, 1997.
11. **Ambrose, C.G.,** Brennan, M., and Gogola, G.R.: Correlation of Mechanical Strength with Bone Loss in Ovariectomized Rat Model, Transactions of the Forty-Fourth Annual Meeting of the Orthopaedic Research Society, New Orleans, 1998.

12. **Ambrose, C.G.**, Gogola, G.R., Brennan, M.S.: The Effect of NSAIDs and Correlation of Mechanical Strength in Hormone-Deficient Osteoporosis, 16th Annual Houston Conference on Biomedical Engineering Research, Houston, April 1998.
13. **Ambrose, C.G.**, Gogola, G.R., Stancel, G.: Musculoskeletal Effects of Neonatal Exposure to Natural and Synthetic Estrogens, 17th Annual Houston Conference on Biomedical Engineering Research, Houston, 1999.
14. Gogola, G.R., **Ambrose, C.G.**, Mikos, A., Peng, A.: PLGA/PEG Microspheres as an Antibiotic Delivery System for Osteomyelitis, 17th Annual Houston Conference on Biomedical Engineering Research, Houston, 1999.
15. Timmer, M.D., He, S., Mikos, A.G., **Ambrose, C.G.**: Investigation of a Poly(Propylene Fumerate)-Based Polymer for Bioresorbable Interbody Fusion Cage, 18th Annual Houston Conference on Biomedical Engineering Research, Houston, 2000.
16. Gogola, G., **Ambrose, C.G.**, Peng, A., Mikos, A.: PLGA/PEG Microspheres as an Antibiotic Delivery System, 46th Annual Meeting of the Orthopaedic Research Society, Orlando, FL, March 11-14, 2000.
17. **Ambrose, C.G.**, Meyers, N., Beaver, R., Clyburn, T.A.: Evaluation of Resorbable Ceramic Bone Void Fillers Using a Critical-Size Defect in a Sheep Model, 18th Annual Houston Conference on Biomedical Engineering Research, Houston, 2000.
18. **Ambrose, C.G.**, Gogola, G., and Brennan, M.: The Effects of Indomethacin and Ibuprofen on Hormone-Deficient Bone Density Loss in an Ovariectomized Mature Rat Model, the World Congress on Osteoporosis 2000, Chicago, *Osteoporosis International* 11(Suppl 2):S170-S171, June 2000.
19. Sabonghy, P., **Ambrose, C.A.**, Wood, R.M., Clanton, T.O.: Tendon Transfer Fixation in the Foot and Ankle: Biomechanical Comparison of a Traditional Fixation Technique Verses Bioabsorbable Interference-Fit Screw Fixation, American Academy of Orthopaedic Surgeons Annual Meeting, San Francisco, 2001.
20. Loudon, K.W., Beaty, S.G., Clanton, T.O., **Ambrose, C.G.**: Tendon Transfer Fixation in the Foot and Ankle: A Biomechanical Study Evaluating Two Sizes of Bioabsorbable Screws, 19th Annual Houston Conference on Biomedical Engineering Research, Houston, 2001.
21. Clubb F, Peterson M, Coscio M, **Ambrose C**, Wolff R, Rossi A, Sedlik S, Rose B, Urban J, Buja M, McClay C. The Use of Integrated microscopic Techniques for Analyzing Implanted Vascular Stents. 21st Annual S&T Conference, 2001.
22. Timmer, M.D., **Ambrose, C.G.**, Mikos, A.G.: Quantification of the Crosslinking Density of Poly(Propylene Fumerate)-Based Biodegradable Networks, American Institute of Chemical Engineers Fall Meeting, 2001.
23. Timmer, M.D., He, S., **Ambrose, C.G.**, Mikos, A.G.: Mechanical Properties of Photo-Initiated Biodegradable Polymer Networks for Prefabricated Orthopaedic Scaffolds, Society for Biomaterials Annual Meeting, 2001.

24. Guzel VB, Kent M, **Ambrose C**, Koeck W, Schults J, Coupe KJ: Biomechanical Evaluation of Internal Fixation Techniques in Unstable Intertrochanteric Femur Fractures. The 8th Meeting of the International Society for Fracture Repair, Toronto, Ontario, Canada; 2002.
25. Kiebzak GM, Beinart GA, Perser K, **Ambrose C**, Siff SJ, Heggeness MH: Undertreatment of osteoporosis in men with hip fracture. Poster presentation at the Annual Meeting of the International Society for Clinical Densitometry, Atlanta, GA, 2002. *Journal of Clinical Densitometry* 5 (Supplement): S47. *This presentation won the "Outstanding Clinical Abstract" award.*
26. **Ambrose CG**, Kiebzak GM, Tabor OB, Peindl RD, Anderson RB, Davis WH, Clanton TO: Biomechanical testing of cadaveric specimens: importance of bone mineral density assessment. Poster presentation at the Annual Meeting of the International Society for Clinical Densitometry, Atlanta, GA, 2002. *Journal of Clinical Densitometry* 5 (Supplement): S47.
27. Guzel, V., Kent, M., **Ambrose, C**, Meyers, N. and Coupe, K: Biomechanical Evaluation of Internal Fixation Techniques in Unstable Intertrochanteric Femur Fractures. 20th Annual Meeting of the Houston Society for Engineering in Medicine and Biology, Houston, April 4, 2003.
28. Lemmon, H, Johnson, E, Cody, DD, **Ambrose, CG**, and Hogan, HA: Regional Variations in Cancellous BMD Within the Distal Metaphysis of the Rat Femur. American Society for Bone and Mineral Research, 2003 Annual Meeting, Minneapolis, Minnesota, *Journal of Bone and Mineral Research* 18(supplement2):S206-S207, 2003.
29. Clyburn, TA, **Ambrose, CG**, and Weitz-Marshall: Constrained Acetabulum – A Biomechanical, Cadaver-Model Study. 67th Annual Western Orthopaedic Association Annual Meeting, San Antonio, October 2003.
30. Clyburn, TA and **Ambrose, CG**: Antibiotic Microspheres for the Treatment and Prevention of Orthopaedic Infections. 67th Annual Western Orthopaedic Association Annual Meeting, San Antonio, October 2003.
31. Clyburn, TA and **Ambrose, CG**: Cement Injection into the Femur – An Improved Technique. 67th Annual Western Orthopaedic Association Annual Meeting, San Antonio, October 2003.
32. Martin, S, Kiebzak, GM, **Ambrose, CG**: Fracture Risk Assessment Discrepancy Among Three Quantitative Ultrasound Systems. International Society for Clinical Densitometry, 2004 Annual Meeting, Miami Florida, *Journal of Clinical Densitometry* 7(2):248, 2004.
33. Kiebzak, GM, Martin, S., and **Ambrose, CG**: Comparing Precision Values: Impact of Study Design and Statistical Techniques. International Society for Clinical Densitometry, 2004 Annual Meeting, Miami Florida, *Journal of Clinical Densitometry* 7(2):248, 2004
34. Kiebzak, GM, **Ambrose, CG**, Schmeer, P: Insoluble Intestinal Calcium Complexes May Affect Monitoring but Not Diagnosis. International Society for Clinical Densitometry, 2004 Annual Meeting, Miami Florida, *Journal of Clinical Densitometry* 7(2):239, 2004
35. Huang, RP, **Ambrose, CG**, Sullivan, E., Haynes, R.J.: Functional Significance of DEXA Measurements in Patients with Osteogenesis

- Imperfecta. Poster presentation at the Pediatric Orthopaedic Society of North America (POSNA) Annual Meeting, St. Louis, MO, April 29, 2004.
36. Clyburn, TA, Winston, L, DePrang, C, Sheth, D, and **Ambrose, CG**: Weightbearing on an Uncemented Total Hip Arthroplasty: A Prospective Comparison of Weight Bearing as Tolerated vs. Touch Down Only by Subsidence Measurement. Western Orthopaedic Association 68th Annual Meeting, San Francisco, September 29- October 2, 2004.
 37. Clyburn, TA, Adams, B, **Ambrose, CG**, and Ordonez, R: A Comparative Study of Imageless Navigation vs. Mechanical Alignment in Total Knee Arthroplasty: A Cadaveric Study. Western Orthopaedic Association 68th Annual Meeting, San Francisco, September 29- October 2, 2004.
 38. Keibzak, GM and **Ambrose, CG**: Axial and Transverse Transmission Quantitative Ultrasound may Selectively Assess Material and Structural Properties of Bone. Poster presented at The American Society for Bone and Mineral Research, Annual Meeting, Seattle, Washington, October 2004.
 39. Johnson, EM, **Ambrose, CG**, Hogan, H, Cody, DD: Use of MicroCT in Comparison with DEXA for Rat Osteoporosis. Poster presented at The American Society for Bone and Mineral Research, Annual Meeting, Seattle, Washington, October 2004.
 40. Huang, R, **Ambrose, CG**, Sullivan, E, and Haynes, R: Functional Significance of BMD in Patients with Osteogenesis Imperfecta. 72nd Annual Meeting of the American Academy of Orthopaedic Surgeons, Washington DC, 2005.
 41. Guzel, VB, Aurang, K, **Ambrose, CG**, Clyburn, TA: Biomechanical Comparison of 1-Pole vs 3-Pole Polyethylene Patellar Implant on Fracture Resistance. 74th Annual Meeting of the American Academy of Orthopaedic Surgeons, San Diego, CA, February 2007.
 42. **Ambrose, CG**, Mika, J, and Terry Clyburn, T: Evaluation of Trabecular Metal Implants and Antibiotic Impregnated Microspheres in Osteomyelitis. 24th Annual Meeting of the Houston Society for Engineering in Medicine and Biology, Houston, February 8-9, 2007.
 43. **Ambrose, CG**, Mika, J, Gogola, GR, Culton, LK, Johnson, E, Peralta, IRG, Wilson, LJ: In vivo testing of a bone-selective fullerene: Preliminary Safety and Efficacy Assessment. 24th Annual Meeting of the Houston Society for Engineering in Medicine and Biology, Houston, February 8-9, 2007.
 44. **Ambrose, CG**, Kaplan, HB, Winslow, S, Jacob, V, and Wang, Y: Development of an in vitro model for biofilms on orthopaedic implants. 24th Annual Meeting of the Houston Society for Engineering in Medicine and Biology, Houston, February 8-9, 2007.
 45. Winslow S, Jacob V, Wang Y, **Ambrose C**, Kaplan H. Development of an In-Vitro Model for Staphylococcus Aureus Biofilms on Orthopaedic Devices. Paper presented at: 4th ASM Conference on Biofilms; Quebec, Canada, March 2007.
 46. Richardson M, Chandwani V, Ono K, Johnson E, Kogiso M, Wakame K, **Ambrose CG**, Martinex-Puig D, Kulkarni A. Dietary Nucleotides and Skeletal Function in a Mouse Model of Accelerated Aging. Paper presented

- at: European Society for Clinical Nutrition and Metabolism, Prague, Czech republic, 2007.
47. Funk S, **Ambrose C**, Kaplan H. Development of In-Vitro Biofilm Model for Diabetic Foot Ulcer Infections. Paper presented at: Texas Branch Fall Meeting of the American Society for Microbiology; Sam Houston State University, Texas, November 2007.
 48. Jordan M, Ardestani S, Troetscher T, Wanger A, Guo D, Kaplan H, **Ambrose C**. Development of a Rapid and Sensitive Molecular Diagnostic Test to Identify the Causative Bacteria in Diabetic Foot Ulcer Infections. Paper presented at: Texas Branch Fall Meeting of The American Society for Microbiology; Sam Houston State University, Texas, November 2007.
 49. Kulkarni A, Richardson M, Ono K, Chandwani V, Johnson E, Kogiso M, Wakame K, **Ambrose C**, Martinez-Puig D. Nutritional Nucleotides Improve Bone Integrity in Skeletal Disuse. Paper presented at: American Society for Parenteral and Enteral Nutrition 2008 Annual Conference, Chicago, 2008.
 50. Peralta, I, **Ambrose, C**, and Wilson, L. In Vivo Testing of a Bone-Selective Fullerene: Preliminary Safety and Efficacy Testing. Presented at the 213th Meeting of the Electrochemical Society, Phoenix, Arizona, May 2008.
 51. **Ambrose C**, Ardestani S, Troetscher T, Wanger A, Guo D, Clyburn T, Kaplan H. Identification of Causative Bacteria in Osteomyelitis Using Rapid and Sensitive 16 S rDNA Detection. Paper presented at: The 55th Annual Meeting of the Orthopaedic Research Society; Las Vegas, Nevada, February 2009
 52. Johnson, E, Shau, D, Cody, D, **Ambrose, CG**. Bone Mineral Density Assessment Using Different Techniques. 26th Annual Meeting of the Houston Society for Engineering in Medicine and Biology, Houston, February 19-20, 2009.
 53. Wagenheim, GN, Alam, S, **Ambrose, CG**, Sen, M, Dickson, KF. Mortality in Patients with Unilateral and Bilateral Femur Fractures, Presented at 2010 American Academy of Orthopaedic Surgeons Meeting, March 2010, New Orleans.
 54. Mika J, Clanton TO, Kinne RW, **Ambrose CG**. Surgical Preparation for Articular Cartilage Regeneration in Patients with Osteoarthritis. Presented at the International Cartilage Repair Society, September 26-29, 2010, Barcelona.
 55. Broyles J, Wagenheim G, Alam S, **Ambrose C**, and Sen M. A High Ratio of Fresh Frozen Plasma to Packed Red Blood Cells Significantly Decreases Mortality in Femur Fracture Patients Requiring Massive Transfusion. Presented at Orthopaedic Trauma Association Annual Meeting, October 13-16, 2010, Baltimore.
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1. **Ambrose, CG**, Hayes, LJ, Dulikravich, GS: An Active Control System for Thermal Fields in Hypothermia Processes. *American Institute of Chemical Engineers* 85(269):400-405, 1989.
2. Ward, LD, **Ambrose, CG**, Masson, MV, Levaro, F: The Role of the Distal Radioulnar Ligaments, Interosseous Membrane and Joint Capsule in DRUJ Stability. *Journal of Hand Surgery*, 25A:341-351, 2000.
3. **Ambrose, CG**, Kiebzak, GM, Sabonghy, EP, Tabor, OB, Peindl, RD, Clanton, TO, Anderson, RA, Davis, WH. Biomechanical Testing of Cadaveric Specimens: Importance of Bone Mineral Density Assessment. *Foot and Ankle International*, 23(9):850-855, 2002.
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5. Bancroft, GN, Sikavitsas, VI, van den Dolder, J, Sheffield, TL, **Ambrose, CG**, Jansen, JA, and Mikos, AG. Fluid Flow Increases Mineralized Matrix Deposition in Three-Dimensional Perfusion Culture of Marrow Stromal Osteoblasts in a Dose-Dependent Manner, *Proceedings of the National Academy of Sciences USA*, 99(20):12600-5, 2002.
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11. Timmer M, **Ambrose C**, Mikos A.: Evaluation of Thermal- and Photo-Crosslinked Biodegradable Poly(Propylene Fumarate)-Based Networks. *Journal of Biomedical Materials Research*, 66A(4):811-8, 2003.
12. **Ambrose CG**, Gogola GR, Clyburn TA, Raymond AK, Peng AS, and Mikos AG. Antibiotic Microspheres: Preliminary Testing for Potential Treatment of Osteomyelitis, *Clinical Orthopaedics and Related Research*, 415:279-285, 2003.

13. Sabonghy, P., Wood, RM, **Ambrose, C.**, McGarvey, WC, Clanton, TO. Tendon Transfer Fixation: Comparing a tendon to tendon technique vs. bioabsorbable interference-fit screw fixation. *Foot and Ankle International*, 24(3):260-262, 2003.
14. Clyburn, T.A., Weitz-Marshall, A., and **Ambrose, C.G.**: "Constrained Acetabular Cups: A Cadaveric Biomechanical Evaluation". *Journal of Arthroplasty*, 18(4):466-70, Jun 2003.
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18. Ambrose, RO and **Ambrose, C.** Primate Anatomy, Kinematics and Principles for Humanoid Design. *International Journal of Humanoid Robotics*, 1:175-198, 2004.
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20. **Ambrose, CG**, Clyburn, TA, Louden, K, Joseph, J, Wright, J, Gulati, P, Gogola, GR, Mikos, GA. Effective treatment of osteomyelitis with biodegradable microspheres in a rabbit model. *Clinical Orthopaedics and Related Research*, 421:293-299, 2004.
21. Temenoff, JS, Park, H, Jabbari, E, Conway, DE, Sheffield, TL, **Ambrose, CG**, and Mikos, AG: Thermally Cross-Linked Oligo(poly(ethylene glycol)fumerate) Hydrogels Support Osteogenic Differentiation of Encapsulated Marrow Stromal Cells in Vitro. *Biomacromolecules*, 5:5-10, 2004.
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23. Warnock, KM, Johnson, BD, Wright, JB, **Ambrose, CG**, Clanton, TO, and McGarvey, WC: Calculation of the Opening Wedge for a Low Tibial Osteotomy. *Foot and Ankle International*, 25(11):778-782, 2004.
24. Holtorf, HL, Sheffield, TL, **Ambrose, CG**, Jansen, JA, and Mikos, AG: Flow Perfusion Culture of Marrow Stromal Cells Seeded on Porous Biphasic Calcium Phosphate Ceramics. *Annals of Biomedical Engineering* 33(9):1238-48, Sept. 2005.
25. Kiebzak, GM, and **Ambrose, CG**: Relationship Among MRTA, DXA, and QUS Revisited, *Journal of Clinical Densitometry*, 8(4):396-403, 2005.

26. Kendler DL, Kiebzak GM, **Ambrose CG**, et al. Effect of calcium tablets on interpretation of lumbar spine DXA scans. *J Clin Densitom.*9(1):97-104, 2006.
27. Huang RP, **Ambrose CG**, Sullivan E, Haynes RJ. Functional significance of bone density measurements in children with osteogenesis imperfecta. *J Bone Joint Surg Am.* 88(6):1324-1330, 2006.
28. Elkousy, H, Hammerman, SM, Edwards, TB, Warnock, KM, O'Connor, DP, **Ambrose, C**, Meyers, D, Gartsman, GM. The arthroscopic square knot: A biomechanical comparison with open and arthroscopic knots. *Arthroscopy* 22(7):736-741, 2006.
29. Clyburn T, Weitz-Marshall A, **Ambrose C**, Ursua V. Outcomes of patellofemoral replacement in total knee arthroplasty using meticulous techniques. *Orthopedics* 30(2):111-115, 2007
30. Budoff JE, Meyers DM, and **Ambrose CG**. The Comparative Stability of Screw Versus Plate Versus Screw and Plate Coronoid Fixation. *J Hand Surg*, 36(2):238-245, 2011.
31. Mika J, Clanton TO, Pretzel D, Schneider G, **Ambrose CG**, Kinne RW. Surgical Preparation for Articular Cartilage Regeneration without Penetration of the Subchondral Bone Plate: In Vitro and In Vivo Studies in Human & Sheep. *Am J Sports Med*, 39(3):624-631, 2011.

Book Chapters:

1. **Ambrose, CG**, Sharif, A, Diller, KR, and Hayes, LJ. A Numerical Design Methodology for a VLSI Cryostage, in Computational Methods in Bioengineering, Spilker, RL and Simon, BR, editors, 1988.
2. Katz, JL, **Ambrose, CG**, McMillin, CR, and Spencer, P. Orthopaedic Biomaterials, in Encyclopedia of Biomaterials and Biomedical Engineering, Wnek, GE and Bowlin, GL, editors, 2004.

Invited Presentations:

1. Walker, I. And **Ambrose C.G.**: "Engineering Issues in Hand, Hip and Knee Prosthetics: Grasping and Walking", Houston Sigma Xi Society, Rice University, October 1994.
2. **Ambrose, C.G.**, Biegler, F.B., and Harrigan T.P.: "Modeling and Simulation of Human Bone Structures", Life Sciences Division of Johnson Space Center, May 1994.
3. **Ambrose, C.G.**, Biegler, F.B., and Harrigan, T.P.: "University of Texas Orthopaedic Biomechanics Lab: Current Research Projects", UTMB Galveston, September, 1996.
4. **Ambrose, C.G.**: "Introduction to Skeletal Biomechanics", TMC Rigid Fixation Course, UTHSC-Houston, October 1998.
5. **Ambrose C.G.**: "PLGA/PEG Microspheres as an Antibiotic Delivery System for Osteomyelitis", Rice University, November 1998.
6. **Ambrose C.G.**: "Plastics", Ed T. Smith Orthopaedic Lectureship, November 1999.

7. **Ambrose, C.G.**, Adve, S., Hightower, A., Saterbak, A. and Shanks, J.: “Women in Technology”, Rice Women’s Conference, February 1999.
8. **Ambrose C.G.:** “Orthopaedic Biomaterials”, talk given to the Orthodontics Department at the University of Texas Health Science Center - Dental Branch, September 24, 2003.
9. **Ambrose C.G.:** “Designing a Clinical Study”, talk given to the Department of Orthopaedic Surgery at the University of Texas Health Science Center – Medical School, July 31, 2003.
10. **Ambrose C.G.:** “In Vivo Testing of Orthopaedic Scaffolds”, given at the Joint UK/Texas Symposium on Tissue Engineering and Regenerative Medicine, Imperial College London, March 29-30, 2004.
11. **Ambrose C.G.:** “The Effect of NSAIDs on Fracture Healing and Bone Remodeling”, Grand Rounds talk given to the Department of Orthopaedic Surgery at Baylor College of Medicine, September 22, 2004.
12. **Ambrose CG:** “Animal Models in Orthopaedics”, Joint UK/Texas Symposium on Tissue Engineering, Houston, TX, March, 2005.

Letters to the Editor:

1. Kiebzak, GM, Beinart, GA, Perser, K, **Ambrose, CG**, Siff, SJ, Heggeness, MH : “Undertreatment of Osteoporosis in Men who have had a Hip Fracture – Reply”. *Archives of Internal Medicine* 163(190):1236-1237, 2003.
2. Kiebzak, GM, Beinart, GA, Perser, K, **Ambrose, CG**, Siff, SJ, Heggeness, MH : “Hypogonadism and Osteoporosis in Men – Reply”. *Archives of Internal Medicine* 163(190):1237-1238, 2003.
3. **Ambrose, C.** and Gogola G: The Effect of NSAIDs on Fracture Healing, *Journal of Bone and Joint Surgery* published electronically March 2005, www.jbjs.org.
4. Sheth DS and **Ambrose CG:** Stress Test for Predicting the Need for Surgical Fixation of Fibular Fractures, *Journal of Bone and Joint Surgery* 87(5A):1165, 2005.

OTHER PROFESSIONAL ACTIVITY:

Ad Hoc Reviewer for the following journals:

- *Acta Biomaterialia*
- *Annals of Biomedical Engineering*
- *Experimental Mechanics*
- *Foot and Ankle International*
- *Journal of Antimicrobial Chemotherapy*
- *Journal of the American Medical Association*
- *Journal of Biomedical Materials Research: Part A*
- *Journal of Orthopedic Research*
- *Osteoporosis International*
- *IEEE Transactions on Mechatronics*

Grant reviewer for the following programs:

- Ad Hoc Reviewer for *Skeletal Biology, Development and Disease Study Section* for the National Institutes of Health, 2008-present

- Reviewer for *Special Emphasis Panel* for the National Institutes of Health, 2009
- The National Academies, National Research Council, Committee to Review Proposals to the 2011 Ohio Third Frontier (OTF) Wright Projects Program (WPP), 2011.
- *American Osteopathic Association Council on Research*
- *Multidisciplinary Research Grants Program* for the North Carolina Biotechnology Center
- South Carolina *Experimental Program to Stimulate Competitive Research (EPSCoR)* and *Institutional Development Awards (IDeA)* programs

US Patent Pending, *Biodegradable Microspheres for Antibiotic Drug Delivery*

Patent granted: Australia, New Zealand, South Africa

US Patent Pending, *Adjustable Volume Liquid Dispensing Pump*