

Tae-Hong Lim, Ph.D.

OFFICE

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PERSONAL

Date of Birth: March 27, 1959
Nationality: Republic of Korea
Visa Status: Permanent Residence (A73898765)

EDUCATION

Ph.D.	Mechanical Engineering, University of Iowa, Iowa City, Iowa	August, 1990
M.S.	Mechanical Design and Production Engineering, Seoul National University, Seoul, Korea	February, 1984
B.S.	Mechanical Design and Production Engineering, Seoul National University, Seoul, Korea	February, 1982

PROFESSIONAL EXPERIENCE

January, 2003 – Present	Professor Department of Biomedical Engineering University of Iowa Iowa City, IA
July, 1997 – December, 2002	Associate Professor Department of Orthopaedic Surgery, Rush University, Rush-Presbyterian-St. Luke's Medical Center, Chicago, IL Adjunct Associate Professor Department of Bioengineering, University of Illinois at Chicago, Chicago, IL
July, 1996 – June, 1997	Associate Professor & Director of Biomechanics Laboratory Department of Orthopaedic Surgery, Medical College of Wisconsin, Milwaukee, Wisconsin
September 1992 – June, 1996	Assistant Professor & Director of Biomechanics Laboratory Department of Orthopaedic Surgery, Medical College of Wisconsin, Milwaukee, Wisconsin
April 1993 – June, 1997	Adjunct Assistant Professor Biomedical Engineering Department, Marquette University, Milwaukee, Wisconsin
September 1991 - September 1992	Research Associate Orthopaedic and Spine Center, Hinsdale Hospital, Hinsdale, Illinois
September 1990 - September 1991	Research Associate (Postdoctoral Training) Rehab R & D Center, VA Hines Hospital, Hines, Illinois
August, 1986 – August 1990	Research and Teaching Assistant Department of Biomedical Engineering, The University of Iowa, Iowa City, Iowa
January, 1984 – June, 1986	Research Engineer Central Research Laboratory, Goldstar Company, Seoul, Korea

RESEARCH INTERESTS

1. **Mechanobiology**
2. **Discogenic low back pain: biomechanical and neurobiological approach**
3. **Orthopaedic Biomechanics:**
 - **roles of back muscles in controlling the stability of the spine**
 - **roles of muscles in controlling the joint mechanics (current interest is in knee joint)**
 - **biomechanical evaluation of various orthopaedic implants**
4. **Rehabilitation: Pain control and Muscle strengthening Exercise**
5. **Development of Drug Delivery System**

Current Research Projects:

1. **Development of in vivo animal model for discogenic low back pain**
2. **Effect of shear load on the disc degeneration and low back pain (in vitro culture study)**
3. **Role of back muscles in maintaining the stability of the lumbar spine with no loss of flexibility**
4. **Development of temperature responsive in-situ gelling hydrogels for delivering drugs, growth factors and/or cell into the local sites in the body**
5. **Biomechanical investigation of various surgical methods**
6. **Effect of immobilization on the IVD: in vivo rat studies (research grant funded by NIH in collaboration with Palmer College of Chiropractic)**

PATENTS

1. Gu JK, An HS, **Lim TH**: "Spinal Fixation System" US Patent 6,280,443; August 28, 2001.
2. **Lim TH**, Park JB, Lee JW: "Spinal Drug Delivery System for Treatment of Low Back Pain" approved by UIRF (#03060) and filed for review of US patent.
3. Park JB, **Lim TH**, et al: "Breast Implant Filling Material," approved by UIRF (#04082) and filed for review of US patent.
4. Park JB, **Lim TH**, et al.: "Periurethral filling prosthesis for treating urinary incontinence" under review of UIRF (#04082).

HONORS AND AWARDS

Awards:

1. **Performance Award**, awarded by Department of Veterans Affairs; Awarded for a significant contribution to the mission of the Department by substantially exceeding performance requirements, June 3, 1991.
2. **First Place in the Basic Science Category - Senior Division of the 1996 PSEF Scholarship Essay Contest in the Annual Meeting of American Association of Plastic Surgeons, 1996**: Gosain AK, Capel CC, Song L, Carro MA, Tobola MK, **Lim TH**, and McCarthy JG: "Biomechanical and Histologic Alteration of Facial Recipient Bone following Reconstruction with Autogenous Bone Graft and Alloplastic Implants: A One Year Study."
3. **Best Basic Science Paper in the Annual Meeting of Korean Spine Society, 1998**: You JW and **Lim TH**: "Biomechanical Evaluation of Supplemental Hook or Screw Fixation in Short Segment Spinal Instrumentation."

4. **Outstanding Poster Award in the 32nd Annual Meeting of the International Society for the Studies of the Lumbar Spine, 2005:** Lim TH, Kim JH, SJ Yang, Park JB: An abnormal shear force application on the lumbar vertebra caused disc degeneration and pain behavior in rat.

Session Chair:

1. Session IX-B Spine Mechanics-II, 1993 ASME/AICHE/ASCE Summer Bioengineering Conference, Breckenridge, Colorado, 1993;
2. Session Bio-13A Spine Mechanics-I, ASME International Mechanical Engineering Congress and Exposition, Chicago, November, 1994;
3. Session Bio-13A Spine Mechanics-I, ASME Winter Annual Meeting, San Francisco, November, 1995);
4. Orthopaedic Biomechanics Session, IEEE EMBS Annual Conference, Chicago, 1997
5. Spine Biomechanics Sessions I & II, ASME Summer Bioengineering, Snow Bird, Utah, 2001.

Scientific Session Organizer,

1. Spine Mechanics Sessions in 1997 Summer Bioengineering Conference, Sun River, Oregon, June 11-15;
2. Microsymposia on Back and Neck Pain & Injuries in 1997 ASME Winter Annual Meeting, Dallas, Texas.
3. Spine Mechanics Sessions in 2000 ASME Winter Annual Meeting (IMECE 2000);
4. Spine Mechanics Sessions in 2001 ASME Summer Bioengineering Conference.

MEMBERSHIPS

1. **The American Society of Mechanical Engineering (ASME):** Membership #: 3878360
(Solid Mechanics Scientific Committee and Chairman of the Membership Development Committee, Bioengineering Division, ASME)
2. **Orthopaedic Research Society (ORS):** Membership #: 074633 0175120
3. **International Society for the Studies of the Lumbar Spines (ISSLS):** since June, 1995.
4. **Americal Institute of for Medical and Biological Engineering (AIMBE):** Fellow since February 2007

EDITORSHIP

Reviewer of scientific journal articles submitted for publication in the following Journals:

Spine (Advisory editor)
The Spine Journal (Associate Editor)
Journal of Biomechanical Engineering (Reviewer)
Journal of Orthopaedic Research (Reviewer)
Journal of Biomechanics (Reviewer)

Conference Abstract Review: abstracts submitted for presentation in '94, '95, '01 ASME Winter Annual Meetings, '97 Summer Bioengineering Conference, and '07 Orthopaedic Research Society

TEACHING EXPERIENCES

POST-DOCTORAL TRAINING

1. Ruth Ochia: September, 2002 – July, 2003, Department of Orthopedic Surgery, Rush-Presbyterian-St. Luke's Medical Center, Chicago, Illinois.
2. Seok-Jo Yang: September, 2003 – February, 2004, Department of Biomedical Engineering, University of Iowa, Iowa City, Iowa.

GRADUATE STUDENT ADVISORSHIP (* Major advisor)

PH.D. STUDENTS

- 1.* **Hong JH:** "Poroelastic Properties of Vertebral Trabecular Bone." (Completed in May, 1996), Department of Biomedical Engineering, Marquette University, Milwaukee, Wisconsin.

2. Abuzzahab Jr. FS: "A Kinetic, Biomechanical Model of the Foot and Ankle and Kinematic Study of Hallux Valgus." (completed in May, 1995), Department of Biomedical Engineering, Marquette University, Milwaukee, Wisconsin.
3. Jizzine HA: "Analysis of Head, Trunk and Upper Extremity Kinematics in Seated Normal Children and Children with Cerebral Palsy," Department of Biomedical Engineering, Marquette University, Milwaukee, Wisconsin.
4. Rebecca Bachschmidt: "Kinetic and Kinematic Analysis of the Upper and Lower Extremity Joints in Walker Assisted Gait," Department of Biomedical Engineering, Marquette University, Milwaukee, Wisconsin.
5. *Jesse Kim: (Partial completion because of my relocation), Department of Bioengineering, University of Illinois at Chicago, Chicago, Illinois.
6. *Susan M. Renner: (partial completion because of my relocation), Department of Bioengineering, University of Illinois at Chicago, Chicago, Illinois.
7. Hyunggun Kim: (completed in December 2005) Department of Biomedical Engineering, University of Iowa, Iowa City, Iowa.
8. *Prem Ramakarishnan: (Completed in August 2006) Department of Biomedical Engineering, University of Iowa, Iowa City, Iowa.
9. *Jin Whan Lee: (Completed in August 2006) Department of Biomedical Engineering, University of Iowa, Iowa City, Iowa.
10. *Jae-Hyun Kim: (Completed in August 2006) Department of Biomedical Engineering, University of Iowa, Iowa City, Iowa.
11. *Adytia Ingalhalikar: (Partial completion due to student's industrial job) Department of Biomedical Engineering, University of Iowa, Iowa City, Iowa.
12. Mathew McCullough: (completed in Summer 2006) Department of Biomedical Engineering, University of Iowa, Iowa City, Iowa.
13. Kirin Shivanaan: (completed in Summer 2006) Department of Biomedical Engineering, University of Iowa, Iowa City, Iowa.
14. Hana Lundburg: (completed in Fall 2006) Department of Biomedical Engineering, University of Iowa, Iowa City, Iowa.
15. Ting Xia: (completed in Fall 2006) Department of Biomedical Engineering, University of Iowa, Iowa City, Iowa.
16. *Kap Soo Han: (started in Spring 2004, on-going) Department of Biomedical Engineering, University of Iowa, Iowa City, Iowa.
17. Jessica Goetz: (QE passed in Spring 2006) Department of Biomedical Engineering, University of Iowa, Iowa City, Iowa.
18. *Candis Dubose: (started in Fall 2006 and on-going) Department of Biomedical Engineering, University of Iowa.
19. *Don Rim Seol: (started in Fall 2006 and on-going) Department of Biomedical Engineering, University of Iowa.

M.S. STUDENTS

1. *Eck JC: "Non-invasive 3-D In Vivo Motion Analysis of the Cervical Spine." (accomplished in Aug., 1996), Department of Biomedical Engineering, Marquette University, Milwaukee, Wisconsin
2. Demarais D: "Kinematic Analysis of the Tibio-Talar and Subtalar Joints during Gait." (accomplished in Aug., 1995), Department of Biomedical Engineering, Marquette University, Milwaukee, Wisconsin
3. *Jesse Kim: "Biomechanical Evaluation of Diagonal Transifixation" (accomplished in 2000) Department of Bioengineering, University of Illinois at Chicago, Chicago, Illinois.
4. *Susan M. Renner: "Biomechanical Evaluation of a New Bone Mineral Cement for Vertebroplasty and Pedicle Screw Augmentation" (accomplished in 2001) Department of Bioengineering, University of Illinois at Chicago, Chicago, Illinois.
5. *Prem S. Ramakarishnan: (Accomplished in August, 2002), Department of Bioengineering, University of Illinois at Chicago, Chicago, Illinois.

6. Suhasini Gururaja: “Deformation induced fluid flow in the lacunar-canalicular system of human cortical bone” (Accomplished in August, 2003), Department of Civil and Environmental Engineering, University of Iowa, Iowa City, Iowa.
7. Suzanne M. Bouchard: “A Finite Element Study of Constrained Acetabular Cups” (Accomplished in May, 2004), Department of Biomedical Engineering, the University of Iowa, Iowa City, Iowa.
8. ***Navid Sheema**: (Accomplished in August, 2003), Department of Bioengineering, University of Illinois at Chicago, Chicago, Illinois.
9. ***Adytia Ingalkalikar**: (Completed in August 2005) “Effect of total disc arthroplasty on segmental motion and intradiscal pressure at adjacent level: AN in vitro biomechanical model” Accomplished in August 2005, Department of Biomedical Engineering, University of Iowa, Iowa City, Iowa.
10. ***Brandan Korpanty**: (Completed in May 2006) Department of Biomedical Engineering, University of Iowa, Iowa City, Iowa.
11. ***Hyunchul Kim**: (Completed in December 2006) Department of Biomedical Engineering, University of Iowa, Iowa City, Iowa.

PhD Committee Membership in University of Iowa (Spring 2003 – Present)

	Role in Committee	Student	Status	Current position
1	Chair	Jaehyun Kim	Defense in Summer 2006 Completed in Dec 2006	Post-doc in University of Pennsylvania
2	Chair	Prem Ramakrishnan	Completed in Summer 2006	Post-doc in University of Iowa (Dept Orthop)
3	Co-chair	Jin Whan Lee	Completed in Summer 2006	Research Scientist in, BISCO, Co., Schaumburg, Illinois
4	Committee	Hyunggun Kim	Completed in Dec 2005	
5	Committee	Kirin Shivannan	Completed in Summer 2006	
6	Committee	Mathew McCullough	Completed in summer 2006	
7	Committee	Hana Lundburg	Comp exam in Spring 2006, will complete in Dec 2006	
8	Committee	Ting Xia	Comp. exam in summer 2006, wil complete in Dec 2006	
9	Committee	Jessica Goetz	Qualifying exam in Spring 2006	
10	Chair	Kap Soo Han	Qualifying exam in Fall 2005	
11	Chair	Candis DuBose	Started in Fall 2006	
12	Chair	Dong Rim	Started in Fall 2006	

COURSE WORKS

1. **Dynamics** (undergraduate course), Department of Biomedical Engineering, University of Iowa, **Teaching Assistant**, 1989; Department of Mechanical and Industrial Engineering, Marquette University, Milwaukee, WI., **Instructor**, September 1993 - December 1993
2. **Biomedical Engineering Labs**, Department of Biomedical Engineering, University of Iowa, **Teaching Assistant**, 1989.
3. **Biomechanics** (Orthopaedic Residents), Department of Orthopaedic Surgery, Medical College of Wisconsin, 1993-1996; (graduate course), Department of Mechanical, Materials and Aerospace Engineering, Illinois Institute of Technology, Chicago, Illinois, **Instructor**, August - December of 1999..
4. **Kinematic Principles in Human Motion Analysis** (graduate course), Biomedical Engineering Department, Marquette University, Milwaukee, Wisconsin, **Instructor**. Spring, 1995.
5. **Mechanics of Solids** (undergraduate course), Department of Mechanical, Materials and Aerospace Engineering, Illinois Institute of Technology, Chicago, Illinois, **Instructor**, January –April of 1999.

6. **Mechanics of the Human Spine** (graduate course), Department of Biomedical Engineering, University of Illinois at Chicago, Chicago, Illinois, Instructor (from 1999 to 2002).
7. **Biomechanical Design** (undergraduate course), Department of Biomedical Engineering, University of Iowa, Iowa City, Iowa (Spring semester, 2003, 2004).
8. **Mechanics of Deformable Bodies** (undergraduate course), Department of Biomedical Engineering, University of Iowa, Iowa City, Iowa (Fall semester, 2003, Summer 2004, Fall 2004, Fall 2007).
9. **Spine Mechanics** (graduate course), Department of Biomedical Engineering, University of Iowa, Iowa City, Iowa (Spring 2004).
10. **Musculoskeletal Tissue Mechanics** (graduate course), Department of Biomedical Engineering, University of Iowa, Iowa City, Iowa (Fall 2004, Fall 2007).
11. **Statics** (undergraduate course), College of Engineering, University of Iowa (Spring and Fall 2005)
12. **Musculoskeletal Biomechanics** (graduate course), Department of Biomedical Engineering, University of Iowa, Iowa City, Iowa (Spring 2006, Spring 2007).
13. **Biomechanics** (undergraduate course), Department of Biomedical Engineering, University of Iowa, Iowa City, Iowa (Spring 2007).

GUEST LECTURER

1. **Department of Orthopaedic Surgery, University of North Carolina**, Chapel Hill, NC, 1991.
2. **Department of Orthopaedic Surgery, Texas Tech University**, El Paso, TX, 1991.
3. **Department of Surgery, University of Maryland**, Baltimore, MD, 1991.
4. **Samsung Jeil General Hospital**, Seoul, Korea, 1995
5. **Department of Mechanical Engineering, Columbia University**, New York, NY, 1995
6. **Department of Orthopaedic Surgery, Kyunghee University Hospital**, Seoul, Korea, 1996
7. **Department of Orthopaedic Surgery, Children's Hospital**, San Diego, 1996
8. **Department of Orthopaedic Surgery, Yeungnam University Hospital**, Tae-gu, Korea, 1996, 1999, 2000
9. **Department of Orthopaedic Surgery, Ewha Womens' University Hospital**, Seoul, Korea, 1996, 1999.
10. **Department of Orthopaedic Surgery, Chosun University Hospital**, Kwangjoo, Korea, 1997, 1999.
11. **Department of Orthopaedic Surgery, Chungnam University Hospital**, Tae-Jun, Korea, 1997
12. **Department of Orthopaedic Surgery, Samsung Hospital**, Seoul, Korea, 1997, 1999
13. **Department of Orthopaedic Surgery, Ajou University Hospital**, Suwon, Korea, 1999
14. **Department of Orthopaedic Surgery, Catholic University Hospital**, Seoul, Korea, 1997, 1998
15. **Department of Orthopaedic Surgery, Sevrance Yonsei University Hospital**, Seoul, Korea, 2000
16. **Department of Orthopaedic Surgery, Soonchunhyang University Hospital**, Chonan, Korea, 1996
17. **Department of Biomedical Engineering, The University of Iowa**, 1999
18. **Biomedical Engineering Society**, Seoul, Korea, 2000
19. **U&I Incorp**, Seoul, Korea, 2000
20. **Department of Mechanical and Industrial Engineering, Kyunghee University**, Suwon, Korea, 2001
21. **Department of Orthopedic Surgery and Medical College, Eulji University**, Daejeon, Korea, 2001.
22. **Department of Bioengineering, University of Toledo**, Toledo, Ohio, 2002
23. **School of Biotechnology, Sungkyunkwan University**, Suwon, Korea, 2002
24. **Samsung Advanced Institute of Technology**, Kiheung, Korea, 2002
25. **Department of Civil Engineering, University of Iowa**, Iowa City, IA, 2003
26. **Department of Mechanical and Industrial Engineering, Kyunghee University**, Suwon, Korea, 2004
27. **Department of Mechanical Engineering, Hanyang University**, Ansan, Korea, 2004.
28. **Eulji Spine Symposium, Eulji University**, Daejeon, Korea, 2004.
29. **The Iowa Spine Symposium**, Department of Orthopaedic Surgery, The University of Iowa, Iowa City, Iowa, 2004.
30. **Korea Research Institute of Chemical Technology**, Daedeok, Korea, January, 2005.
31. **Department of Biomedical Engineering, Yonsei University**, Wonjoo, Korea, January, 2005.
32. **Department of Mechanical Engineering, Kangwon National University**, Chuncheon, Korea, January, 2005.
33. **Department of Control and Measurement Engineering, Korea University**, Chochiwon, Korea, January, 2005.

34. **Korean Society for Biomechanical Engineers**, Seoul, Korea, January, 2005.
35. **Department of Orthopaedic Surgery, Seoul National University**, Seoul, Korea, July 2005.
36. **Korea University Hospital, Korea University**, Seoul, Korea, July 2005.
37. **School of Biotechnology, Sungkyunkwan University**, Suwon, Korea, July 2005.
38. **Spine Research Center, Yeungnam University**, Daegu, Korea, July 2005.
39. **Department of Biomedical Engineering, Yonsei University**, Wonjoo, Korea, July, 2005.
40. **Department of Orthopaedic Surgery, Chosun University**, Kwang-joo, Korea, July, 2005.
41. **Department of Mechatronics Engineering, Chungnam University**, Daejeon, Korea, August, 2006.
42. **Department of Rehabilitation, Chungnam University Hospital**, Daejeon, Korea, August, 2006.
43. **Spine Center, Kyunghee University Hospital**, Seoul, Korea, August, 2006.
44. **Department of Biomedical Engineering, Yoinsei University**, Wonjoo, Korea, December, 2006
45. **Korean Spine Research Society**, invited as a guest lecturer, **Daegu, Korea, May, 2007.**

RESEARCH EXPERIENCES

EXTRAMURAL GRANT PROPOSALS († indicates PI or Co-PI.)

1. Tae-Hong Lim†, Avinash G. Patwardhan†, Michael R. Zindrick†, Arthur C. Vailas, and Gary W. Knight: "Optimum Implant Stiffness for Lumbar Fusion - A Pilot Study," Funded by the VA Rehabilitation Research and Development Service October 1, 1992 - September 30, 1993 (Direct Cost of \$45,000).
2. Howard S. An, Jeffrey Toth, Kenneth Lynch, Tae-Hong Lim: "Effect of Porosity of Biphasic Hydroxyapatite/tricalcium Phosphate Ceramic on the Incorporation and Biomechanical Strength in the Anterior Cervical Fusion in Goat Model," Funded by Danek Medical Inc., July 1993 - July 1994 (Total cost of \$60,000).
3. Howard S. An and Tae-Hong Lim†: "Effect of Transverse Linking Devices on the Rigidity of the Spinal Constructs," Funded by American Medical Electronics, Inc. August 1993 - August 1994 (Total cost of \$20,400).
4. Howard S. An, Tae-Hong Lim†, Victor Houghton, and Bruce Nowicki: "Relationship between Disc Degeneration and Spinal Instability: A MRI, Kinematic, and Biomechanical Study with Cryomicrotomic Anatomic Correlations," Funded by North American Spine Society, July, 1993 (Total cost of \$35,000).
5. Howard S. An and Tae-Hong Lim†: "Effect of Stabilization with a New Plate on the Rigidity of the Anterior Spinal Constructs," Funded by AcroMed Corp. in August, 1993 (Total cost of \$30,000).
6. Victor M. Haughton, Bruce Nowicki, Tae-Hong Lim, and Gerald F. Harris: "A CT, MR and Cryomicrotomic Study of Spine Anatomy," Funded by NIH AR33667-06 (Direct cost of \$53,376).
7. Howard S. An, †Gerald F. Harris, Tae-Hong Lim†, and Victor M. Haughton: "Non-invasive 3-D In Vivo Motion Analysis of the Cervical Spine," Funded by the VA Rehabilitation Research and Development Service, June, 1994 (Direct cost of \$36,700).
8. Howard S. An and Tae-Hong Lim†: "Anatomic and Biomechanical Study of EBI® Facet Screw and Interfacet Spacer System," Funded by EBI, Inc., August, 1994 (Total cost of \$31,800).
9. Gerald F. Harris, Tae-Hong Lim†, and Howard S. An: "Computational Modeling of Head-Neck Motion - Experimental Studies," Funded by the Naval Biodynamics Laboratory through Tulane University, May, 1995, (Direct cost of \$33,468).
10. Lee H. Riley, III, Howard S. An, Jeffrey Toth, and Tae-Hong Lim: "Laparoscopic Lumbosacral Anterior Discectomy and Fusion in a Human Cadaver and Live Canine Model," Funded by De Puy, Inc., 1994 (Total cost of \$50,000).
11. Jeffrey Toth, Howard S. An, Tae-Hong Lim, Kenneth L. Lynch, Lee H. Riley, and Nicholas G. Weiss: "Enhancement of Cervical Fusion with a Reinforced Porous Biphasic Hydroxyapatite/b - Tricalcium Phosphate Ceramic Loaded with Bone Morphogenetic Proteins: Histological and Biomechanical Assessment of Fusion in the Anterior Cervical Caprine Model," Funded by Danek Medical Inc., May 1995 (Total cost of \$80,000).
12. Howard S. An, Tae-Hong Lim†, and Linda McGrady: "The Ideal Amount of Foraminal Distractions for the SpineTech™ Anterior Threaded Cage," Funded by SpineTech™, August, 1995 (Total cost of \$20,800).
13. Howard S. An, and Tae-Hong Lim†: "Effect of Anterior Grafting Devices on the Rotational Stability of the Anterior Spinal Constructs," Funded by DePuy Inc., July, 1996 (Total cost of \$15,340).

14. Howard S. An, Tae-Hong Lim†, Victor M. Haughton, and Bruce Nowicki: "Relationship between Disc Degeneration and Spinal Instability," Funded by the Orthopaedic Research and Education Foundation from July, 1996 to June 1998 (Approximate direct cost of \$40,000/year).
15. Howard S. An, and Tae-Hong Lim†: "The Effect of Bone Mineral Density and Endplate Thickness on Biomechanical Strength of the Graft-Endplate Interphase in the Cervical Spine," Funded by Cervical Spine Research Society, 1998 (Total cost of \$20,000).
16. Howard S. An, and Tae-Hong Lim†: "Effect of Distraction Procedures on the Biomechanical Characteristics of Surgical Constructs," (Total cost of \$50,000 funded by DePuy, Inc., 1998).
17. Howard S. An, and Tae-Hong Lim†: "Biomechanical Evaluation of New Cervical Anterior Plating System," (Total cost of \$25,000 funded by DePuy, Inc., 1998).
18. Tae-Hong Lim† and Howard S. An: "Biomechanical Evaluation of A New Crosslinking System in Transpedicular Fixation of the Thoracolumbar Spine," (Total cost of \$57,000 funded by Stryker Inc., 1998).
19. Howard S. An, Koichi Masuda, Eugene Thonar, and Tae-Hong Lim, Gunnar BJ Andersson, Klaus Keuttner: Effect of OP-1™ on Intervertebral Disc Regeneration: An in vitro and in vivo Investigation," (Total cost of \$100,000 funded by Stryker, Inc., 1998).
20. Avinash G. Patwardhan, Kevin P. Meade, and Tae-Hong Lim: "Effect of Spinal Implants on the Response of the Lumbar spine under In Vivo Compressive Loads," (Direct cost of \$400,00 for 3 years funded by VA Rehabilitation Research and Development Service, 1999).
21. Howard S. An, Tae-Hong Lim† and Thomas M. Turner, Robert Urban: "Effect of calcium phosphate cement (BoneSource) on the compressive strength of vertebroplasty and screw-bone interface," (Total cost of \$80,000 funded by Howmedica Osteonics Corp., 2000).
22. Tae-Hong Lim†, Howard S. An, and Gunnar Andersson: "In vivo analysis of segmental spine motion of the lumbar spine" (\$137,000/year (direct cost) funded by NIH, 2001 as a part of Program Project Grant, Intervertebral disc degeneration and regeneration: Biomechanical and biochemical approaches"). **Dr. Lim's salary portion (\$15,000) from Feb to July 2003 was transferred to the University of Iowa for his contribution.**
23. Gunnar Andersson, Raghu Natarajan, Tae-Hong Lim, Howard S. An: "Relationship between disc injury and repetitive loading" (\$125,000/yea (direct cost) funded by NIH, 2001 as a part of Program Project Grant, Intervertebral disc degeneration and regeneration: Biomechanical and biochemical approaches").
24. Charles N.R. Henderson, **Tae-Hong Lim (co-PI)**, Gregory D. Cramer: "Examining Manipulation with a Spine Fixation Model," (funded by NIH as a part of the grant for Developmental Centers for Research on Complementary and Alternative Med.: Center for the study of mechanisms and effects of chiropractic manipulation/adjustments. \$107,724/year for 3 years, June, 2003 – May, 2006).
25. Sergio Mendoza, ***Tae-Hong Lim (co-PI)**, Kathleen A. Sluka, Jeff Stevens: "Development of Discogenic Pain Model using Rats": (\$86,438 for one year funded by Medtronic-Sofamor-Danek. September, 2004 – August 2005).
26. **Tae-Hong Lim (PI)**: "Biomechanical Evaluation of novel dynamic fixation device (NFlex)," (\$40,000 for one year funded by NSpine, Inc., July 2004-June 2005).
27. **Tae-Hong Lim (PI)**: "Development of Short Course Program for Teaching Biomechatronics" (approved for funding by Korean Ministry of Education and Human Resource Development as an International Collaborator for Department of Control and Instrumentation Engineering at Korea University, Jochiwon, Korea, 9/01/04 – 8/31/2009, \$40,000 per year for 5 years) .
28. **Tae-Hong Lim (PI)**: "Biomechanical Evaluation of novel dynamic fixation device (NFlex)," (\$30,000 for one year funded by NSpine, Inc., September 2005-August 2006).
29. **Tae-Hong Lim (PI)**, James Martin: "An animal model for discogenic low back pain," (funded by NIH for two years, \$73,750/year, February 2006 – January 2008).
30. **Tae-Hong Lim (PI)**, James Martin: "Testing a Novel Composite Drug Delivery System for Long-Term Relief of Joint Pain," (proposal (\$50,000 for one year) submitted to 2006 Bioscience Fund in University of Iowa in November, 2006).
31. **Tae-Hong Lim (PI)**, James Martin: "In Vivo Evaluation of Novel Composite Drug Delivery System for Long-Term Relief of Joint Pain," (proposal (\$150,000 for one year) submitted to JL MediTech in February 2007)

DISSERTATIONS

1. **Lim TH**: "Kinematic Analysis on Robot Arms with Functional Movements," Seoul National University, Seoul, Korea, 1984 (Supervisor: Prof. Sun W. Cho).
2. **Lim TH**: "Design of a Spinal Fixation Device and Its Evaluation: An Analytical and Experimental Approach," The University of Iowa, Iowa City, Iowa, 1990 (Supervisor: Prof. Vijay K. Goel and Joon B. Park).

BOOK CHAPTERS

1. Goel VK, **Lim TH**, Gwon J, Chen JY, and Han J: "Biomechanics of Fusion," Chapter 31 in Spinal Stenosis, Anderson, G. B J., pp 403-414, Mosby from Chicago, 1992.
2. Haughton VM, An HS, **Lim TH**, Nowicki BH: "New Horizons in Imaging," in Low Back Pain: A Scientific and Clinical Overview, Eds. Weinstein JN and Gordon SL, pp. 643-662, American Academy of Orthopaedic Surgeons, Rosemont, IL, 1997.
3. **Lim TH** and An HS: "Biomechanics of Spine Surgery," Chapter 3 in Principles and Techniques of Spine Surgery, An, H.S., Williams & Wilkins, Baltimore, pp. 63-89, 1997.
4. **Lim TH** and An HS: "Biomechanics of Spinal Instrumentation," Spinal Instrumentation 2nd edition, Eds: Howard S. An and Jerome Colter, Williams & Wilkins, pp. 59-84, 1999.

JOURNAL PUBLICATIONS

1. Goel VK, Kim YE, **Lim TH**, and Weinstein JN: "An Analytical Investigation of the Mechanics of Spinal Instrumentation," Spine, vol. 13, No. 9, 1003-1011, 1988.
2. Goel VK and **Lim TH**: "Mechanics of Spondylolisthesis," Seminars in Spine Surgery, Vol 1, No 2, 95-99, 1989.
3. Kim YE, Goel VK, Weinstein JN, and **Lim TH**: "Possible Role of Stresses in Inducing Spinal Stenosis - A Long Term Complication Following Disc Excision," Journal of Biomechanical Engineering, Vol. 112, No. 4, 478-481, 1990.
4. Goel V K, **Lim TH**, Gwon J, Chen JY, Winterbottom JM, Park JB, Weinstein JN, and Ahn JY: "Effects of Rigidity of an Internal Fixation Device - A Comprehensive Biomechanical Investigation," Spine Vol. 16, No. 3 Supplement, S155-S161, 1991.
5. Kim YE, Goel VK, Weinstein JN, and **Lim TH**: "Effect of Disc Degeneration at One Level on the Adjacent Level in Axial Mode," Spine, Vol. 16. No. 3, 331-335, 1991.
6. Gwon J, Chen JY, **Lim TH**, Han J, Winterbottom JM, and Goel VK: "In-vitro Comparative Biomechanical Analysis of Transpedicular Screw Instrumentations in the Lumbar Region of the Human Spine," J Spinal Disorders 4:437-443, 1991.
7. Goel VK, Gwon J, Chen JY, and **Lim TH**: "Biomechanics of Internal Fixation System," Seminars in Surgery 4(3):128-135, 1992.
8. Goel VK, **Lim TH**, Gilbertson LG, and Weinstein JN: "Clinically Relevant Finite Element Models of a Ligamentous Lumbar Motion Segment," Seminars in Spine Surgery 5(1):29-41, 1993.
9. **Lim TH** and Goel VK: "Biomechanical Aspects of Spondylolisthesis," Seminars in Spine Surgery , 5(4):1-7, 1993
10. **Lim TH**, Goel VK, Park JB, Winterbottom JM, Ahn J, Gwon J, and Weinstein JN: "Comparison of Stress-induced Porosity due to Conventional and a Modified Spinal Fixation Device," J Spinal Disorders, 7(1):1-11, 1994.
11. **Lim TH**, Goel VK, and Kong W: "Stress Analysis of a Canine Ligamentous Motion Segment Using the Finite Element Technique," J Biomechanics, 27(10):1259-1269, 1994.
12. An HS, Xu R, **Lim TH**, McGrady L, and Wilson C: "Prediction of Pelvic Bone Graft Strength using Dual Energy X-ray Absorptiometry," Spine 19(20):2358-2363, 1994.
13. **Lim TH**, An HS, Evanic C, Hasanoglu Y, and McGrady L: "Strength of Anterior Vertebral Screw Fixation in Relation to Bone Mineral Density," J Spinal Disorders 7(2):121-125, 1995.
14. An HS, **Lim TH**, You JW, Hong JH, Eck J, and McGrady L: "Biomechanical Evaluation of Segmental Anterior Spinal Instrumentation," Spine, 20:1979-1983, 1995.

15. Toth JM, An HS, **Lim TH**, Lundberg W, Ran Y, Weiss N, Xu R, Nguyen C, and Lynch K: "Effect of porous Biphasic Calcium Phosphate Ceramics for Anterior Cervical Interbody Fusion in a Caprine Model" Spine, 20:2203-2210, 1995.
16. **Lim TH**, Hasegawa T, An S, McGrady L, and Hasanoglu KY: "Prediction of Fatigue Screw Loosening in Anterior Spinal Fixation Using Dual Energy X-Ray Absorptiometry," Spine 20:2565-2569, 1995.
17. Abuzzahab FS, **Lim TH**, Harris GF, Hasegawa T, and Kidder SM: "A Method for Covering Surfaces of Reflective Gait Markers," Gait & Posture, 3:164-165, 1995.
18. Slovenkai MP, Linehan D, McGrady L, **Lim TH**, Harris GF, and Shereff MJ: "Comparison of Two Methods of Fixation of Oblique Lesser Metatarsal Fractures," Foot and Ankle, 16(7):437-439, 1995.
19. Inufusa A, An HS, Lim TH, Haughton VM, Nowicki BH: "The Relationship between Facet Joint Morphology and Flexion-extension Movement," Kawasaki Med Journal 22:15-22, 1996.
20. Inufusa A, An HS, Glover JM, McGrady L, **Lim TH**, and Riley LH: "The Ideal Amount of Lumbar Foraminal Distraction for Pedicle Screw Instrumentation," Spine 21(19):2218-2223, 1996.
21. Inufusa A, An HS, **Lim TH**, Hasegawa T, Haughton VM, and Nowicki BH: "Anatomic Changes of the Intervertebral Foramen Associated with Flexion-extension Movement," Spine 21(21):2412-2420, 1996.
22. **Lim TH**, Eck JC, An HS, Ahn JY, You JW, Hong JH, and McGrady LM: "Biomechanics of Transfixation in Pedicle Screw Instrumentation," Spine 21(19):2224-2229, 1996.
23. Nowicki BH, Haughton VM, Schmidt TA, **Lim TH**, An HS, Riley LH, Yu L, and Hong JH: "The Effect of Disc Degeneration on the Incidence of Occult Lumbar Lateral Spinal Stenosis," American Journal of Neuroradiology 17:1605-1614, 1996.
24. **Lim TH**, An HS, You JW, Hong JH, Ahn JY, Eck JC, and McGrady LM: "Biomechanical Comparison between Anterior Fixation vs. Posterior Fixation in an Unstable Calf Spine Model," Spine 22(3):261-266, 1997.
25. Riley LH, Eck JC, Yoshida H, Toth JM, Cahn N, **Lim TH**, and McGrady LM: "Laparoscopic Assisted Fusion of the Lumbosacral Spine," Spine 22:1407-1412, 1997.
26. **Lim TH**, Eck J, An HS, McGrady LM, and Harris GF: "A Non-invasive Three Dimensional Spinal Motion Analysis Method," Spine 22(17):1996-2000, 1997.
27. Black KP, **Lim TH**, McGrady LM, and Raasch W: "In Vitro Evaluation of Shoulder External Rotation Following a Bankart Reconstruction," The American Journal of Sports Medicine 25(4):449-453, 1997.
28. Gosain AK, Capel CC, Song L, Carro MA, and **Lim TH**: "Biomechanical and Histologic Alteration of Facial Recipient Bone following Reconstruction with Autogenous Bone Graft and Alloplastic Implants: A One Year Study." Plastic and Reconstructive Surgery 101(6):1561-1571, 1998.
29. **Lim TH** and Goel VK: "Load Sharing Characteristics in the Stabilized Lumbar Motion Segment: A Finite Element Study," J. Musculoskeletal Research 2(1):55-64, 1998.
30. Humphreys SC, An HS, Eck JC, Coppes M, **Lim TH**, and Eskowski L: "Oblique MRI as a Useful Adjunct in Evaluation of Cervical Foraminal Impingement," Journal of Spinal Disorders 11(4):295-299, 1998.
31. **Lim TH** and Hong J: "Poroelastic Model of Trabecular Bone in Uniaxial Strain Condition," J of Musculoskeletal Research 2(2):167-180, 1998.
32. Schmidt TA, An HS, **Lim TH**, Nowicki BH, Haughton VM: "The Stiffness of Lumbar Spinal Motion Segments with a High-Intensity Zone in the Annulus Fibrosus," Spine 23(20):2167-2173, 1998.
33. Humphreys SC, An HS, Glover JM, Eck JC, McGrady LM, Inufusa A, and **Lim TH**: "A Comparison between Anterior Threaded Cages vs. Posterior Pedicle Screw Instrumentation in terms of Foraminal Distraction and Lumbar Lordosis," J of Musculoskeletal Research 2(4):315-323, 1998.
34. You JW, **Lim TH**: "Biomechanical Evaluation of Supplemental Hook and Screw Fixation in Short Segment Spinal Instrumentation," Journal of Korean Spine Society 5(1):1-8, 1998. (written in Korean)
35. **Lim TH**, Jeon CH, An HS: "Biomechanical Considerations for Spondylolisthesis," Seminars in Spine Surgery 11(1):1-9, 1999.
36. Haughton VM, **Lim TH**, An HS: "Intervertebral Disk Appearance Correlated with Stiffness of Lumbar Spinal Motion Segments," Am J Neuroradiology 20:1161-1165, 1999.
37. **Lim TH**, Patwardhan AG, Hong JH, An HS, Riley LH, Hodges S, and Zindrick MR: "Effect of Instrumented Fusion on the Biomechanics of Adjacent Segment - An In Vivo Canine Study," J Musculoskeletal Research 3(2):125-136, 1999.

38. Kwon H, An HS, **Lim TH**, Jeon CH: Effect of bone mineral density and endplate thickness on the compressive strength in the cervical spine. Journal of Korean Spine Society 6(3):344-348, 1999. (written in Korean)
39. Haughton VM, Schmidt TA, Keele K, An HS, **Lim TH**: The flexibility of lumbar spinal motion segments correlated to type of type of tears in the annulus fibrosus. J Neurosurgery 92:81-86, 2000.
40. Lee SW, **Lim TH**, An HS, You JW: Biomechanical effect of anterior grafting devices on the rotational stability of spinal construct. J Spinal Disord 13(2):150-155, 2000.
41. **Lim TH**, Hong JH: "Poroelectric Properties of Bovine Vertebral Trabecular Bone," J Orthop Res 18(4):671-677, 2000.
42. Fujiwara A, Tamai K, An HS, Kurihashi A, **Lim TH**, Yoshida H, Saotome K: The relationship among disc degeneration, facet joint osteoarthritis and stability of the degenerative lumbar spine. J Spinal Disord 13(5):444-450, 2000.
43. Fujiwara A, Tamai K, Yoshida A, Kurihashi A, Saotome K, An HS, **Lim TH**: Anatomy of the iliolumbar ligament. Clin Orthop Rel Res 380:167-172, 2000.
44. Fujiwara A, **Lim TH**, An HS, Tanaka N, Jeon CH, Andersson GBJ, Haughton VM: The effect of disc degeneration and facet joint osteoarthritis on the segmental flexibility of the lumbar spine. Spine 25(23):3036-3044, 2000.
45. Koh YD, An HS, **Lim TH**, You JW, Eck JC, McGrady LM: A Biomechanical Comparison between Modern Anterior versus Posterior Plate Fixation in an Unstable Cervical Spine Model. Spine 26(1):15-21, 2001.
46. Tanaka N, An HS, **Lim TH**, Fujiwara A, Jeon CH, Haughton VM: The relationship between disc degeneration and flexibility of the lumbar spine. The Spine Journal 1(1):46-56, 2001.
47. Fujiwara A, An HS, **Lim TH**, Haughton VM: Morphologic changes in the lumbar intervertebral foramen due to flexion/extension, lateral bending, and axial rotation: An in vitro anatomical and biomechanical study. Spine 26(8):876-882, 2001.
48. Fujiwara A, Tamai K, An HS, **Lim TH**, Yoshida H, Kurihashi A, Saotome K: Orientation and osteoarthritis of the lumbar facet joint. Clin Orthop Rel Res 385:88-94, 2001.
49. **Lim TH**, Kwon H, Jeon CH, Sokolowski M, Kim J, Natarajan R, An HS, Andersson GBJ: Effect of Endplate Conditions and Bone Mineral Density on the Compressive Strength of the Graft-Endplate Interface in the Anterior Cervical Fusion. Spine 26(8):951-956, 2001.
50. **Lim TH**, Kim JG, Fujiwara A, Yoon TT, Lee SC, Ha JW, An HS: Biomechanical evaluation of diagonal transfixation in pedicle screw instrumentation. Spine 26(22):2498 – 503, 2001.
51. **Lim TH**, Brebach G, Renner SM, Kim WJ, Kim JG, An HS, Andersson GBJ: Biomechanical evaluation of a new calcium phosphate cement for vertebroplasty. Spine 27(12):1297-302, 2002.
52. Eck JC, Humphreys SC, **Lim TH**, Jeong ST, Kim JG, Hodges SD, An HS: Biomechanical study on the effect of cervical spine fusion on adjacent-level intradiscal pressure and segmental motion. Spine 27(22):2431-2434, 2002.
53. Didonna ML, Fernandez JJ, **Lim TH**, Hastings H 2nd, Cohen MS: Partial olecranon excision: The relationship between triceps insertion site and extension strength of the elbow. J Hand Surg [Am] 28(1): 117-122, 2003.
54. Turner TM, Urban RM, Hall DJ, Cheema N, **Lim TH**: Restoration of large bone defects using a hard-setting, injectable putty containing demineralized bone particles compared to cancellous autograft bone. Orthopedics 26(5 Suppl.):S561-S565, 2003.
55. Urban RM, Turner TM, Hall DJ, Infanger S, Cheema N, **Lim TH**: Healing of large defects treated with calcium sulfate pellets containing demineralized bone matrix particles. Orthopedics 26(5 Suppl.):S581-S585, 2003
56. Kim KW, **Lim TH**, Kim JG, An HS: Origin of chondrocytes and fibroblasts in the nucleus pulposus: the cells replace the notochordal nucleus pulposus with fibrocartilage. Spine 28(10):982 – 990, 2003.
57. Natarajan RN, Garretson RB III, Biyani A, **Lim TH**, Andersson GBJ, An HS: Effects of slip severity and loading directions on the stability of isthmic spondylolisthesis: A finite element model study. Spine 28(11):1103 – 1112, 2003.
58. Singh K, Vaccaro AR, Kim J, Lorenz E, **Lim TH**, An HS: Biomechanical comparison of cervical spine reconstructive techniques after a multilevel corpectomy of the cervical spine. Spine 28(20):2352-8, 2003.

59. An HS, Singh K, Vaccaro R, Wang G, Yoshida H, Eck J, McGrady M, **Lim TH**: Biomechanical evaluation of contemporary posterior spinal fixation configurations in an unstable burst-fracture calf spine model: Special references of hook configurations and pedicle screws. Spine 29(3):257-262, 2004.
60. Singh K, Vaccaro AR, Kim J, Lorenz E, **Lim TH**, An HS: Enhancement of stability following anterior cervical corpectomy: a biomechanical study. Spine 29(8):845-9, 2004.
61. Renner SM, **Lim TH**, Katolic L, Kim WJ, Brebach G, An HS, Andersson GBJ: Augmentation of pedicle screw fixation strength using an injectable calcium phosphate cement as a function of injection timing and method. Spine 29:E212-E216, 2004.
62. Riley LH, III, Eck JC, Yoshida H, Koh YD, You JW, **Lim TH**: A biomechanical comparison of calf versus cadaver lumbar spine models. Spine 29:E217-E220, 2004.
63. Urban RM, Turner TM, Hall DJ, Infanger SI, Cheema N, **Lim TH**, Moseley J, Carroll M, Roark M: Effects of altered crystalline structure and increased initial compressive strength of calcium sulfate bone graft substitute pellets on new bone formation. Orthopedics 27(1 Suppl):s113-8, 2004.
64. Eichholz KM, Hitchon PW, From A, Rubenbauer P, Nakamura S, **Lim TH**, Torner J. Biomechanical Testing of Anterior and Posterior Thoracolumbar Instrumentation in the Cadaveric Spine. Journal of Neurosurgery: Spine 1(1):116-21, 2004.
65. Hitchon PW, Eichholz KM, Barry C, Rubenbauer P, Ingalhalikar A, Nakamura S, **Lim TH**, Torner J. Biomechanical Studies of an Artificial Disc Implant in the Human Cadaveric Spine. Journal of Neurosurgery: Spine 2(3):339-343, 2005.
66. Hasegawa T, Inufusa A, Imai Y, Mikawa Y, **Lim TH**, An HS: Hydroxyapatite-coating of pedicle screws improves resistance against pull-out force in the osteoporotic canine lumbar spine model: a pilot study. Spine J. 2005 May-Jun;5(3):239-43.
67. **Lim TH**, Ramakrishnan PS, Kurriger GL, Martin JA, Stevens JW, Kim J, Mendoza SA: Rat spinal motion segment in organ culture: A cell viability study. Spine 31(12):1291-7, 2006 (May 20).
68. Ochia RS, Inoue N, Renner MS, Lorenz EP, **Lim TH**, Andersson GBJ, An HS: Three-dimensional in vivo measurement of lumbar spine segmental motion. Spine 31(18):2073-2078, 2006 (Aug 15).
69. Kim KW, Ha KY, Park JB, Nam SW, Woo YK, **Lim TH**, An HS: Notochordal cells induce chemotaxis of cartilage-endplate chondrocytes in vitro motility assays. (submitted for publication in Journal of Orthopaedic Research).
70. **Lim TH**, Youn BD, Han KS, Kim YH, Choi KK: Roles of Lumbar Muscles in Creating the Follower Load in a Quiet Standing Posture. (In preparation).

CONFERENCE ABSTRACTS

1. Goel VK, Kim YE, **Lim TH**, and Weinstein JN: "Mechanics of Load Transfer across a Spinal Fixation Device," Presented at the 35th Annual Meeting, Orthopaedic Research Society, Las Vegas, Nevada, February 6-9, 1989.
2. **Lim TH**, Goel VK, Winterbottom JM, Newton M, Glaser J, Weinstein JN, and Park JB: "Short Term Effects on the Mechanics of a Stabilized Motion Segment - A Canine Study," presented at the 16th Annual Meeting of the International Society for the Study of Lumbar Spine, Kyoto, Japan, May 15-19, 1989.
3. **Lim TH**, Goel VK, Park JB, Winterbottom JM, Kessler B, Gwon JK, and Weinstein JN: "Quantification of the Stress-induced Bone Porosity as a Function of the Rigidity of a Fixation Device," presented at the 17th Annual Meeting of the International Society for the Study of the Lumbar Spine, Boston, MA, June 13-17, 1990.
4. Goel VK and **Lim TH**: "Finite Element Modeling of the Spinal Surgery," presented at the First World Congress of Biomechanics, LaJolla, CA, August 30 - September 4, 1990.
5. Goel VK, **Lim TH**, Gwon J, Chen JY, Winterbottom JM, Park JB, Weinstein JN, and Ahn JY: "Biomechanical Effects of Rigidity of an Internal Fixation Device: A Comprehensive Biomechanical Investigation," The Proceedings of the 18th Annual Meeting of the International Society for the Study of the Lumbar Spine, pp. 25, Heidelberg, Germany, May 12-16, 1991.
6. **Lim TH** and Goel VK: "Load Bearing Characteristics of the Stabilized Motion Segment as a Function of the Rigidity of a Fixation Device: A Finite Element Study," Proceedings of the 18th Annual Meeting of

- the International Society for the Study of the Lumbar Spine, pp. 51, Heidelberg, Germany, May 12-16, 1991.
7. **Lim TH** and Goel VK: "Stress Analysis of a Canine Ligamentous Motion Segment using the Finite Element Technique," Presented in the 38th Annual Meeting of Orthopaedic Research Society, Washington D.C., February 17-20, 1992, pp144.
 8. **Lim TH**, Patwardhan A, Li S, Chandran K, Meade K, and Havey R.: "Effect of Low-Calcium Diet on the Viscoelastic Properties of the Intervertebral Disc - A Canine Model," Presented in the 38th Annual Meeting of Orthopaedic Research Society, Washington D.C., February 17-20, 1992, pp192.
 9. Goel VK, **Lim TH**, Gwon J, Chen J, Winterbottom JM, Park JB, Weinstein JN, and Ahn JY: "Biomechanics of a Stabilized Motion Segment as Affected by the Rigidity of a Fixation Device," Presented in the 38th Annual Meeting of Orthopaedic Research Society, Washington D.C., February 17-20, 1992.
 10. **Lim TH**, Goel VK, Park JB, and Weinstein JN: "The Role of Decreasing Rigidity of an Internal Fixation Device - A Finite Element Study," Presented in the 19th Annual Meeting of the International Society for the Study of the Lumbar Spine, pp 26, Chicago, IL, May 20-24, 1992, pp120.
 11. **Lim TH**, Goel VK, and Weinstein JN: "Effects of Spinal Instrumentation on Biomechanics of a Spinal Motion Segment - A Comparison of Canine and Human Models," Presented in the 19th Annual Meeting of the International Society for the Study of the Lumbar Spine, pp 28, Chicago, IL, May 20-24, 1992.
 12. Patwardhan A, **Lim TH**, Vailas A, Li S, Chandran K, Meade K, Havey R, Wagner G, Dillehay M, and Lorenz M: "Energy Transfer Characteristics of Lumbar Discs in Spinal Osteoporosis - A Canine Calcium Deficiency Model," 19th Annual Meeting of the International Society for the Study of the Lumbar Spine, pp 234 Chicago, IL, May 20-24, 1992.
 13. **Lim TH**, Goel VK, Weinstein JN, and Kong W: "Stress Analysis of a Canine Spinal Motion Segment Using Finite Element Technique," BED-Vol. 22, Advances in Bioengineering, ASME, 1992, pp345.
 14. Li S, Patwardhan A, Amirouche F, **Lim TH**, Havey R, and Meade K: "Development of a Viscoelastic Solid Model of a Spinal Segment using Constrained Optimization," BED-Vol. 22, Advances in Bioengineering, ASME, 1992, pp75.
 15. An HS, **Lim TH**, Evanich C, Hasanoglu KY, and McGrady L: "Strength of the Anterior Vertebral Screw Fixation in Relation to Bone Mineral Density," Presented in 1993 ASME/AICHE/ASCE Summer Bioengineering Conference, June 25-29, 1993, Breckenridge, Colorado.
 16. **Lim TH**, Goel VK, and Kong W: "Spinal Fixation using Polymer Plate-Metal Pedicle Screws - A Finite Element Study," Presented in 19th World Congress of SICOT, Seoul, Korea, August 28 - September 3, 1993.
 17. McGrady L, Black KP, **Lim TH**, Fagan D, and Raasch W: "Biomechanical Evaluation of the Effects of Bankart Reconstruction Surgery on the Externally Rotated Shoulder," Presented in the Annual Meeting of American Society of Biomechanics, Iowa City, Iowa, October 22-24, 1993.
 18. Black KP, Snyder MJ, McGrady L, **Lim TH**, and Harris GF: "In Vitro and In Vivo Evaluation of Interference Fit Fixation during ACL Reconstruction," Presented in the 61st Annual Meeting, American Academy of Orthopaedic Surgeons, Feb 24-28, 1994, New Orleans, LA.
 19. **Lim TH**, Hasegawa T, An HS, McGrady L, and Hasanoglu KY: "Anterior Vertebral Screw Loosening in Relation to Bone Mineral Density," Poster presented in the 40th Annual Meeting, Orthopaedic Research Society, Feb 21-24, 1994, New Orleans, LA.
 20. Toth JM, **Lim TH**, An HS, Xu R, Ran Y, and McGrady L: "Comparison of Compressive Strengths of Iliac Bone Grafts and Porous Calcium Phosphate Ceramics for Spinal Fusion," Poster presented in the 40th Annual Meeting, Orthopaedic Research Society, Feb 21-24, 1994, New Orleans, LA.
 21. **Lim TH**, An HS, Xu R, McGrady L, and Wilson C: "Prediction of Pelvic Bone Graft Strength using Dual Energy X-ray Absorptiometry," Poster presented in the 40th Annual Meeting, Orthopaedic Research Society, Feb 21-24, 1994, New Orleans, LA.
 22. Black KP, **Lim TH**, McGrady L, Fagan D, and Raasch W: "In vitro Evaluation of Shoulder External Rotation following a Bankart Reconstruction," Presented in the 40th Annual Meeting, Orthopaedic Research Society, Feb 21-24, 1994, New Orleans, LA.
 23. **Lim TH** and Hong JH: "A Poroelastic Model of Trabecular Bone in Uniaxial Strain Condition," Presented in the Winter Annual Meeting, ASME, Nov. 6-11, 1994.

24. You JW, **Lim TH**, An HS, Hong JH, Eck J, and McGrady L: "Biomechanical Evaluation of Segmental Anterior Spinal Instrumentation," Presented at the 9th Annual Meeting of North American Spine Society, October 19-22, 1994, Minneapolis, Minnesota.
25. An HS, **Lim TH**, Evanich C, Hasegawa H, Hasanoglu KY, and McGrady L: "Pull-out and Cyclic Failures of the Anterior Vertebral Screw Fixation in Relation to Bone Mineral Density," Presented at the 9th Annual Meeting of North American Spine Society, October 19-22, 1994, Minneapolis, Minnesota.
26. An HS, Toth JM, **Lim TH**, Lundberg W, Ran Y, Weiss N, Xu R, and Lynch K: "Effect of Porosity of a 50/50 HA/TCP Fusion in a Goat Model," Presented at the 22nd Annual Meeting of Cervical Spine Research Society, November 29 - December 2, 1994, Baltimore, Maryland.
27. Toth JM, **Lim TH**, An HS, Lundberg W, Ran Y, Weiss N, Xu R, Nguyen C, and Lynch K: "Effect of Porosity of 50/50 HA/ -TCP Calcium Phosphate Ceramics for Anterior Cervical Interbody Fusion" Accepted for poster presentation in the 41st Annual Meeting, Orthopaedic Research Society, Feb 13-16, 1995, Orlando, Florida.
28. An HS, **Lim TH**, You JW, Hong JH, Ahn JY, Eck JC, and McGrady LM: "Biomechanical Comparison between Anterior Fixation vs. Posterior Fixation in an Unstable Calf Spine Model," Poster presented in the 22nd Annual Meeting of the International Society for the Study of the Lumbar Spine, 1995.
29. Riley LH, **Lim TH**, An HS, LM McGrady: "Cyclic Fatigue Failure of the Pedicle Screw Fixation in Relation to Bone Mineral Density." Poster presented in the 22nd Annual Meeting of the International Society for the Study of the Lumbar Spine, 1995.
30. Inufusa A, An HS, Hasegawa T, **Lim TH**, and Haughton VM: "Changes of Intervertebral Foramen associated with Flexion-Extension Movements: A Cryomicrotomic Study," Presentation in the 22nd Annual Meeting of the International Society for the Study of the Lumbar Spine, 1995.
31. Ahn JY, **Lim TH**, An HS, Eck JC, You JW, Hong JH, and McGrady LM: "Biomechanics of Transfixation in Pedicle Screw Instrumentation," Poster presented in the 22nd Annual Meeting of the International Society for the Study of the Lumbar Spine, 1995.
32. Inufusa A, An HS, **Lim TH**, Haughton VM, and Nowicki BH: "Anatomic Changes of the Spinal Canal and the Intervertebral Foramen associated with Lumbar Segmental Instability," Poster presented in the 22nd Annual Meeting of the International Society for the Study of the Lumbar Spine, 1995.
33. **Lim TH**, An HS, Eck J, and Ahn JY: "Effects of Crosslinking Devices in Pedicle Screw Instrumentation: A Biomechanical and Finite Element Modeling Study," Presented in the Annual Meeting of Scoliosis Research Society, September, 1995.
34. **Lim TH**, Riley LH, An HS, and McGrady L: "Prediction of Fatigue Loosening in Pedicle Screw Fixation," Presented in ASME Winter Annual Meeting, November, 1995.
35. **Lim TH**, Patwardhan AG, Hong JH, An HS, Riley LH, Hodges H, and Zindrick MR: "Effect of Instrumented Fusion on the Biomechanics of Adjacent Segment - An In Vivo Canine Study." Presented in the 42nd Annual Meeting, Orthopaedic Research Society, Feb 19-22, 1996, Atlanta, GA.
36. **Lim TH**, An HS, Haughton VM, Hong JH, Nowicki B, You L, and Yoshida H: "Biomechanical Characteristics of Radial Tear of the Annulus Fibrosus," Presented in the 42nd Annual Meeting, Orthopaedic Research Society, Feb 19-22, 1996, Atlanta, GA.
37. An HS, Haughton VM, **Lim TH**, Hong JH, Nowicki B, You L, and Yoshida H: "The Relationship between Disc Degeneration and Kinematic Characteristics of the Lumbar Motion Segment," Poster presentation in the 42nd Annual Meeting, Orthopaedic Research Society, Feb 19-22, 1996, Atlanta, GA.
38. Gosain AK, Capel CC, Song L, Carro MA, Tobola MK, **Lim TH**, and McCarthy JG: "Biomechanical and Histologic Alteration of Facial Recipient Bone following Reconstruction with Autogenous Bone Graft and Alloplastic Implants: A One Year Study," Presented in Annual Meeting of American Association of Plastic Surgeons, April 1996. (Winning First Place in the Basic Science Category-Senior Division of the 1996 PSEF Scholarship Essay Contest)
39. Humphreys SC, An HS, McGrady LM, **Lim TH**, Glover JM, and Inufusa A: "A comparison between anterior threaded cages vs. posterior pedicle screw instrumentation in terms of foraminal distraction and lumbar lordosis," Presented the 23rd Annual Meeting of the International Society for the Study of the Lumbar Spine, 1996.
40. **Lim TH**, Eck J, An HS, McGrady LM, and Harris GF: "A Non-invasive Three Dimensional Spinal Motion Analysis," Presented in the International Society for the Study of the Lumbar Spine, 1996.

41. Hong HJ and **Lim TH**: "Poroelastic Model of Vertebral Trabecular Bone in the Uniaxial Stress Condition and Experimental Validation," (poster presentation in the 1996 IMECE & ASME-WAM, Atlanta, Georgia, November 19-22, 1996).
42. **Lim TH** and Hong JH: "Poroelastic Properties of Vertebral Trabecular Bone," (poster presentation in the 1996 IMECE & ASME-WAM, Atlanta, Georgia, November 19-22, 1996).
43. **Lim TH**, An HS, Haughton VM, You L, and Yoshida H: "The Effect of Disc Degeneration on the Kinematic Characteristics of the Lumbar Motion Segment," (Presented in the 1996 IMECE & ASME-WAM, Atlanta, Georgia, November 19-22, 1996).
44. Toth JM, **Lim TH**, An HS, Yoshida H, Roh J, Pagedas MT, Eck JC, Nguyen CM: "Enhancement of cervical spine fusion with reinforced porous 50/50 HA/ β -TCP loaded with rhBMP-2 in a caprine model." (presented in the 43rd Annual Meeting, Orthopaedic Research Society, Feb 9-14, 1997, San Francisco, CA).
45. **Lim TH**, Eck JC, Riley LH, Yoshida H: "Use of calf lumbar spine models for the test of spinal instrumentation." (presented in the 1997 IMECE & ASME-WAM, Dallas, Texas, November 16-21, 1997).
46. **Lim TH**, Koh YD, An HS, McGrady LM: A biomechanical comparison between modern anterior versus posterior plate fixation of unstable cervical spine injuries. (presented in the 1997 IMECE & ASME-WAM, Dallas, Texas, November 16-21, 1997).
47. **Lim TH**, An HS, Koh YD, You JW, McGrady LM: "Biomechanical comparison of anterior versus posterior fixation of unstable cervical spine injuries," (poster presented in the 44th Annual Meeting, Orthopaedic Research Society, 1998, New Orleans, LA).
48. **Lim TH**, Hoepfner P, McGrady LM, Young CC, Raasch WG: "Biomechanical effect of in-line skating wrist guards on the prevention of wrist fracture," (poster presented in the 44th Annual Meeting, Orthopaedic Research Society, 1998, New Orleans, LA).
49. Hong JH, Ahn JY, **Lim TH**, An HS: "Correlation among permeability, apparent density, and porosity of the vertebral trabecular bone," (presented in the 44th Annual Meeting, Orthopaedic Research Society, 1998, New Orleans, LA).
50. **Lim TH** and Goel VK: "Effect of intervertebral joint stiffness changes on the load sharing characteristics in the stabilized lumbar segment," (presented in the 25th Annual Meeting of the International Society for the Studies of the Lumbar Spine, 1998, Brussels, Belgium).
51. Patwardhan A, Havey R, Diener H, Ghanayem A, Meade K, **Lim TH**: A follower load stabilizes the lumbar spine without compromising mobility in the sagittal plane. (presented in the 26th Annual Meeting of the International Society for the Studies of the Lumbar Spine, 1999, Hawaii).
52. Jeon CH, Kim HK, An HS, Kim SK, Kang SY, **Lim TH**: Neovascularization and basic fibroblast growth factor (bFGF) expression in the annulus fibrosus are associated with aging and disc degeneration. (poster presented in the 26th Annual Meeting of the International Society for the Studies of the Lumbar Spine, 1999, Hawaii).
53. Fujiwara A, Tamai K, Serisawa M, Yoshida H, Kurihashi A, An HS, **Lim TH**: Anatomy of the iliolumbar ligament. (poster presented in the 26th Annual Meeting of the International Society for the Studies of the Lumbar Spine, 1999, Hawaii).
54. **Lim TH**, Fujiwara A, Tanaka N, Jeon CH, Kim J, Garretson R, An HS, Andersson GBJ, Havey R, Patwardhan AG: Effect of follower load on the lumbar segmental motion. (poster presented in the 26th Annual Meeting of the International Society for the Studies of the Lumbar Spine, 1999, Hawaii).
55. Tanaka N, An HS, **Lim TH**, Fujiwara A, Jeon CH, Haughton VM: The relationship between disc degeneration and segmental spinal instability of the lumbar spine. (presented in the 14th Annual Meeting of the North American Spine Society, 1999, Chicago, IL).
56. An HS, Kwon H, **Lim TH**, Jeon CH, Natarajan R, Sokolowski M, Kim J, Andersson GBJ: Effect of endplate condition and bone mineral density on the compressive strength of the graft-endplate interphase in the cervical spine. (presented in the 14th Annual Meeting of the North American Spine Society, 1999, Chicago, IL).
57. Patwardhan A, Havey R, Diener H, Ghanayem A, Meade K, **Lim TH**: Follower load stabilizes the lumbar spine without compromising sagittal mobility. (presented in the 14th Annual Meeting of the North American Spine Society, 1999, Chicago, IL).

58. **Lim TH**, Fujiwara A, An HS, Tanaka N, Haughton VM, Andersson GBJ: The effect of degenerative changes in the intervertebral disc and facet joints on the segmental flexibility of the lumbar spine. (presented in 46th Annual Meeting of the Orthopaedic Research Society, 2000, Orlando, FL).
59. Patwardhan AG, Havey R, Meade KP, **Lim TH**, Carandang G, Vornov L, Diener H, Ghanayem A, Zindrick MM: A follower load stabilizes the lumbar spine with minimal changes in sagittal plane mobility. (poster presented in 46th Annual Meeting of the Orthopaedic Research Society, 2000, Orlando, FL).
60. Fujiwara A, An H, **Lim TH**, Tanaka N, Jeon C, Andersson G: Lumbar segmental motion characteristics vary with degenerative changes in the disc and facet joints. (presented in the 27th Annual Meeting of the International Society for the Studies of Lumbar Spine, Adelaide, Australia, April 9-13, 2000).
61. Fujiwara A, An H, **Lim TH**, Haughton V: Morphologic changes in the lumbar intervertebral foramen due to flexion/extension, lateral bending and axial rotation: An in vitro anatomical and biomechanical study. (presented in the 27th Annual Meeting of the International Society for the Studies of Lumbar Spine, Adelaide, Australia, April 9-13, 2000).
62. An H, **Lim TH**, Fujiwara A, Lee S, Kim J, Yoon T: Mechanical evaluation of diagonal transfixation in pedicle screw instrumentation. special poster presentation in the 27th Annual Meeting of the International Society for the Studies of Lumbar Spine, Adelaide, Australia, April 9-13, 2000).
63. **Lim TH**, Brebach GT, Renner SM, Kim WJ, Kim JG, An HS, Andersson GBJ: Effect of injectable calcium phosphate cement on the compressive vertebral body strength in vertebroplasty. (poster presented in 47th Annual Meeting of the Orthopaedic Research Society, 2001, San Francisco, CA and presented presentation in the 28th Annual Meeting of the International Society for the Studies of Lumbar Spine, Edinburgh, Scotland, 2001).
64. Renner SM, Kim WJ, Kotalik L, **Lim TH**, An HS: Pedicle screw augmentation using injectable calcium phosphate cement. presented in ASME Summer Bioengineering Conference, Snowbird, Utah, 2001.
65. **Lim TH**, Kim WJ, Renner SM, Kotalic L, An HS: Augmentation of pedicle screw fixation strength using an injectable calcium phosphate cement as a function of injection timing and method. Presented in 48th Annual Meeting of the Orthopaedic Research Society, 2002, Dallas.
66. Kim JG, **Lim TH**, Kim KW, Masuda K, An HS: A novel biomechanical culture system for the studies of the intervertebral disc. Poster presented in 48th Annual Meeting of the Orthopaedic Research Society, 2002, Dallas.
67. Urban RM, Turner TM, Hall DJ, Cheema N, **Lim TH**: A hard-setting, injectable putty containing demineralized bone particles compared to cancellous autograft bone for the reconstruction of large bone defects. Presented in 29th Annual Meeting and Exposition of Society for Biomaterials, Reno, Nevada, 2003.
68. Kuroda S, Viridi AS, Healy KE, Li P, Sumner DR, **Lim TH**, Nelson CJ, Minevski ZS, Jacobs JJ: Low temperature hydroxiapatite coating enhances early implant fixation. Presented in 29th Annual Meeting and Exposition of Society for Biomaterials, Reno, Nevada, 2003.
69. Turner TM, Cohen MS, Ramakrishnan P, **Lim TH**, Urban RM. Tendon function and morphology related to distal radius fracture fixation plates of different materials and designs in a canine forelimb model. Presented in 29th Annual Meeting and Exposition of Society for Biomaterials, Reno, Nevada, 2003.
70. Turner TM, Urban RM, **Lim TH**, Tomlinson MJ, Renner SM, Hall DJ, An HS. Biomechanical and histological evaluation of vertebroplasty using injectable calcium phosphate cement compared to polymethylmethacrylate in a unique vertebral body large defect model. Presented in 29th Annual Meeting and Exposition of Society for Biomaterials, Reno, Nevada, 2003.
71. Urban RM, Turner TM, Hall DJ, Infanger SI, Cheema N, **Lim TH**. The amount and strength of newly-formed bone after 26 weeks in large medullary defects treated with calcium sulfate pellets containing demineralized bone particles. Presented in 29th Annual Meeting and Exposition of Society for Biomaterials, Reno, Nevada, 2003.
72. Urban RM, Turner TM, Hall DJ, Skipor AK, Infanger SI, **Lim TH**, Nelson CJ, Minevski ZS, Jacobs JJ, Voegel J. Increased bone and marrow and reduced fibrous tissue at Ti-alloy implant surfaces with electrolytic phosphate treatment. Presented in 29th Annual Meeting and Exposition of Society for Biomaterials, Reno, Nevada, 2003.

73. Renner SM, Ochia R, Lorenz EP, **Lim TH**, Inoue N, Andersson GB, An HS: Axial passive rotation of human trunk for 3-D motion analysis of spinal column in vivo. Poster presented in 50th Annual Meeting of the Orthopaedic Research Society, San Francisco, CA, 2004.
74. Ochia RS, Inoue N, Renner S, Lorenz E, **Lim TH**, An H: Three-dimensional in vivo measurement of lumbar segmental motion under torsion. Poster presented in 51st Annual Meeting of the Orthopaedic Research Society, Washington D.C., 2005.
75. **Lim TH**, Ramakrishnan P, Kurriger G, J Martin, Stevens JA, Mendoza SA: Rat spinal motion segment in organ culture: a cell viability study. Presented in 51st Annual Meeting of the Orthopaedic Research Society, Washington D.C., 2005.
76. **Lim TH**, Han KS, Youn BD, Choi KK: Lumbar muscles can produce a follower load for enhancing the stability. Poster presented in 51st Annual Meeting of the Orthopaedic Research Society, Washington D.C., 2005.
77. **Lim TH***, Kim J, Yang SJ, Nakamura S, Sluka KA, Stevens JW, Mendoza SA, Park JB: The effect of abnormal shear force on intervertebral disc (IVD) degeneration and low back pain: in vivo rat study. Poster presented in 51st Annual Meeting of the Orthopaedic Research Society, Washington D.C., 2005.
78. Lee JW, **Lim TH**, Kornaga WM, Aurand G, Park JB: Intradiscal drug delivery system for the treatment of discogenic low back pain. Presented in the annual meeting and exhibition of the Society for Biomaterials, Memphis, TN, April, 2005.
79. Lee JW, **Lim TH**, Kornaga WM, Park JB: Development of nucleoplasty by in-situ forming hydrogels.. Poster presented in the annual meeting and exhibition of the Society for Biomaterials, Memphis, TN, April, 2005.
80. **Lim TH**, Ramakrishnan PS, Kurriger G, Martin JA, Stevens JW: Viability of rat spinal motion segment in organ culture – a cellular approach. Presented in 32nd Annual Meeting of the International Society for the Studies of the Lumbar Spine, May 10-14, 2005, New York City, NY.
81. **Lim TH**, Kim JH, SJ Yang, Park JB: An abnormal shear force application on the lumbar vertebra caused disc degeneration and pain behavior in rat. Won the **best poster award** in 32nd Annual Meeting of the International Society for the Studies of the Lumbar Spine, May 10-14, 2005, New York City, NY.
82. **Lim TH**, Youn BD, Han KS, Choi KK: Roles of back muscles in stabilizing the lumbar spine via a follower load mechanism. Poster presented in 32nd Annual Meeting of the International Society for the Studies of the Lumbar Spine, May 10-14, 2005, New York City, NY.
83. **Lim TH**, Han KS, Youn BD, Yang SJ, Choi KK: Maximum muscle force capacity affects the compressive follower load in the lumbar spine in quiet standing posture. Poster presented in 52nd Annual Meeting of the Orthopaedic Research Society, Chicago, 2006.
84. **Lim TH**, Lee JW, Lee SY, Park JB: Novel method for treatment of discogenic low back pain using percutaneously injectable in-situ forming hydrogel. Poster presented in 52nd Annual Meeting of the Orthopaedic Research Society, Chicago, 2006.
85. Han KS, **Lim TH**: Roles of back muscles in stabilization of the lumbar spine. Podium presented in the annual meeting of Biomedical Engineering Society, Chicago, 2006.
86. Kim J, Kim HC, Choi JH, Park JB, **Lim TH**: A shear force application on the lumbar vertebra caused disc degeneration and pain behavior in rat. Poster presented in the annual meeting of Biomedical Engineering Society, Chicago, 2006.
87. **Lim TH**, Lee JW, Park JB: A novel method for long-term relief of discogenic low back pain. Poster presented in the annual meeting of Biomedical Engineering Society, Chicago, 2006.
88. Ramakrishnan P, Zheng H, Martin JA, **Lim TH**, Kurriger GL, Buckwalter JA: A novel hydrogel for stem cell delivery to osteochondral defects. Poster presented in the 53rd Annual Meeting of Orthopaedic Research Society, San Diego, CA, Feb 11 – 14, 2007.
89. Ramakrishnan P, **Lim TH**, Martin JA, Kurriger GL: Biomechanical culture system: Feasibility study using rat intervertebral discs. Poster presented in the 53rd Annual Meeting of Orthopaedic Research Society, , San Diego, CA, Feb 11 – 14, 2007.