

## CURRICULUM VITAE

### Hyun W. Bae, MD

1301 20<sup>th</sup> St., Suite 400  
Santa Monica, CA 90404  
Email: hbae@espineinstitute.com  
(310) 828-7757

#### PERSONAL DATA:

Date of Birth: October 6, 1968  
Marital Status: Married, 02 May, 2001 Caroline M. Shim, M.D.

#### EDUCATION:

1990 B.S. Bioengineering and Biomechanics  
Columbia University, New York, NY  
1995 Doctor of Medicine, (*Cum laude*, May 1995)  
Yale University School Medicine, New Haven, CT

#### POST GRADUATE TRAINING:

1993-1994 Molecular and Cell Biology  
NIH Howard Hughes Research Fellow  
Bethesda, MD  
July, 1995- June, 1996 General Surgery Internship  
Northshore University Hospital, Manhasset, NY  
July, 1996-June, 2000 Orthopedic Surgery Residency  
Hospital for Special Surgery, New York, NY  
July, 2000- June, 2001 Spine Surgery Fellowship  
Case Western Reserve University, Cleveland, OH

#### HONORS:

1. *Senior Class President, Columbia University School of Engineering, 1989-1990*
2. *Class Speaker, Graduation Ceremonies, Columbia University School of Engineering, May 1990*
3. *National Osteoporosis Foundation Fellowship, 1992*
4. *Class President, Yale School of Medicine, 1991-1992, 1992-1993*
5. *Farr Scholar Award for Superior Performance as a Medical Student, Leadership, Integrity and Intellectual Honesty in the Pursuit of Medical Knowledge at Yale, 1992, 1993*
6. *Howard Hughes Research Scholar Fellowship, National Institutes of Health, Bethesda MD, 1993-1994*
7. *Cum laude and Alpha Omega Alpha, Yale School of Medicine, 1995*

8. *Eastern Orthopaedic Association Resident Research Award, San Juan, PR, 1998.*  
“Effect of Preoperative Donation of Autologous Blood on Deep Venous Thromboembolism in Total Hip Arthroplasty,” San Juan, PR, 1998
9. *DePuy AcroMed Named Research Grant, 2002*
10. *Cervical Spine Research Society, Basic Science Grant Award, 2003*
11. *Outstanding Poster Award, Scoliosis Research Society, 2004*
12. *Outstanding Paper Award, Spine Arthroplasty Society, 2005*

**RESEARCH EXPERIENCE:**

- 7/00-7/01** Case Western Reserve, Orthopedic Research Laboratory  
*Spine Fellowship, Director Dr. Brian Johnstone*  
Investigated the effects of bisphosphonates and statins on spinal fusion in a rabbit posterolateral spine fusion model.
- 9/93-7/94** Howard Hughes Research Scholar, Preceptor Dr. Michael B. Sporn  
National Cancer Institute, National Institutes of Health, Bethesda, MD  
  
Investigated the multifunctional effects of Transforming Growth Factor Beta (TGF- $\beta$ ) and its receptors using molecular biological techniques, including gene targeting, DNA sequencing, PCR amplification, DNA and RNA isolation, protein assays. Created a functional knockout of the TGF- $\beta$  receptors and examined TGF- $\beta$ 's anti-tumor effects on human osteosarcoma, human gastric and lung cancer cell lines.
- 9/92-3/93:** National Osteoporosis Foundation Scholarship, Director Dr. Roland Baron  
Bone Cell Biology Laboratory, Yale School of Medicine, New Haven, CT  
Investigated the chick calcitonin receptor
- 9/88-6/90** Research Assistant, Director Dr. Van C. Mow  
Orthopaedic Research Laboratory, Columbia University, New York, NY  
Designed an indentation machine to test the material properties of articular cartilage using AutoCad, a computer-aided design system.

**ASSOCIATIONS AND SCHOLARLY SOCIETY MEMBERSHIPS:**

American Academy of Orthopaedic Surgeons  
North American Spine Society  
American Board of Orthopaedic Surgery

**PUBLICATIONS**

1. Park K-C, **Bae H**, Sporn MB, Roberts AB and Kim S-J: The E1A Oncogene Induces Resistance to the Effects of 1,25-dihydroxyvitamin D3 on Inhibition of Growth of Mouse Keratinocytes. *Cancer Research, December 1, 1994.*
2. **Bae HW**, Geiser AG, Kim DH, Chung MT, Burmester JK, Sporn MB, Roberts AB, Kim SJ: Characterization of the promoter region of the human transforming growth factor-beta type II receptor gene. *J Biol Chem. 1995 Dec 8; 270(49):29460-8.*
3. **Bae H**, Widmann RF, Hotchkiss RN: Extreme rotational malunion of the humerus.: *J Bone Joint Surg Am. 2001 Mar;83-A(3):424-7.*
4. **Bae H**, Westrich GH, Sculco TP, Salvati EA: Effect of Preoperative Donation of Autologous Blood on Deep Venous Thromboembolism in Total Hip Arthroplasty," *The British Journal of Bone and Joint Surgery, July 2001*
5. **Bae H**, Delamarter R: Neurologic Recovery after Thoracolumbar Burst Fractures, *Orthopaedic Clinics of America, June 2002*
6. Davis TT, Sra P, Fuller N, **Bae H** : .Lumbar intervertebral thermal therapies. *Orthop Clin North Am. 2003 Apr;34(2):255-62.*
7. Delamarter RB, Fribourg DM, Kanim LE, **Bae H**: ProDisc Artificial Total Lumbar Disc Replacement: Introduction and Early Results From the United States Clinical Trial. *Spine. 2003 Oct 15; 28(20):S167-75.*
8. Yee AJ, **Bae HW**, Friess D, Robbin M, Johnstone B, Yoo JU: Augmentation of Rabbit Posterolateral Spondylodesis Using a Novel Demineralized Bone Matrix-Hyaluronan Putty. *Spine. 2003 Nov 1;28(21):2435-40*
9. Davis TT, Sra P, Fuller N, **Bae H**. Lumbar Intervertebral Thermal Therapies. *Orthopedic Clinics of North America. 2003 Apr;34(2):255-62, vi. Review.*
10. Yee AJ, **Bae HW**, Freiss D, Robbin M, Johnstone B, Yoo JU. Accuracy and Interobserver Agreement for Determinations of Rabbit Posterolateral Spinal Fusion. *Spine. 2004 Jun 15;29(12):1308-13.*
11. Fribourg D, Tang C, Sra P, Delamarter R, **Bae H**. Incidence of Subsequent Vertebral Fracture after Kyphoplasty. *Spine. 2004 Oct 15;29(20):2270-6.*
12. Delamarter RB, **Bae HW**, Pradhan BB. Clinical Results of ProDisc-II Lumbar Total Disc Replacement: Report from the United States Clinical Trial. *Orthopedic Clinics of North America.2005 Jul;36(3):301-13*
13. Pradhan BB, Delamarter RB, Patel VV, Kropf MA, **Bae HW**: Kyphoplasty Reduction of Osteoporotic Vertebral Compression Fractures: Correction of Local Kyphotic Deformity versus Overall Sagittal Alignment. *Accepted for publication Feb. 2005; Spine.*

14. **Bae HW**, Kanim L, Zhao L., Delamarter RB: Intra and Intervertebral Variability of BMP Concentration in Demineralized Bone Matrices. *Accepted for publication July 2005; Spine*.
15. Patel V., Zhao L., Pradhan BB., Delamarter RB., **Bae H**: Fibrin Glue Modulates BMP Stimulated Osteoinduction in Posterolateral Fusion in a Rat Model. *Accepted for publication Aug. 2005; Spine*.

#### **CHAPTERS IN BOOKS:**

1. **Bae H**, Fribourg D, Delmarter RB. Decompression for lumbar spinal stenosis. *The Adult Spine: Principles and Practice*, 3<sup>rd</sup> ed. Editor John Frymoyer. Lippincott-Raven, 2003 (in press).
2. **Bae H**, Delmarter RB: Cervical Vertebroectomy and Plating. *Master Techniques in Spinal Surgery*. Editor David Bradford, M.D., Lippincott-Raven, 2003 (in press).

#### **PRESENTATIONS AT PROFESSIONAL MEETINGS**

1. **Bae H**, Yee A, Freiss D, Robbins M, Johnstone B, Yoo J: Alendronate influences bone volume in rabbit posterolateral spine fusion. *International Society for the Study of the Lumbar Spine Annual Meeting, Cleveland, OH 2002*.
2. **Bae H**, Roh J, Yee A, Yoo J. Longitudinal Study of Cervical Canal Dimensions in Normal and Patients with Cervical Stenosis. *American Academy of Orthopedic Surgeons, Dallas, TX 2002; Cervical Spine Research Society, Monterey, CA 2002*.
3. Yee A, **Bae H**, Friess D, Robbin M, Johnstone B, Yoo J. Augmentation of spinal fusion with a demineralized bone/hyaluronan matrix. *International Society for the Study of the Lumbar Spine, Cleveland, OH 2002*
4. **Bae H**, Yee A, Freiss D, Yoo J, Johnston B: Alendronate Influences Bone Volume in Rabbit Posterolateral Spine Fusion. *North American Spine Society, Montreal, PQ, CA 2002*.
5. Tang C, Fribourg D, **Bae H**, Delamarter RB: Adjacent Fracture after Kyphoplasty. *Fellows Conference, New Orleans, LA 2002*.
6. **Hyun W. Bae, MD**, Rick B. Delamarter, MD, Lea Kanim: Effectiveness of Treatment with Bone Morphogenetic Proteins (BMP) in Recovery of Function Following Experimental Spinal Cord Injury in Rats. *Cervical Spine Research Society, Miami, FL 2002*.
7. **Bae H**, Zhao L, Kanim L, Wong P, Dawson E, Delamarter R: Transfected fibroblasts producing BMP-2 induce posterolateral fusion in a rat. *International Society for the Study of the Lumbar Spine, Vancouver, BC, CA 2003*.
8. **Bae H**, Zhao L, Kanim L, Wong P, Dawson E, Delamarter R: Inter and intravariability of BMPs in commercially available demineralized bone matrices. *International Society for the Study of the Lumbar Spine, Vancouver, BC, CA 2003*.

9. Tang C, Fribourg D, Rudin B, **Bae H**, Delamarter R: Evaluation of fracture recurrence after kyphoplasty with cement augmentation in vertebral insufficiency fractures. *International Society for the Study of the Lumbar Spine, Vancouver, BC, CA 2003.*
10. Delamarter RB, **Bae HW**. Cervical plates and why they fail. *Spine Across the Sea, Maui, HI 2003.*
11. **Bae HW**, Zhao L, Kanim LEA, Delamarter RB. Transfected fibroblasts producing BMP-2 induce posterolateral fusion in a rat. *Spine Across the Sea, Maui, HI 2003.*
12. **Bae HW**, Zhao L, Kanim LEA, Wong P, Dawson EG, Delamarter RB. Inter and intravariability of BMPs in commercially available demineralized bone matrices. *Spine Across the Sea, Maui, HI 2003.*
13. Fribourg D, Tang C, Delamarter R, **Bae H**: Incidence of Subsequent Vertebral Fracture After Kyphoplasty. *Spine Across the Sea, Maui, HI 2003.*
14. **Bae H**, Yee A, Freiss D, Yoo J, Johnston B: Alendronate Influences Bone Volume in Rabbit Posterolateral Spine Fusion. *World Spine II, Chicago, IL, August 2003.*
15. **Bae HW**, Zhao L, Kanim LEA, Wong P, Delamarter RB. Transfected fibroblasts producing BMP-2 induce posterolateral fusion in a rat. *World Spine II, Chicago, IL, August 2003.*
16. Delamarter R, Kanim L, **Bae H**, Hannani K, Zhao L, Gilbert T, Jensen L, Springer S, Dawson J, Griffith S: Successful Fusion With Posterior Fixation Systems of Differing Biomechanical Rigidity Demonstrated in an In Vivo Animal Model. *North American Spine Society, San Diego, CA 2003.*
17. Fribourg D, Tang C, Delamarter R, **Bae H**: Incidence of subsequent vertebral fracture after kyphoplasty. *North American Spine Society, San Diego, CA 2003.*
18. Tang C, Fribourg D, Sra P, **Bae H**, Delamarter R: Spine Range of Motion After Artificial Disc Replacement: Preliminary Report. *North American Spine Society, San Diego, CA 2003.*
19. Delamarter RB, **Bae HW**. Dynamic Anterior Cervical Plates and Why They Fail ? *North American Spine Society, San Diego, CA 2003.*
20. **Bae HW**, Zhao L, Kanim LEA, Dawson EG, Delamarter RB. Inter and intravariability of BMPs in commercially available demineralized bone matrices. *North American Spine Society, San Diego, CA 2003.*
21. **Bae HW**, Kanim LEA, Sra P, Delamarter RB, Kropf MA. Disc replacement versus fusion: Comparison of patient self-assessments. *North American Spine Society, San Diego, CA 2003.*
22. **Bae H**, Delamarter RB: Dynamic cervical plates and why they fail. *Western Orthopaedic Association, San Antonio, TX, October, 2003.*
23. **Bae HW**, Kanim LEA, Sra P, Delamarter RB, Kropf MA. Disc replacement versus fusion: Comparison of patient self-assessments. *Western Orthopaedic Association, San Antonio, TX, October, 2003.*
24. **Bae HW**, Zhao L, Kanim L, Dawson EG, Delamarter RB: Inter and Intravariability of BMPs in Commercially Available Demineralized Bone Matrices. *Western Orthopaedic Association, San Antonio, TX, October, 2003.*

25. **Bae H**, Zhao L, Kanim L, Wong P, Dawson EG, Delamarter RB: Transfected fibroblasts producing BMP-2 induce posterolateral fusion in a rat. *Western Orthopaedic Association, San Antonio, TX, October, 2003.*
26. **Bae HW**, Zhao L, Kanim L, Dawson EG, Delamarter RB: Inter and Intra-variability of BMPs in Commercially Available Demineralized Bone Matrices. *Cervical Spine Research Society, Scottsdale, AZ December 2003.*
27. **Bae H**, Zhao L, Kanim L, Wong P, Dawson EG, Delamarter RB: Transfected fibroblasts producing BMP-2 induce posterolateral fusion in a rat. *Cervical Spine Research Society, Scottsdale, AZ December 2003.*
28. **Bae H**, Kanim L, Zhao L, Delamarter RB: Effectiveness of treatment with bone morphogenetic proteins (BMPs) in Recovery of Function Following Experimental Spinal Cord Injury in Rats. *Cervical Spine Research Society, Scottsdale, AZ December 2003.*
29. Patel, V. Xiao L., Pradhan, B, **Bae, H.**, Delamarter, R: Controlling BMP-stimulated Bone Growth using Fibrin Glue. *Proceedings of the 11<sup>th</sup> International Meeting on Advanced Spine Techniques, July 1-3, Southhampton, Bermuda*
30. Patel, V. Andrews, C. Kanim, L. Pradhan, B, Kropf, M., **Bae, H**, Delamarter, R.: Computed Tomography Evaluation of Intervertebral Prosthesis. *Proceedings of the 11<sup>th</sup> International Meeting on Advanced Spine Techniques, July 1-3, Southhampton, Bermuda*
31. Patel, V, Pradhan, B, **Bae, H**, Delamarter, R.: Cervical Spine Motion After Disc Replacement. *Proceedings of the 11<sup>th</sup> International Meeting on Advanced Spine Techniques, July 1-3, Southhampton, Bermuda*
32. Vikas V. Patel, MD, Li Xiao, P. Wong, B. Pradhan, MD, **H. Bae, MD**, R. Delamarter, MD: BMP Diffusion Through Surgical Adhesives. *Western Orthopaedic Association, San Francisco, CA, September-October 2004.*
33. Vikas V. Patel, MD, C. Andrews, MD, **H. Bae, MD**, L. Kanim, MA, B. Pradhan, MD, R. Delamarter, MD: Computed Tomography Evaluation Of Intervertebral Prosthesis. *Western Orthopaedic Association, San Francisco, CA, September-October, 2004.*
34. **H. Bae, MD**, M. Kropf, MD, B. Pradhan, MD, R. Delamarter, MD: Cervical Spine Motion After Disc Replacement. *Western Orthopaedic Association, San Francisco, CA, September-October 2004.*
35. **Hyun Bae, MD**, Phillip Maurer, Ray Linovitz, Erik Westerlund, Tim Peppers: A Prospective Multi-Center Pilot Study On The Use Of Cortoss In Vertebroplasty; Report On The First 20 Cases. *Western Orthopaedic Association, San Francisco, CA, September-October 2004.*
36. Vikas V. Patel, MD, Li Zhao, Pamela Wong, Ben Bhupendra Pradhan, MD, Linda Kanim, MA, **Hyun W. Bae, MD**, Rick B. Delamarter, MD: Controlling BMP-Simulated Bone Growth Using Fibrin Glue. *Scoliosis Research Society, Buenos Aires, Argentina, September 2004.*

37. **Bae H**, Zhao L, Kanim L, Wong P, Delamarter R, Dawson EG, Kropf MA: Inter and Intravariability of BMP's in Commercially Available Demineralized Bone Matrix Products. *Scoliosis Research Society Annual Meeting, Buenos Aires, Argentina, September 2004.*
38. Pradhan, BB, Delamarter RB, Patel VV, Kropf MA, **Bae HW**: Kyphoplasty for Osteoporotic Vertebral Compression Fractures-Correction of Local Kyphotic Deformity versus Overall Sagittal Alignment. *Scoliosis Research Society Annual Meeting, Buenos Aires, Argentina September, 2004.*
39. Pradhan BB, Delamarter RB, Patel VV, Kropf, MA, **Bae HW**, Dawson EG: Can rhBMP-2 Enhance Fusion in Anterior Lumbar Interbody Fusion with Stand-Alone Femoral Ring Allografts? *North American Spine Society Annual Meeting, Chicago, IL, November 2004.*
40. Pradhan BB, **Bae HW**, Kanim L, Lam L, Kropf MA, Kamrava E, Delamarter RB: Effect of Disc Height Restoration on Range of Motion and Clinical Outcome After Semi-constrained Lumbar Total Disc Replacement (ProDisc-II) *Spine Arthroplasty Society Annual Symposium on Motion Preservation Technology, New York, NY, May 2005*
41. Delamarter RB, **Bae HW**, Kamrava E, Lam L, Kanim L, Pradhan BB: Cervical Disc Replacement-Intermediate-Term Follow-up (1 to 2 years) of Range of Motion and Clinical Outcomes with the ProDisc-C Prosthesis. *Spine Arthroplasty Society Annual Symposium on Motion Preservation Technology, New York, NY, May 2005*
42. Pradhan BB, **Bae HW**, Kanim L, Lam L, Kamrava E, Delamarter RB: Restoration and Maintenance of Coronal and Sagittal Lumbar Spinal Alignment with a Semi-Constrained Multi-level Lumbar Total Disc Arthroplasty (ProDisc-II). *Spine Arthroplasty Society Annual Symposium on Motion Preservation Technology, New York, NY, May 2005*
43. **Bae HW**, Pradhan BB, Kanim L, Lam L, Kamrava E, Delamarter RB: Lumbar Total Disc Replacement: A 2 to 3 Year Report From the United States Clinical Trial for the ProDisc-II Prosthesis. *World Spine III, Rio De Janeiro, Brazil, August 2005*
44. Pradhan BB, Rudin B, **Bae HW**, Kanim L, Kamrava E, Patel VV, Delamarter RB: Artificial Disc Replacement as a Salvage Treatment for Failed Back Syndrome. *World Spine III, Rio De Janeiro, Brazil, August 2005*
45. Patel VV, Andrews C, **Bae HW**, Kanim L, Pradhan BB, Delamarter RB: Computed Tomography Evaluation of Positioning of Artificial Discs, Along With its Radiographic and Clinical Relevance. *World Spine III, Rio De Janeiro, Brazil, August 2005*
46. Patel VV, Xao L, Wong P, Pradhan B, **Bae HW**, Delamarter RB: Controlling Bone Morphogenetic Protein Stimulated Bone Growth with Fibrin Glue (a Biologic Sealant). *World Spine III, Rio De Janeiro, Brazil, August 2005*
47. **Bae HW**, Zhao L, Kanim L, Wong P, Sra P, Pradhan B, Delamarter R: Recovery of Function Following Experimental Lumbar Spinal Cord Injury in Rats: Effectiveness of Treatment with rhBMP-2, rhBMP-7 and rhBDNF. *World Spine III, Rio De Janeiro, Brazil, August 2005*



48. Patel V, Hsu S, **Bae HW**, Pradhan BB, Hedman T, Delamarter: Biomechanical Evaluation of Floating and Fixed Center of Rotation Total Disc Replacements. *World Spine III, Rio De Janeiro, Brazil, August 2005*
49. **HW Bae MD**, L Lam MPH, P Wong BS, BB Pradhan MD MSE, M Kropf MD, RB Delamarter MD: Comparison Of Outcomes In Workers Compensation Versus Non-Compensation Patients After Artificial Disc Replacement Surgery. *World Spine III, Rio De Janeiro, Brazil, Aug 2005.*
50. Ben B Pradhan, MD MSE, **Hyun W Bae, MD**, Vikas V Patel, MD MA, Linda EA Kanim, MA, Michael A Kropf, MD, Rick B Delamarter, MD: ProDisc-C Artificial Total Cervical Disc Replacement: Twelve to Eighteen Month Results from the United States Clinical Trial. *World Spine III, Rio De Janeiro, Brazil, Aug 2005.*
51. Huffman, J, **Bae HW**, Pradhan B, Kanim L, Lam L, Rudin B, Delamarter, R: Dynamic Posterior Stabilization of the Lumbar Spine: Early Results from the US Clinical Trial with the Dynesys System. *World Spine III, Rio De Janeiro, Brazil Aug 2005*
52. Pradhan B, **Bae HW**, Kropf M, Patel V, Zhao L, Wong P, Delamarter R: Leakage of rhBMP-2 from absorbable collagen sponges during ACDF: quantification and follow-up with radiographic analysis. *World Spine III, Rio De Janeiro, Brazil Aug 2005*
53. Pradhan B, **Bae HW**, Kropf M, Delamarter R: Graft resorption with rhBMP-2 in ACDF: a radiographic characterization of the effect of BMP on structural allografts. *Western Orthopedic Association Annual Meeting, Waikoloa, HI, Jul 2005*
54. **Bae HW**, Zhao L, Kanim L, Wong P, Sra P, Pradhan B, Delamarter R: Recovery of Function Following Experimental Lumbar Spinal Cord Injury in Rats: Effectiveness of Treatment with rhBMP-2, rhBMP-7, and rhBDNF. *Western Orthopedic Association Annual Meeting, Waikoloa, HI 2005*
55. Pradhan B, **Bae H**, Pradhan B, Kanim L, Lam L, Rudin B, Delamarter R: Graft Resorption with rhBMP-2 in ACDF: a radiographic characterization of the effect of BMP on structural allografts. *Western Orthopedic Association Annual Meeting, Waikoloa, HI 2005*
56. Huffman, J, **Bae HW**, Pradhan B, Kanim L, Lam L, Rudin B, Delamarter, R: Dynamic Posterior Stabilization of the Lumbar Spine: Early Results from the US Clinical Trial with the Dynesys System. *Western Orthopedic Association Annual Meeting, Waikoloa, HI 2005*
57. Delamarter R, Lam L, Pradhan B, **Bae HW**: Comparison Of Outcomes In Worker's Compensation Versus Non-Compensation Patients After Lumbar Artificial Disc Replacement Surgery: *Western Orthopedic Association Annual Meeting, Waikoloa, HI 2005*
58. Pradhan B, **Bae HW**, Kropf MA, Patel V, Zhao L, Wong P, Delamarter R: Leakage of BMP from absorbable collagen sponges during ACDF: quantification and CT analysis for ectopic bone formation in canal. *Western Orthopedics Association Annual Meeting, Waikoloa, HI 2005*

59. Pradhan B, Rudin B, **Bae HW**, Kanim L, Patel V, Kamrava E, Delamarter R: Artificial Disc Replacement as a Salvage Treatment for Failed Back Syndrome. *Western Orthopedic Association Annual Meeting, Waikoloa, HI 2005*
60. Pradhan B, **Bae HW**, Kanim L, Lam L, Kropf M, Kamrava E, Delamarter R: Disc Height Restoration and its Effect on Range of Motion and Clinical Outcome after Semi-Constrained Total Disc Replacement (ProDisc-II). *Western Orthopedic Association Annual Meeting, Waikoloa, HI 2005*
61. **Bae HW**, Kanim L, Zhao L, Wong P, Pradhan B, Delamarter R: Cellular Environments Can Alter Performance of rhBMP-2 and Induce Pseudoarthrosis. *Western Orthopedic Association Annual Meeting, Waikoloa, HI 2005*
62. **Bae HW**, Pradhan B, Kanim L, Lam L, Kamrava E, Delamarter, R: Lumbar Total Disc Replacement: A 2 To 3 Year Report From the United States Clinical Trial for the ProDisc-II Prosthesis. *Western Orthopedic Association Annual Meeting, Waikoloa, HI 2005*
63. Pradhan B, Rudin B, **Bae HW**, Kanim L, Patel V, Kamrava E, Delamarter R: Artificial Disc Replacement as a Salvage Treatment for Failed Back Syndrome. *International Society for Surgery of the Lumbar Spine, New York, NY, May 2005*
64. **Bae HW**, Pradhan B, Kanim L, Lam L, Kamrava E, Delamarter, R: Lumbar Total Disc Replacement: A 2 To 3 Year Report From the United States Clinical Trial for the ProDisc-II Prosthesis. *International Society for Surgery of the Lumbar Spine, New York, NY May 2005*
65. **Bae HW**, Zhao L, Kanim L, Wong P, Sra P, Pradhan B, Delamarter R: Recovery of Function Following Experimental Lumbar Spinal Cord Injury in Rats: Effectiveness of Treatment with rhBMP-2, rhBMP-7, and rhBDNF. *International Society for Surgery of the Lumbar Spine, New York, NY, May 2005*
66. Patel VV, Xiao L, Wong P, Pradhan B, **Bae HW**, Delamarter RB: Controlling Bone Morphogenetic Protein Stimulated Bone Growth with Fibrin Glue (a Biologic Sealant). *International Society for Surgery of the Lumbar Spine, New York, NY, May 2005*
67. Delamarter R, Lam L, Pradhan B, **Bae HW**: Comparison Of Outcomes In Worker's Compensation Versus Non-Compensation Patients After Lumbar Artificial Disc Replacement Surgery. *International Society for Surgery of the Lumbar Spine, New York, NY, May 2005.*
68. Patel V, Andrews C, Kanim L, Pradhan B, Kropf M, **Bae HW**, Delamarter R. Post-op and Follow up CT Evaluation of Artificial Disc Replacement: Excellent Outcomes Even with Positional Deviation. *International Society for Surgery of the Lumbar Spine, New York, NY, May 2005.*

69. Patel V, Zhao L, Wong P, Pradhan B, **Bae HW**, Delamarter, R. Controlling Bone Morphogenetic Protein-Stimulated Bone Growth. *International Society for Surgery of the Lumbar Spine, New York, NY, May 2005.*
70. Patel VV, Andrews C, **Bae HW**, Kanim L, Pradhan BB, Delamarter RB: Computed Tomography Evaluation of Positioning of Artificial Discs, Along With its Radiographic and Clinical Relevance. *International Society for Surgery of the Lumbar Spine, New York, NY, May 2005.*
71. Patel V, Hsu S, **Bae HW**, Pradhan B, Hedman T, Delamarter R. Biomechanical Evaluation of Floating (Charite) Versus Fixed Center of Rotation (ProDisc) Total Disc Replacements. *International Society for Surgery of the Lumbar Spine, New York, NY, May 2005.*
72. Pradhan BB, **Bae HW**, Kanim L, Lam L, Rudin B, Delamarter R. Disc Height Restoration and Its Effects on Range of Motion and Clinical Outcome After Semi-Constrained Total Disc Replacement (ProDisc-II). *International Society for Surgery of the Lumbar Spine, New York, NY, May 2005.*
73. Huffman, J, **Bae HW**, Pradhan B, Kanim L, Lam L, Rudin B, Delamarter, R: Dynamic Posterior Stabilization of the Lumbar Spine: Early Results from the US Clinical Trial with the Dynesys System. *International Society for Surgery of the Lumbar Spine, New York, NY, May 2005.*
74. Pradhan BB, **Bae HW**, Kanim L, Kamrava E, Delamarter R. Restoration and Maintenance of Coronal and Sagittal Spinal Alignment with a Semi-Constrained Multi-Level Total Disc Arthroplasty (ProDisc-II). *International Society for Surgery of the Lumbar Spine, New York, NY, May 2005.*
75. Pradhan BB, **Bae HW**, Kropf MA, Patel VV, Zhao L, Wong P, Delamarter R. Leakage of rhBMP-2 from Absorbable Collagen Sponges during use in Anterior Cervical Discectomy and Fusion: Quantification by Assay and Radiographic Follow-up. *American Association of Neurological Surgeons/Congress of Neurological Surgeons Section on Disorders of the Spine and Peripheral Nerves Annual Meeting, Phoenix, AZ, March 2005.*
76. Pradhan BB, **Bae HW**, Kropf MA, Patel VV, Delamarter RB. Resorption of Grafts and Vertebral Endplates in Anterior Cervical Discectomy and Fusion using rhBMP-2- Implications on Fusion. *American Association of Neurological Surgeons/Congress of Neurological Surgeons Section on Disorders of the Spine and Peripheral Nerves Annual Meeting, Phoenix, AZ, March 2005.*
77. Pradhan BB, **Bae HW**, Delamarter RB, Patel VV, Dawson EG. Increased Risk for Nonunion in Anterior Lumbar Interbody Fusion with Stand-Alone Femoral Ring Allografts when using rhBMP-2. *American Association of Neurological Surgeons/Congress of Neurological Surgeons Section on Disorders of the Spine and Peripheral Nerves Annual Meeting, Phoenix, AZ, March 2005.*

78. Pradhan B, **Bae H**, Patel V, Kanim L, Kropf M, Delamarter R. ProDisc-C Artificial Total Cervical Disc Replacement: Twelve to Eighteen Month Results from the United States Clinical Trial. *American Association of Neurological Surgeons/Congress of Neurological Surgeons Section on Disorders of the Spine and Peripheral Nerves Annual Meeting, Phoenix, AZ, March 2005.*
79. Pradhan BB, **Bae HW**, Kanim L, Delamarter R. ProDisc-II Artificial Total Lumbar Disc Replacement: Two to Three Year Results from the United States Clinical Trial. *American Association of Neurological Surgeons/Congress of Neurological Surgeons Section on Disorders of the Spine and Peripheral Nerves Annual Meeting, Phoenix, AZ, March 2005.*
80. Patel V, Zhou L, Wong P, Pradhan B, **Bae HW**, Delamarter R. BMP Modulation Using Fibrin Glue in Spinal Fusion. *American Association of Neurological Surgeons/Congress of Neurological Surgeons Section on Disorders of the Spine and Peripheral Nerves Annual Meeting, Phoenix, AZ, March 2005.*
81. Pradhan B, Delamarter R, Patel V, Kropf M, **Bae HW**, Dawson EG. Can rhBMP-2 Enhance Fusion in Anterior Lumbar Interbody Fusion with Stand-Alone Femoral Ring Allografts? *Orthopaedic Research Society Annual Meeting, Washington DC, Feb. 2005.*
82. Pradhan BB, Delamarter RB, Patel VV, Kropf MA, **Bae HW**. Kyphoplasty Reduction of Vertebral Compression Fractures-Correction of Local Deformity Versus Overall Sagittal Alignment. *Orthopaedic Research Society Annual Meeting, Washington DC, Feb. 2005.*
83. Pradhan BB, **Bae HW**, Kropf MA, Patel VV, Zhao L, Wong P, Delamarter R. Leakage of rhBMP-2 from Absorbable Collagen Sponges during use in Anterior Cervical Discectomy and Fusion: Quantification by Assay and Radiographic Follow-up. *Orthopaedic Research Society Annual Meeting, Washington DC, Feb. 2005.*

## **PUBLICATIONS IN PREPARATION**

1. **Bae H**, Kanim L, Sra P, Kropf M, Delamarter R. Prodisc Artificial Disc: Results of motion and outcomes relationship one year after artificial disc replacement (in preparation, Spine)
2. Pradhan BB, **Bae HW**, Patel VV, Kropf MA, Zhao L, Wong P, Delamarter RB: Leakage of rhBMP-2 from Absorbable Collagen Sponges during use in Anterior Cervical Discectomy and Fusion: Quantification by Assay and Radiographic Follow-up. Submitted for publication, Spine.
3. Pradhan BB, **Bae HW**, Kropf MA, Patel VV, Delamarter RB: Radiographic Characterization of Anterior Cervical Discectomy and Fusion using Allograft, rhBMP-2, and Plate. Submitted for publication, Spine.
4. Pradhan BB, Delamarter RB, **Bae HW**, Patel VV, Kropf MA, Dawson EG: Can rhBMP-2 Enhance Fusion in Anterior Lumbar Interbody Fusion with Stand-Alone Femoral Ring Allografts? (presented at meetings, submitted for publication, Spine.)
5. Pradhan BB, Patel VV, **Bae HW**, Kropf MA, Delamarter RB: Lumbar Disc Degeneration in Women and Advances in Management-Total Disc Replacement. Submitted for publication, The Spine Journal.
6. Patel VV, Andrews C, Kanim L, Pradhan BB, Kropf MA, **Bae HW**, Delamarter RB: Intervertebral Prosthesis Position Evaluated by Computed Tomography-Relevance to Clinical Outcome. Submitted for publication, Spine.
7. Patel V, Hsu S., **Bae H**, Pradhan B, Hedman T, Delamarter R: Floating and Fixed Center of Rotation Intervertebral Prosthesis: Biomechanical Comparison. Submitted for publication, Spine
8. Patel V, Xiao li, Wong P, **Bae H**, Pradhan B, Delamarter R: Using Fibrin Glue to Protect the Spine from BMP-Stimulated Bone Formation. Submitted for publication, CORR.
9. Patel V, Andrews C, Kanim L, Pradhan B, Kropf M, **Bae H**, Delamarter R: Intervertebral Prosthesis Position Evaluated by Computed Tomography: Relevance to Clinical Outcome. Submitted for publication, Spine
10. Patel V, Pradhan B, **Bae H**, Delamarter R: Cervical Spine Motion After Disc Replacement. Submitted for Publication, Spine

## ON-GOING BASIC SCIENCE & PRECLINICAL RESEARCH

### Spinal Cord Injury—Tissue Engineering:

1. Bae HW, Zhao L, Kanim LEA, Wong P, Sra P, Delamarter RB. Intrathecal neurotrophic factors of BMPs after experimental cauda equina compression in the rat. *Phase IIa*. Bae HW, Zhao L, Kanim LEA, Wong P, Sra P, Delamarter RB. Intrathecal neurotrophic factors of BMPs compared to BDNF for functional recovery after experimental cauda equina compression in the rat. *Phase IIb*. Bae HW, Zhao L, Kanim LEA, Sra P, Delamarter RB. Intrathecal delivery of allograft fibroblasts carrying cDNAs for various BMPs for functional recovery after experimental cauda equina compression in the Rat. *Phase III*. Bae HW, Zhao L, Kanim LEA, Sra P, Delamarter RB. Intrathecal delivery of allograft fibroblasts carrying cDNAs for various BMPs for functional recovery after experimental cauda equina compression in the Rat. *Phase III*. Bae HW, Kanim LEA, Zhao L, Delamarter RB. Screening of bone morphogenetic proteins (BMP) in adult neuron cell cultures (in vitro, pig & rat cell lines *established*). Bae HW, Kanim LEA, Zhao L, Delamarter RB. Screening of bone morphogenetic proteins (BMP) in adult neuron cell cultures (in vitro, human cell lines *proposed*). Bae HW, Kanim LEA, Zhao L, Delamarter RB. Screening of allografted fibroblasts in adult neuron cell cultures (in vitro, human cell lines *proposed*).

### Intervertebral Disc—Tissue Engineering:

2. Bae HW, Zhao L, Kanim LEA, Dawson EG. Transduction of intervertebral disc cells via retroviral /adenoviral gene transfer factors inducing matrix vs. bone formation.
3. Bae HW, Kanim LEA, Sra P, Zhao L, Delamarter RB. Screening of bone morphogenetic proteins (BMP) and other members in TGF-B family in adult disc tissue cultures, annulus and nucleus (pig, rat). *Bone – Tissue Engineering:*
4. Bae HW, Kanim LEA, Zhao L. Mice fibroblasts infected with the cDNA-BMP-2: in vitro preparation with in-vivo evaluation for posterolateral intertransverse fusion.
5. Bae HW, Kanim LEA, Zhao L. Human fibroblasts infected with the cDNA-BMP-2: in vitro preparation with in-vivo evaluation for posterolateral intertransverse fusion.
6. Bae HW, Kanim LEA, Zhao L, Dawson EG, Delamarter RB. Evaluation of the interference effect of fibroblasts vs. surrounding muscle vitality for pseudarthrosis repair after posterolateral intertransverse process fusion: a rat model.

### Proposals for Research:

7. Bae HW, Kanim LEA, Sra P, Zhao L, Delamarter RB. Effectiveness of treatment with bone morphogenetic proteins (BMP) in recovery of function following experimental spinal cord injury in rats.
8. Hyun B, Kanim LEA, Delamarter RB: Evaluation of active BMPs remaining in demineralized bone matrix products in relationship to successful posterolateral intertransverse process fusion in athymic rat model. Submitted to Orthopaedic Research and Education Foundation, September 2003

9. Bae HW, Kanim LEA, Zhao L, Delamarter RB. Rat Fibroblasts infected with the cDNA-BMP-2: in vitro preparation with in-vivo evaluation for posterolateral intertransverse fusion.
10. Delamarter RB, Bae HW, Kropf MA, Dawson EG, Zhao L, Kanim LEA. Tissue Banking Project: residual tissues after spinal surgery for in vitro tissue culture, and analysis of the prospects for tissue engineering.
11. Delamarter RB, Bae HW, Kropf MA, Dawson EG, Zhao L, Kanim LEA. Characterization Nucleus pulposus cells after intervertebral disc degeneration (from the Tissue Banking Project: residual tissues after spinal surgery harvest for in vitro analysis, tissue culture and prospects for tissue engineering).
12. Kanim LEA Bae HW, Zhao L, Kropf MA, Delamarter RB, Dawson EG. Effect of rhBMP-2 /OP-1 (rhBMP-7) on human cortical 'local bone' graft on posterolateral fusion in the athymic rnu rnu rat model. (tissue harvested from the Tissue Banking Project: residual tissues after spinal surgery).