

Principal Investigator/Program Director (Last, First, Middle):

### BIOGRAPHICAL SKETCH

Provide the following information for the key personnel and other significant contributors in the order listed on Form Page 2.

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|   |  |   |         |                 |
|---|--|---|---------|-----------------|
| NAME<br>Gunnar B. J. Andersson, M.D., Ph.D.   |  | POSITION TITLE<br>Professor   |         |                 |
| eRA COMMONS USER NAME   |  | Department of Orthopedic Surgery<br>Rush University Medical Center, Chicago, IL |         |                 |
| EDUCATION/TRAINING ( <i>Begin with baccalaureate or other initial professional education, such as</i> |  |   |         |                 |
| INSTITUTION AND LOCATION  |  | DEGREE<br>( <i>if applicable</i> )  | YEAR(s) | FIELD OF STUDY  |
| University of Göteborg, Sweden  |  | M.D.  | 1969    | Medicine        |
| University of Göteborg, Sweden  |  | Ph.D.   | 1974    | Medical Science |

#### A. Positions and Honors

##### Professional Experience

2008 – Present The Ronald L. DeWald, M.D., Professor and Chairman Emeritus, Department of Orthopedic Surgery, Rush University Medical Center, Chicago, Illinois

1995 – 2008 The William A. Hark, M.D. - Susanne G. Swift Professor and Chairman, Department of Orthopedic Surgery, Rush University Medical Center, Chicago, Illinois

2002 – 2004 Senior Vice President, Medical Affairs

2000 – 2002 Vice Dean, Surgical Sciences and Services, Rush Medical College

1997 – Present Adjunct Professor, College of Engineering, Bioengineering, University of Illinois at Chicago

1985 – Present Professor, Department of Orthopedic Surgery, Rush Medical College, Chicago, Illinois

##### Awards and Honors (Selected)

1989 Muybridge Medal (Int. Soc. of Biomechanics)

1994 Hilker Award (Central States Occupational Med. Assoc.)

2002 The International Society for the Study of the Lumbar Spine (ISSLS) Stryker Spine Lifetime Achievement Award

1985 President, International Society of Electrophysiological Kiniesiology

1989 President, International Society for the Study of the Lumbar Spine

1990 – 1993 NIH Orthopaedic and Musculoskeletal Study Section

2000 President, Orthopaedic Research Society

2000 – 2004 NIH, Advisory Council NIAMS

2004 - 2005 President, American Academy of Disability Evaluating Physicians (AADEP)

#### B. Selected peer-reviewed publications (in chronological order). (Publications selected from 267)

1. Masuda K, Aota Y, Muehleman C, Imai Y, Okuma M, Thonar E J, **Andersson GB**, An H. A Novel Rabbit Model of Mild, Reproducible Disc Degeneration by an Annulus Needle Puncture: Correlation between the Degree of Disc Injury and Radiological and Histologic Appearances of Disc Degeneration. *Spine* 30:1; 5-14, 2005.

2. An HS, Takegami K, Kamada H, Nguyen CM, Thonar E J-MA, Singh K, **Andersson GB** and Masuda K. Intradiscal Administration of Osteogenic Protein-1 Increases Intervertebral Disc Height and Proteoglycan Content in the Nucleus Pulposus in Normal Adolescent Rabbits. *Spine* 30:25-32, 2005.
3. Aota Y, An HS, Homandberg G, Thonar E J-MA, **Andersson GBJ**, Pichika R, Masuda K. Differential Effects of Fibroectin Fragment on Proteoglycan Metabolism by Intervertebral Disc Cells: A Comparison With Articular Chondrocytis. *Spine* 30: 722-738, 2005.
4. Zhang Y, An HS, Toofanfard M, Li Z, **Andersson GBJ**, Thonar EJMA. Low-Dose Interleukin-1 Partially Counteracts Osteogenic Protein-1 – Induced Proteoglycan Synthesis by Adult Bovine Intervertebral Disk Cells. *Am J Phys Med Rehabil* 84: 322-239, 2005.
5. Loguidice V, Mahoney CB, Haldeman J, **Andersson GBJ**. Clinical experience with a pneumatic vest – unloading the spine in the upright posture. *J Musculoskeletal Research*, Vol. 9, No. 2 (2005) 65-69.
6. Singh K, An HS, Samartzis D, Nassr A, Provus J, Hickey M, **Andersson GBJ**. A prospective cohort analysis of adjacent vertebral body bone mineral density in lumbar surgery patients with or without instrumented posterolateral fusion: A 9- to 12- year follow-up. *Spine* 30:1750-1755, 2005.
7. Singh K, Samartzis, D, Vaccaro AR, Nassr A, **Andersson, GB**, Yoon ST, Phillips FM, Goldberg EJ, An HS. Congenital lumbar spinal stenosis: a prospective, control-matched, cohort radiographic analysis. *The Spine Journal* 5, 615-622, 2005.
8. **Andersson GBJ**, Burkus, JK, Foley, KT, Haid, RW, Nockels RP, Poly DW, Sonntag, VKH, Traynelis VC, Weinstein JN. Summary Statement: Treatment of Painful Motion Segment. *Spine* 30(16S): S1, 2005.
9. **Andersson GBJ**, An HS, Oegema TR, Jr., Setton LR. Intervertebral Disc Degeneration. *JBJS* 88A: 895-899, 2006
10. **Andersson GBJ**, An HS, Oegema TR, Jr., Setton LR. Introduction. *JBJS* 88A (Suppl.): 1-2, 2006
11. **Andersson GBJ**, An HS, Oegema TR, Jr., Setton LR. Directions for Future Research. *JBJS* 88A (Suppl.): 110-114, 2006.
12. Natarajan RN, Williams JR, **Andersson GBJ**. Modeling Changes in Intervertebral Disc Mechanics with Degeneration. *JBJS* 88A (Suppl.): 36-40, 2006.
13. Masuda K, Imai Y, Okuma M, Muehleman C, Nakagawa K, Akeda K, Thonar E, **Andersson G**, An HS. Osteogenic Protein-1 Injection into a Degenerated Disc Induces the Restoration of Disc Height and Structural Changes in the Rabbit Anular Puncture Model. *Spine* 31: 742-754, 2006.
14. Oleske DM, Lavender SA, **Andersson GBJ**, Morrissey MJ et al. Risk Factors for Recurrent Episodes of Work-Related Low Back Disorders in an Industrial Population. *Spine* 31: 789-798, 2006.
15. Shen Francis H, Samartzis D, **Andersson GBJ**. Nonsurgical Management of Acute and Chronic Low Back Pain. *J Am Acad Orthop Surg* 14:477-487, September 2006.
16. **Andersson GBJ**, Nagy AM, Block JE. Treatment of Intractable Discogenic Low Back Pain. A Systematic Review of Spinal Fusion and Intradiscal Electrothermal Therapy (IDET). *Pain Physician*. 2006; 9; 237-248, ISSN 15633-3159.
17. Ochia RS, Inoue N, Renner SM, Lorenz EP, Lim T-H, **Andersson GBJ**, An HS. Three-Dimensional *In Vivo* Measurement of Lumbar Spine Segmental Motion. *Spine* 31: 2073-2078, 2006.
18. Appleby D, **Andersson G**, Totta M. Meta-Analysis of the Efficacy and Safety of Intradiscal Electrothermal Therapy (IDET). *Pain Medicine* 7: 308-316, 2006.

19. Manson NA, Goldberg EJ, **Andersson GBJ**. Sexual Dimorphism in Degenerative Disorders of the Spine. *Orthop Clin N Am* 37 (2006) 549-553.
20. Chujo T, An HS, Akeda K, Miyamoto K, Muehleman C, Attawia M, **Andersson G**, Masuda K. Effects of Growth Differentiation Factor-5 on the Intervertebral Disc – *In Vitro* Bovine Study and *In Vivo* Rabbit Disc Degeneration Model Study. *Spine* 31(25): 2909-2917, 2006.
21. Oleske DM, Morrissey Kwasny M, Lavender SA, **Andersson GBJ**. Participation in Occupational Health Longitudinal Studies: Predictors of Missed Visits and Dropouts. *Ann Epidemiol* 17:9-18, 2007.
22. Lavender SA, Lorenz EP, **Andersson GBJ**. Can a New Behaviorally Oriented Training Process to Improve Lifting Technique Prevent Occupationally Related Back Injuries Due to Lifting? *Spine* 32(4): 487-494, 2007.
23. Renner SM, Natarajan RN, Patwardhan AG, Havey RM, Voronov LI, Guo BY, **Andersson GBJ**, An HS. Novel model to analyze the effect of a large compressive follower pre-load on range of motions in a lumbar spine. *Journal of Biomechanics* 40 (2007) 1326-2332.
24. Natarajan RN, Williams JR, Lavender SA, **Andersson GBJ**. Poro-elastic finite element model to predict the failure progression in a lumbar disc due to cyclic loading. *Computers and Structures* 85 (2007) 1142-1151.
25. Alffram, P-A, Bruce L, Bjursten LM, Urban RM, **Andersson GBJ**. Implantation of the Femoral Stem into a Bed of Titanium Granules Using Vibration. A pilot study of a new method for prosthetic fixation in 5 patients followed for up to 15 years. *Uppsala J Med Sci* 112(2): 183-189, 2007.
26. Turner TM, Urban RM, Hall DJ, **Andersson GBJ**. Bone Ingrowth through Porous Titanium Granulate Around a Femoral Stem. Histological assessment in a six-month canine hemiarthroplasty model. *Uppsala J Med Sci* 112 (2): 191-197, 2007.
27. Oleske DM, Lavender SA, **Andersson GBJ**, Kwasny MM. Are Back Supports Plus Education More Effective Than Education Alone in Promoting Recovery From Low Back Pain? Results from a Randomized Clinical Trial. *Spine* 32(19):2050-2057, 2007.
28. Imai Y, Miyamoto K, An HS, Thonar EJ-MA, **Andersson GBJ**, Masuda K. Recombinant Human Osteogenic Protein-1 Upregulates Proteoglycan Metabolism of Human Anulus Fibrosus and Nucleus Pulposus Cells. *Spine* 32:12:1303-1309, 2007.
29. Williams JR, Natarajan RN, **Andersson GBJ**. Inclusion of regional poroelastic material properties better predicts biomechanical behavior of lumbar discs subjected to dynamic loading. *Journal of Biomechanics* 40 (2007) 1981-1987.
30. **Andersson GBJ**, Bridwell KH, Danielsson A, Dolan LA, Everett CR, Fisher CG, Eyal Mercado, Mulpuri K, Richards BS, Rubery PT, Sponseller PD, Weinstein JN. Evidence-Based Medicine Summary Statement. *Spine* 32,19S, ppS64-S65, 2007.
31. Chiba K, Masuda K, **Andersson GBJ**, Momhara S, Thonar EJ. Matrix replenishment by intervertebral disc cells after chemonucleolysis in vitro with chondroitinase ABC and chymopapain. *The Spine Journal* 7 (2007), 694-700.
32. Natarajan RN, Williams JR, Lavender SA, An HS, **Andersson GBJ**. Relationship between disc injury and manual lifting: A poroelastic finite element model study. *Proc. I Mech E* 222: 195-207, 2008.

33. **Andersson GBJ**, Kirkpatrick JS. Technology Assessment Applied to the Spine. *Spine* 33: 2025-2027, 2008.
34. Tosteson ANA, Skinner JS, Tosteson TD, Lurie JD, **Andersson GB**, Berven S, Grove MR, Hanscom B, Blood EA, Weinstein JN. The Cost Effectiveness of Surgical *Versus* Nonoperative Treatment for Lumbar Disc Herniation Over Two Years. *Spine* 33: 2108-2115, 2008.
35. Kloth DS, Fenton DS, **Andersson GBJ**, Block JE. Intradiscal Electrothermal Therapy (IDET) for the Treatment of Low Back Pain: Patient selection and indications for use. *Pain Physician* 11: 659-668-2008.

#### **Book Chapters / Books: (selected of 161)**

1. **Andersson GBJ**. Low Back Pain. *Conns Current Therapy* (Eds. Rakel & Bope). Elsevier Inc., Philadelphia, 2005 pp. 47-49.
2. Bijani A, Haman SP, **Andersson GBJ**. Lumbar Disc Disease in the Spine 5th Ed. (Eds. Herkowitz H, Garfin S, Eismont F, Bell G, Balderston), W. B. Saunders, Philadelphia, 2006, pp. 930-944.
3. Chaffin DB, **Andersson GBJ**, Martin BJ. *Occupational Biomechanics*, 4th Edition. John Wiley & Sons, New Jersey, 2006, pp. 1-360.
4. **Andersson GBJ**. Disability Evaluation. In *Orthopaedic Knowledge Update: Spine 3* (eds. Spivak JM, Connolly PJ), Amer Acad Ortho Surg, Rosemont, IL 2006, pp. 103-106.
5. Nordin M, **Andersson GBJ**, Pope MH (Eds). *Musculoskeletal Disorders in the Workplace: Principles and Practice*. Mosby, Inc., St. Louis, MO, 2007.
6. Stobo JD, Bloch FS, **Andersson GBJ**, et al. Improving the Social Security Disability Decision Process. Institute of Medicine, The National Academies Press, Washington, DC, 2007, pp. 1-139.
7. McGeary M, Ford MA, McCutchen SR, Barnes DK (Editors). *A 21st Century System for Evaluating Veterans for Disability Benefits*. Institute of Medicine, The National Academies Press, Washington, DC, 2007, pp. 1-375.
8. Gunzburg R, Szpalski M, **Andersson GBJ**. Degenerative Disc Disease. Lippincott Williams & Wilkins, 2007, pp. 1-275 (In Chinese).
9. Mayer TG, **Andersson GBJ**, Brown S, Mooney V, Travis RL. Spine and Pelvis. In *Guides to the Evaluation of Permanent Impairment*, 6th Edition. AMA, Chicago, IL 2008, pp. 557-601.
10. **Andersson GBJ** et al. The Burden of Musculoskeletal Diseases in the United States. *The Bone and Joint Decade*, Rosemont, IL. 2008, pp. 1-247.

#### **C. Research Support**

AR 48152                  Andersson (PI)                  08/01/06– 07/31/11  
NIH/NIAMS Program Project  
Intervertebral Disc Degeneration and Regeneration: Biomechanical and Biochemical Aspects

AR 45444                  Weinstein (PI)                  12/31/04-11/30/09  
NIH/NIAMS  
Consortium project  
Low Back Pain: A multi-center clinical trial