## Program for the ISSLS Meeting in 
Gothenburg, Sweden, June 14-18, 2011
Swedish Exhibition Centre

### TUESDAY JUNE 14, 2011

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<th>Time</th>
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<tr>
<td>07:30</td>
<td>Membership Committee Meeting</td>
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<tr>
<td>09.30</td>
<td>Strategy Group Meeting</td>
<td>R21</td>
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<td>12.00</td>
<td>Executive Committee – Lunch</td>
<td>R22/23</td>
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<tr>
<td>15.00</td>
<td>Registration</td>
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<tr>
<td>18.00</td>
<td>Welcome Reception</td>
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### WEDNESDAY, JUNE 15, 2011

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<tr>
<td>07.15</td>
<td>Registration</td>
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<tr>
<td>07.30</td>
<td>Welcome: Björn Rydevik</td>
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<td>07.35</td>
<td>Program Chairman: S Tim Yoon</td>
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#### SESSION # 1  Disc Biomechanics
Moderators: Howard An and Yong Hai

<table>
<thead>
<tr>
<th>Time</th>
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| 07.45-07.51 | Dynamic and static loading affects intervertebral disc cell viability in the loaded disc culture system  
| 07.53-07.59 | Mechanoregulation of nucleus pulposus cells by fluid shear stress  
Wang, P, Yang, L, **Hsieh, A**; Maryland, United States |
| 08.01-08.07 | Biomechanical differences between the intact spine and the spine instrumented with a total disc replacement (TDR)  
**Marras, W**, Knapik, G, Mendel, E: Ohio, United States |
| 08.09-08.18 | Discussion                                                               |
| 08.20-08.26 | Force required to delaminate the anulus fibrosus is altered following elastin digestion  
**Gregory, DE**, Pichika, R, Sah, R, Masuda, K: La Jolla, United States |
| 08.28-08.34 | Micromechanical characterization of inter- and intra-lamellar annulus fibrosus specimens  
**Isaacs, J**, Vresilovic, E, Marcolongo, M: Harrisburg, Philadelphia United States |
| 08.36-08.42 | Mechanical environment of anulus fissures  
| 08.44-08.53 | Discussion                                                               |

#### SESSION # 2  Disc Degeneration I (Morphology, Biology)
Moderators: Björn Rydevik and Daisuke Sakai

<table>
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<tr>
<th>Time</th>
<th>Topic</th>
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<tbody>
<tr>
<td>08.55-09.01</td>
<td>Intervertebral disc-derived stem cells: Implications for regenerative medicine and neural repair</td>
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</table>
8. Formation of lamellar cross bridges in the annulus fibrosus of the intervertebral disc is a consequence of vascular regression
   Smith, L, Elliott, D; Philadelphia, United States

9. Disc cellularity correlates with vertebral vascularity
   Buser, Z, Degmetich, S, Ryan, P, Liebenberg, E, Lotz, J; San Francisco, United States

Discussion

10. Single nucleotide polymorphism in the Nerve Growth Factor Beta (NGFB) gene predisposes to lumbar disc degeneration
    Rajasekaran S, Rishi Mugesh K, Senthil, N, Raveendran M, Cheung MC K, Chan, D: Coimbatore India, Hong Kong

11. In vitro Lifespan and Senescence Mechanisms of Human Nucleus Pulposus Chondrocytes
    Kim, KW, Chung, HN, Seoul, Republic of Korea

12. Basic research on cryopreservation of activated human nucleus pulposus cells
    Sakai, D, Hiyama, A, Nakai, T, Arai, F, Nakajima, D, Mochida, J, Tanaka, M: Kanagawa, Japan

Discussion

COFFEE

SESSION # 3

Disc Degeneration II (Imaging / Risk Factors)
Moderators: Dino Samartzis and Lori Setton

13. Degeneration in facet joints and intervertebral discs accelerates after the fourth decade
    Espinoza O, Alejandro A.; Siemionow, K; An, HS.; Andersson, GBJ, Inoue, N: Chicago, IL, United States

14. Discography contrast solution exposure has deleterious effects on cell proliferation and viability of human annulus cells in vitro

15. The association of abdominal obesity on magnetic resonance imaging with lumbar disc degeneration among young adults
Takatalo, J, Karppinen, J, Taimela, S, Niinimäki, J, Laitinen, J4; Blanco Sequeiros, R, Tammelin, T, Korpelainen, R, Tervonen, O: Oulu, Finland

11.09-11.18  Discussion

11.20-11.26  16. Effect of diminished flow in rabbit lumbar arteries on intervertebral disc matrix changes: evaluation with T2 values using 3T-MRI
Imanishi, T, Akeda, K, Sudo, A: Tsu, Japan

11.28-11.34  17. Higher bone mineral density of the vertebral body (not the whole vertebra) is associated with more lumbar disc degeneration
Wang, Y, Boyd, S, Battie, M, Yasui, Y, Videman, T: Edmonton and Calgary, Canada

11.36-11.42  18. Cross-sectional study using T1<rho> weighted MRI of early lumbar disc degeneration in healthy young adults

11.44-11.53  Discussion

11.55-01.10  LUNCH

SESSION # 4  Low Back Pain I
Moderators: David Hall and Yossef Masharawi

13.10-13.16  19. Intervertebral disc degeneration on MRI is associated with low back pain: a population-based study
Samartzis, D, Karppinen, J, Chan, D, Luk, K, Cheung, K: Hong Kong

13.18-13.24  20. Lumbar disc changes on MRI and low back pain. A prospective long-term study in healthy volunteers from childhood to maturity
Lund, T, Klemetti, E, Lohman, M, Kettunen, J, Osterman, K, Schlenzka, D: Helsinki, Finland

13.26-13.32  21. Temporal interactions of degenerative changes in individual components of the lumbar intervertebral discs: A sequential MRI study in patients less than forty years of age
Sharma, A, Parsons, M, Pilgram, T: St. Louis, MO, United States

13.34-13.43  Discussion

13.45-13.51  22. In vivo topographic analysis of lumbar facet joint space width
distribution in healthy and symptomatic subjects
Simon, P, Espinoza O, Alejandro A, An, HS, Andersson, GBJ,
Inoue, N: Chicago, United States

13.53-13.59 23. Decompression alone is effective in lumbar spinal stenosis with or without degenerative spondylolisthesis, but is low back pain relieved?
Miyauchi, A, Sumida, T, Manabe, H; Kobayashi, K, Fujiwara, Y, Sumen, Y: Hiroshima, Japan, Onomichi, Japan

14.01-14.07 24. Why do some people experience no low back pain? – Comparison of a middle-aged working population to a population-based cohort
Melloh, M, Rolli Salathé, C, Lüthi, I, Semmer, N, Elfering, A: Dunedin, New Zealand and Berne, Switzerland

14.09-14.18 Discussion

SESSION # 5
Low Back Pain II
Moderators: Anne Mannion and Douglas Wardlaw

14.20-14.26 25. Register based comparative study of LBP alleviation after total disc arthroplasty or ALIF
Munting, E, Aghayev, E, Röder, C, SWISSspine, Registry Group3: Spine Tango, Registry Group: Ottignies, Belgium and Bern, Switzerland

14.28-14.34 26. Low back pain and health-related quality of life in patients surgically treated for idiopathic scoliosis 21 to 41 years later

14.36-14.42 27. The prevalence and clinical features of juxtafacet cysts after microsurgical bilateral decompression via a unilateral approach for degenerative lumbar disease (MBDU)
Kato, M, Konishi, S, Date, Y, Shinhara, Y, Kazuki, K, Nakamura, H: Osaka, Japan

14.44-14.53 Discussion

Macedo, L, Latimer, J, Maher, C, Hodges, P, Nicholas, M, Tonkin, L, McAuley, J, Stafford, R: Edmonton, Canada, Sydney, Australia
and Brisbane, Australia

15.03-15.09  29. Are patterns of lumbar disc degeneration associated with low back pain? New insights based on skipped level disc pathology
   **Samartzis, D**, Karppinen, J, Luk, K Cheung, K: Hong Kong and, Oulu, Finland

15.11-15.17  30. Shape variation of the neural arch in the thoracic and lumbar spine: Characterization of its asymmetry and relationship with the vertebral body
   **Masharawi, Y**, Salame, K: Tel Aviv, Israel

15.19-15.28  Discussion

15.30-16.00  COFFEE

**SESSION # 6**

Outcomes and Psychosocial
Moderators: Michelle Battié and Alison McGregor

16.00-16.06  31. A validated new spine surgery specific morbidity score to predict postoperative morbidity and mortality in elective spine surgery
   Manu, A, Shetty, AP, **Rajasekaran S**; Rishi Mugesh, K: Coimbatore, India

16.08-16.14  32. Surgeon and patient pre-operative expectations of surgical outcome differ, but whose prediction is closer to the reality?
   **Lattig, F**, Fekete Tamás F, Grob, D, O’Riordan, D, Kleinstueck, F, Jeszenszky, D, Mutter, U, Porchet, F, Mannion, A: Zurich, Switzerland

16.16-16.22  33. Effect of smoking and smoking cessation on spine care
   **Behrend, C**, Prasarn, M, Coyne, E, Horodyski, MB, Wright, J, Rechtine, G: Rochester, United States and Gainesville, United States

16.24-16.30  34. Job strain, an important factor for back and neck pain
   Courvoisier, D, **Genevay, S**, Cedraschi, C, Bessire, N, Griesse-Delacretaz, AC, Monnin, D, Perneger, T: Geneva, Switzerland

16.32-16.44  Discussion

16.50-       FIRST BUSINESS MEETING
THURSDAY, JUNE 16, 2011

07.30  Registration

SESSION # 7  SPECIAL EMPHASIS POSTER SESSION #1
07.45-08.45  (see special program for location)

SESSION # 8  Lumbar Disc Herniation Pathomechanism
Moderators: Shinichi Kikuchi and Björn Strömqvist

08.55-09.01  35. Association of the Tag SNPs in the human SKT gene with lumbar disc herniation
Karasugi, T, Semba, K, Kawaguchi, Y, Chiba, K, Mikami, Y, Togawa, D. Kanayama, M, Karppinen, J, Kimura, T, Kubo, T, Toyama, Y, Mizuta, H, Shiro, I: Tokyo, Japan, Kumamoto, Japan, Toyama, Japan; Tokyo, Japan, Hakodate, Japan, Oulu, Finland;

09.03-09.09  36. Experimental disc degeneration is associated with a decreased ability to resist anular delamination IPW Gregory, DE, Brown, S, Bae, W, Sah, R, Masuda, K: La Jolla, US, Guelph, Canada, San Diego, US

09.11-09.17  37. High resolution 3D MRI to quantify human disc tear geometry and location
Yoder, JY, Moon, SM, Wright, AC, Vresilovic, EJ, Elliott, DM: Philadelphia, United States, Hershey, United States

09.19-09.25  38. Differential structure-function mechanisms of the inner and outer annulus fibrosus in tension
Han, W, Nerurkar, NL, Jacobs, NT, Smith, LJ, Mauck, RL, Elliott, DM: Philadelphia, United States

09.27-09.39  Discussion

09.40-10.25  COFFEE

SESSION #9  Lumbar Disc Disease (Treatment and Outcome)
Moderators: Serena Hu and Kazuhisa Takahashi

10.25-10.31  39. Prediction of outcome after surgery for lumbar disc herniation in Sweden - analysis of data from Swespine - the National Spine Register
Fritzell, P, Strömquist, B, Jönsson, B, Hägg, O: Lund, Sweden and Gothenburg, Sweden
10.33-10.39  40. Explained variance in leg pain 1 year after lumbar disc herniation
Lurie, J, Berven, S, Boden, S, Zhao, W, Tosteson, T, Tosteson, A: San Francisco, CA, United States; Atlanta, GA, United States; Lebanon, NH, United States

10.41-10.47  41. Blocking NF-kB activation delays the onset of age-dependent spinal degeneration

10.49-10.55  42. UTE MRI of lumbar spine endplate: Sensitivity to surface roughness
Bae, W, Xu, L, Inoue, N, Yamaguchi, T, Bydder, G, Masuda, K: San Diego, La Jolla, United States and Kyoto, Japan

10.57-11.09  Discussion

11.11-11.17  43. Progression of adjacent segment disc degeneration 29 years after uninstrumented in situ fusion for isthmic spondylolisthesis grade III-V
Tzortzakakis, A, Joelson, A, Danielson, B, Frennered, K: Gothenburg, Sweden

11.19-11.25  44. Long-term outcomes following lumbar spine fusion for adult isthmic spondylolisthesis: a comparison of PLIF vs PLF
Cunningham, J, Robertson, P, Auckland, New Zealand

11.27-11.33  45. Development of minimal invasive treatment with active recombinant human MMP-7 for herniated disc patients- how to facilitate natural herniated disc resorption
Haro, H, Komori, H, Kato, T, Ohba, T, Ebata, S, Fujita, K,; Yamanashi, Japan, Yokohama, Japan,

11.35-11.41  46. MRI perfusion studies of disc nutrition: investigations of the vertebral body blood supply
Ciavarro, Cr, Zerbi, A, McCall, I, Roberts, S, Urban, J, Brayda-Bruno, M: Milan, Italy, Oswestry, United Kingdom, Oxford, United Kingdom

11.43- 11.55  Discussion

11.55-12.35  HARRY FARFAN PRESIDENTIAL LECTURE
Introduction – Howard An
Guest Speaker – Professor Victor Haughton
Title: A step beyond Mixter and Barr and a new focus for spine imaging

12.35-13.00

Presidential address – Howard An
Introduction – Robert Moore

AFTERNOON OUTING
FRIDAY, JUNE 17, 2011

07.30 Registration

SESSION # 10 Fusion
Moderators: Kazuhiro Chiba and Barend Van Royen

07.35-07.41 47. Does the formation of endplate cyst predict the nonunion after lumbar interbody fusion?
Fujibayashi, S, Neo, M; Takemoto, M, Okamoto T, Nakamura, T: Kyoto, Japan

07.43-07.49 48. Prospective study of the effect of pedicle screw placement on development of the immature vertebra in an in vivo porcine model
Fekete Tamás, F, Kleinstueck, F, Mannion, A, Kendik, Z, Jeszenszky, D: Zurich, Switzerland, Budapest, Hungary

07.51-07.57 49. Single-level instrumented posterolateral fusion of the lumbar spine with a local bone graft versus an iliac crest bone graft: A prospective, randomized study with 2-year follow-up

7.59-8.08 Discussion

08.10-08.16 50. Early bone formation prevents premature failure of biodegradable scaffolds in porcine model of anterior lumbar interbody fusion
Abbah, SA, Ramruttun, KA, Hutmacher, WD, Goh, CHJ, Wong, HK: Singapore and Brisbane, Australia

08.18-08.24 51. Surgeon radiation exposure in minimally invasive transforaminal lumbar interbody fusion
Funao, H, Ishii, K, Kaneko, Y, Momoshima, S, Otani, M, Hosogane, N, Watanabe, K, Tsuji, T, Nakamura, M, Toyama, Y, Chiba, K, Matsumoto, M: Tokyo, Japan; Kawasaki, Japan

08.26-08.32 52. Three dimensional asymmetrical pedicle subtraction osteotomy: Successful application for rigid degenerative lumbar kyphoscoliosis

08.34-08.43 Discussion
SESSION # 11  GENERAL POSTER SESSION, ODD NUMBERS
8.45-9.15

SESSION # 12  GENERAL POSTER SESSION, EVEN NUMBERS
9.15-9.45
9.45-10.00  COFFEE

SESSION # 13  Chairman : Robert Moore
10.00 – 10.25  Introduction of Fellowships - Anne Mannion

The ISSLS Macnab/Larocca Research Fellowship Award
Report by the recipient 2010 - Luciana Macedo
Announcement of winner 2011

The ISSLS Clinical Travelling Fellowship - sponsored by Globus
Report by the recipient 2010 - Janardhana Aithala P
Announcement of winner 2011

The International ISSLS Fellowship - sponsored by Eisai
Presentation of Spine Young Investigators Award
by Scott Boden

Title: Increased fat mass is associated with high levels of low back pain intensity and disability

SESSION # 14  THE ISSLS PRIZE PAPERS - sponsored by DePUY SPINE™
10.25-10.34  Introduction and Award Ceremony
Chairman - Gunnar Andersson

10.36-10.46  53. ISSLS PRIZE - CLINICAL
Function after spinal treatment, exercise and rehabilitation (FASTER): A factorial randomised trial to determine whether the functional outcome of spinal surgery can be improved

10.48-10.54  Discussion
Adaptations to the multifidus muscle in response to experimentally induced intervertebral disc degeneration

Smudging the motor brain in recurrent low back pain
Hodges, P, Tsao, H, Danneels, L, Brisbane, Australia and Ghent, Belgium

Genetic influences on lumbar spinal stenosis: A multivariate twin study
Battié, M, Ortega-Alonso, A, Niemelainen, R, Gill, K, Levalahti, E, Kaprio, J, Videman, T: Edmonton, Canada, Helsinki, Finland; Dallas, United States

Lumbar spinal stenosis is a negative influence on quality of life: An epidemiologic and cross-sectional study in the community
Otani, K, Kikuchi, S, Yabuki, S, Igarashi, T, Nikaido, T, Watanabe, K, Konno, S; Fukushima City, Japan

A prospective randomized controlled study comparing unilateral and bilateral pedicle screw fixation in transforaminal lumbar interbody fusion for degenerative spondylolisthesis
Aoki, Y, Yamagata, M, Ikeda, Y, Nakajima, F, Orita, S, Nakagawa, K, Nakajima, A, Furufu, T, Suguro, T, Ohtori, S, Takahashi, K: Sakura, Japan, Ichihara, Japan and Chiba, Japan

Natural history of lumbar spinal stenosis
Frennered, K, Wessberg, P: Gothenburg, Sweden

The prevalence of the lumbar spinal stenosis with mobile MRI in a population-based cohort: The ROAD-MRI study
Ishimoto, Y, Yoshida, M, Yamada, H, Nagata, K, Hashizume, H, Takiguchi, N, Muraki, S, Oka, N, Akune, T, Yoshimura, N: Wakayama city, Japan and Tokyo, Japan

13.41-13.47  61. Degenerative spondylolisthesis in the spine patient outcomes research trial (SPORT): Does psychological distress affect treatment outcome?
Davis, G, Spratt, KF. Abdu, WA, Moschetti, W, Zhao, W, Albert, A, Weinstein, J: Lebanon, United States

13.49-13.58  Discussion

SESSION # 16

The Aging Spine

Degenerative Lumbar Spinal Stenosis /Osteoporosis/Tumor
Moderators: Jim Kang and Margareta Nordin

14.00-14.06  62. Cost-effectiveness of balloon kyphoplasty (BKP) vs. standard medical treatment for vertebral compression fractures due to osteoporosis - a multicenter RCT with a two-year follow up in Sweden
Fritzell, P, Ohlin, A, Borgström, F: Falun, Sweden; Malmö, Sweden; and Stockholm, Sweden

14.08-14.14  63. Conservative managements for osteoporotic thoracolumbar vertebral compression fractures -A multicenter prospective RCT
Chiba, K, Yoshida, M, Shinomiya, K, Satomi, K, Nagata, K: Tokyo, Japan; Wakayama, Japan

14.16-14.22  64. Vertebroplasty versus corrective surgery with instrumentation for patients with neurological deficit caused by insufficient union following osteoporotic vertebral fracture
Hoshino, M, Kato, M, Suzuki, A, Matsumoto, T, Tsujio, T, Toyoda, H, Terai, H, Konishi, S, Seki, M, Nakamura, H: Nara, Japan; Osaka, Japan

14.24-14.33  Discussion

14.35-14.41  65. Survival prognosis in patients with newly diagnosed metastatic spinal tumor by the Revised Tokuhashi Score
Takuya, K, Aota, Y, Nakamura, N, Mroz, TE, Lieberman IH Yamashita, T, Tanabe, H, Nakamura, Y, Yamaguchi, Y, Saito, T: Yokohama, Japan; Cleveland, United States

14.43-14.49  66. Long term follow up of a prospective randomized study of chemonucleolysis compared to surgery for sciatica
Wardlaw, D, Vadvha, M, Sabboubeh, A: Aberdeen, United
Use of bone morphogenetic proteins in spinal fusion surgery for older adults with lumbar stenosis: trends, complications, repeat surgery, and charges

**Deyo, R, Ching, A, Matsen, L, Martin, B, Kreuter, W, Jarvik, J, Angier, H, Mirza, S:** Portland, OR, United States; Hanover, NH, United States; Seattle, WA, United States

Predictive value of the Tokuhashi scoring systems in various original sites of spinal metastases

**Wang M, Li, H, Hoey, K, Hansen, ES, Niedermann, B, Helmig, P, Wang, Y, Aras, E, Bunger, CE:** Aarhus, Denmark

**Discussion**

15.20-15.40  
**COFFEE**

**SESSION # 17**  
**DEBATE**

Moderator: S Tim Yoon

**Title: Intent To Treat Analysis In Prospective Randomized Surgical Trials Is The Best way to analyze the data**

15.40-15.48  
Proposer: Richard Deyo

15.50-15.58  
Opposer: Sigurd Berven

16.00-16.12  
Discussion

**Title: The Future Is Bright For Stem Cells Therapies For Spinal Fusion**

16.14-16.22  
Proposer: Jeffrey Lotz

16.24-16.32  
Opposer: Helena Brisby

16.38-16.50  
Discussion

17.00  
**SECOND BUSINESS MEETING**

**BANQUET** – More information in the social program
SATURDAY, JUNE 18, 2011

SESSION # 18  SPECIAL EMPHASIS POSTER SESSION #2
07.45-08.45 (see special program for location)

SESSION # 19  Complications
Moderators: Hwan Mo Lee and Teija Lund

08.50-08.56  69. Surgical Site Infection (SSI) in spinal surgery: Clinical application of administrative claims data

08.58-09.04  70. Iatrogenic dural lesions in decompression for lumbar spinal stenosis
Strömqvist, B, Strömqvist, F, Jönsson, B: Lund, Sweden; Ljungby, Sweden

09.06-09.12  71. The risk factors for postoperative spinal epidural hematoma
Fujiwara, Y, Sumida, T, Manabe, H, Rikita, T, Kobayashi, K, Miyauchi, A, Fujioka, Y: Hiroshima, Japan

09.14-09.23  Discussion

SESSION # 20  Cell Biology
Moderators: Sally Roberts and Keizuke Takahashi

09.25-09.31  72. Demonstration of BMP inhibition by noggin in an in vivo rodent spinal fusion model: differential effects of BMP-7, BMP-6 and mutated BMP-7
Jenis, L, Wingard, J, Terwilliger, E: Newton, MA, United States; Boston, MA, United States

09.33-09.39  73. Collagen-free polyelectrolyte coated micro-carriers of rhBMP-2 enhanced posterolateral spinal fusion in rats
Abbah, SA, Goh, CHJ, Wong, HK: Singapore, Singapore

09.41-09.47  74. Successful spinal fusion by E. coli-derived BMP-2-adsorbed porous <beta>-TCP granules

9.49-9.58  Discussion
SESSION # 21  Anatomy/Biomechanics
Moderators: Paul Hodges and Mohammed Mossaad

10.00-10.06  75. Changes in 3D endplate geometry associated with disc degeneration
Espinoza O, Alejandro A, LaBelle, M, An, HS. Andersson, GBJ, Inoue, N: Chicago, IL, Evanston, IL, United States

10.08-10.14  76. Accelerated 'creep' deformation of human vertebrae
Luo, J, Pollintine, P, Dolan, P, Adams, M: Bristol, United Kingdom

10.16-10.22  77. Endplate roughness in human lumbar spine: Level and topographic variations
Xu, L, Bae, W, Yamaguchi, T, Sah, R, Inoue, N, Masuda, K: San Diego, La Jolla, United States; Kyoto, Japan

10.24-10.33  Discussion

10.35-10.55  COFFEE

SESSION # 22  Pain and Fusion Outcomes
Moderators: Kjell Olmarker and S Rajasekaran

10.55-11.01  78. Direct infiltration of spinal nerves with a TNF-<alpha> inhibitor (etanercept) to treat sciatica in patients with lumbar spinal stenosis. Prospective randomized study compared with dexamethasone

11.03-11.09  79. Can pain due to lumbar spine diseases be measured? An analysis using MR spectroscopy
Yabuki, S, Konno, S, Kikuchi, S, Fukushima, Japan

11.11-11.17  80. Effect of anti-NGF receptor (p75 Neurotrophin Receptor) on pain behavior and activation of spinal glia in the rat sciatic nerve

11.19-11.28  Discussion

11.30-11.36  81. Sensory and motor deficit following trans-psoatic lateral lumbar interbody fusion
Pumberger, M, Kotwal, S, Gogia, J, Lebl RD, Abjornson, C, Fantini, GA, Hughes AP, Sama A; Cammisa FP, Girardi, FP: New York, United States

11.38-11.44 82. Outcome and complications of pedicle subtraction osteotomy in cases with single versus two attending surgeons
Sassan, K, Deviren, V, Ames, C: San Francisco, United States

11.46-11.52 83 Single-, 2-, and 3-level instrumented posterolateral fusion of the lumbar spine with a local bone graft: a prospective study with a 2-year follow-up

11.54-12.03 Discussion

12.05 - ANNOUNCEMENT – MEDTRONIC BEST PAPER AND POSTER AWARDS
Chairman-Douglas Wardlaw
Closing Remarks-S Rajasekaran

MEETING ADJOURNED