BIOSpine 6
International Congress on Biotechnologies for Spinal Surgery

NSpine Symposium
NSpine Symposium
April 28, 2017

Satellite Symposium:
Final Programme

AUG 26–28, 2017
BERLIN

www.biospine.org
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Organisation and imprint

Venue
Langenbeck-Virchow-Haus
Luisenstrasse 58/59 • 10117 Berlin (DE)

Date
April 26–28, 2017

Organiser
Regenerate Europe e. V.

Congress chairs
Hans Jörg Meisel, MD PhD
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Halle, Saale (DE)

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Campus Bio-Medico University of Rome
Department of Orthopaedic and Trauma Surgery
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Welcome note of the congress chairs

Dear colleagues and friends,

On behalf of the board of the European Network for Regenerative Medicine, we are pleased to welcome you in Berlin from April 26–28, 2017 to our 6th International Congress on Biotechnologies for Spinal Surgery (BioSpine 6).

Over the 15 years that have elapsed since we started BioSpine in 2002, an entire sector of innovative nano- and biotechnology products has been developed for use in spinal surgery that almost all industrial partners now include in their “Biospine-Products” portfolio. Development and improvement of therapeutic options still needs high quality academic support. In particular, the clinical knowledge from the medical point of view needs a strong and sustained support from academia and industry.

BioSpine was founded to serve as a catalyst between physicians and scientists, offering a means of developing a new language that would facilitate interaction.

The advent of bio-nanomaterials recently available on the market will revolutionize the field of spinal surgery. Nanoscaffolds, growth factors, cell products, combination products, polymer innovation, and modified metal surfaces requiring various regulations to meet clinical use approval are either in testing or have been approved.

BioSpine was initiated to give insights into technology development, has the aim to impart understanding and acceptance, but also wants to sharpen a critical view. BioSpine has also assumed the important role of providing information to the end consumer that in the same time brings scientists in a common dialogue to strengthen the future industrial research close to the surgeon’s needs.

Spinal science subsists from the lively exchange of information. We are looking forward to fruitful conversations, vigorous discussions and the mutual exchange of knowledge.

On behalf of the organising committee and advisory board,

Hans Jörg Meisel, MD PhD

Gianluca Vadalà, MD PhD
Committees and invited speakers

Organising committee
Yong Eun Cho (Seoul/KR)
Alberto Di Martino (Rome/IT)
Sybille Grad (Davos/CH)
Roger Härtl (New York, NY/US)
Christian Hohaus (Dessau, Leipzig/DE)
Christian Jorgensen (Montpellier/FR)
James D. Kang (Boston, MA/US)
Meriem Lamghari (Porto/PT)
Daisuke Sakai (Tokyo/JP)

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Lorin Michael Benneker (Bern/CH)
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Finn Bjarke Christensen (Aarhus/DK)
Vincenzo Denaro (Rome/IT)
Lisa Ferrara (Southport, NC/US)
Jörg Franke (Magdeburg/DE)
Timothy Ganey (Atlanta, GA/US)
Robert Gunzburg (Antwerp/BE)
Marco N. Helder (Amsterdam/NL)
Jean-Charles Le Huec (Bordeaux/FR)
H. Michael Mayer (Munich/DE)
Björn P. Meij (Utrecht/NL)
Michael Ogon (Vienna/AT)
Enrico Pola (Rome/IT)
Jeffrey Wang (Los Angeles, CA/US)
Hans-Joachim Wilke (Ulm/DE)
Michael Winking (Osnabrück/DE)

Invited speakers
Mauro Alini (Davos/CH)
Lorin Michael Benneker (Bern/CH)
Finn Bjarke Christensen (Aarhus/DK)
Vincenzo Denaro (Rome/IT)
Mark Erwin (Toronto/CA)
Cesare Faldini (Bologna/IT)
Lisa Ferrara (Southport, NC/US)
Benjamin Gantenbein (Bern/CH)
Sibylle Grad (Davos/CH)
Christian Hohaus (Dessau, Leipzig/DE)
Inbo Han (Seongnam-si/KR)
Roger Härtl (New York, NY/US)
Patrick Hsieh (Los Angeles, CA/US)
Christian Jorgensen (Montpellier/FR)
James D. Kang (Boston, MA/US)
Meriem Lamghari (Porto/PT)
Cornelia Neidlinger-Wilke (Ulm/DE)
Christian Papilloud (Halle, Saale/DE)
Dino Samartzis (Hong Kong/CH)
Johannes Seeger (Leipzig/DE)
Marianna A. Tryfonidou (Utrecht/NL)
Hans-Joachim Wilke (Ulm/DE)
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Scientific programme • Wednesday, April 26

08:30–08:45  Introduction  
*H. J. Meisel (Halle, Saale/DE), G. Vadalà (Rome/IT)*

08:45–09:15  Keynote session  
Chair  
*S. Grad (Davos/CH)*

08:45  Mesenchymal stem cell application in rheumatology – Where do we stand?  
*C. Jorgensen (Montpellier/FR)*

09:05  Discussion

09:15–09:55  Quick fire session • Cell biology in spine research  
Chairs  
*B. Gantenbein (Bern/CH), Z. Li (Davos/CH)*

09:15  Engineered bombyx mori silk scaffolds to differentiate human mesenchymal stem cells towards intervertebral disc-like cells for disc repair  
*D. A. Frauchiger, S. Heeb (Bern/CH), M. Wöltje (Dresden/DE)  
L. M. Benneker, B. Gantenbein (Bern/CH)*

09:20  Protocols for isolation of nucleus pulposus progenitor cells from bovine intervertebral disc  
*D. A. Frauchiger, A. Tekari, L. M. Benneker (Bern/CH)  
D. Sakai (Isehara, Kanagawa/JP), S. Grad (Davos/CH)  
J. Stoyanov, A. Bertolo (Nottwil/CH), B. Gantenbein (Bern/CH)*

09:25  Which iodinated contrast media is the least cytotoxic to human disc cells?  
*Y. E. Cho, H. J. Lee, K. H. Kim (Seoul/KR)*

09:30  Influence of intervertebral disc cells on matrix mineralization in primary human osteoblasts  
*R. May, A. Tekari, D. Frauchiger, L. Benneker, S. Kohl  
B. Gantenbein (Bern/CH)*

09:35  Interneurons in the spotlight for recovery after spinal cord injury  
*J. Glumm, M. Pohland, J. Kiwit (Berlin/DE)*

09:40  Discussion

09:55  Coffee break, poster and industrial exhibition
10:15–11:45 RESPINE workshop

**Chairs**
C. Jorgensen (Montpellier/FR), G. Vadalà (Rome/IT)

Regenerative therapy of IVD: A double blind phase 2b trial of intradiscal injection of mesenchymal stromal cells in degenerative disc disease of the lumbar spine unresponsive to conventional therapy

10:15 Preclinical studies of MSC in degenerative disc disease
H. J. Meisel (Halle, Saale/DE)

10:30 How to assess MRI in degenerative disc disease after MSC treatment
G. Vadalà (Rome/IT)

10:45 NP cells regeneration
J. Clouet (Nantes/FR)

11:00 Clinical assessment after corticoid intradiscal injections
F. Rannou (Paris/FR)

11:15 RESPINE – MSC for degenerative disc disease treatment: Where do we stand?
C. Jorgensen (Montpellier/FR)

11:30 Discussion

11:45–12:30 Keynote session

**Chair**
F. B. Christensen (Aarhus/DK)

11:45 Principles of minimally invasive spinal surgery and spinal navigation
R. Härtl (New York, NY/US)

12:05 Discussion

12:15 Non-traditional technology for chronic pain and PTSD: Non pharmacological intervention with transcranial magnetic stimulation for spine pain?
B. Kawliche (Brandon/GB)

12:25 Discussion

12:30 Lunch break, poster and industrial exhibition
13:10–14:20 BioSpine session • Disc regeneration

**Chairs**
M. Alini (Davos/CH), J. Gansau (Dublin/IE)

13:10

**Best abstract presentation**

06 Engineering bioactive scaffolds for intervertebral disc repair/regeneration
A. Gloria, L. Ambrosio (Naples/IT)

13:25

CD146 positive mesenchymal stem cell possess a superior migration potential both in vitro and in whole organ culture
S. Wangler, M. Peroglio, Z. Li, U. Menzel (Davos/CH), L. M. Benneker (Bern/CH)
G. Richards, M. Alini, S. Grad (Davos/CH)

13:35 Nasal chondrocytes are potential autologous cell-transplant candidates for treating degenerative disc disease
M. H. Gay, A. Mehrkens, A. Barbero, I. Martin, S. Schären (Basel/CH)

13:45 Biomechanics of allograft supplementation in intervertebral disc intervention
J. Dmochowski, L. Losada Jr., W. Hutton (Atlanta, GA/US), S. Gonzalez
S. Namin (Marietta, GA/US), T. Ganey (Atlanta, GA/US)

13:55 Transpedicular approach for regenerative medicine of intervertebral disc in an ovine model – a multimodal analysis of vertebra and cartilage consequences
L. Le Fournier (Angers/FR), M. Fusellier, B. Halgand, J. Lesoeur
O. Gauthier (Nantes/FR), P. Menei, C. Montero-Menei (Angers/FR)
J. Guicheux, J. Clouet (Nantes/FR)

14:05 Discussion

14:20–15:40 BioSpine session • Cervical spine surgery

**Chairs**
L. M. Benneker (Bern/CH), M. Erwin (Toronto/CA)

14:20

**Invited talk**

Subaxial cervical spine deformities – approaches to surgical care
J. D. Kang (Boston, MA/US)

14:35 Discussion
14:40  **Invited talk**  
Laminectomy and instrumented fusion in lordosis for multilevel cervical myelopathy – relive surgery  
*V. Denaro (Rome/IT)*  

14:55  **Discussion**

15:00  **Patient-specific surgical guides for pedicle spine screws placement:**  
011 Proposal of a new design  
*P. D. Parchi, L. Andreani, G. Evangelisti, M. Carbone, S. Condino*  
*F. Vincenzo, M. Lisanti (Pisa/IT)*  

15:10  **3-D specimen specific kinematic analysis of a polycrystalline diamond cervical total disc arthroplasty**  
012  
*R. Havey, L. Voronov, S. Khayatzadeh, G. Carandang, K. Blank*  
*A. Patwardhan (Hines, IL/US)*  

15:20  **Wearable augmented reality to aid percutaneous procedures in spine surgery – proposal of a new system**  
013  
*P. D. Parchi, L. Andreani, F. Cutolo, M. Carbone, V. Ferrari, M. Ferrari*  
*M. Lisanti (Pisa/IT)*  

15:30  **Discussion**

15:40  **Coffee break, poster and industrial exhibition**

**16:00–17:00  Debate session • Minimally invasive fusion for degenerative lumbar spondylolisthesis**  

**Moderator**  
*R. Härtl (New York, NY/US)*

*Pro: L. M. Benneker (Bern/CH)*  
*Contra: F. B. Christensen (Aarhus/DK)*
Scientific programme • Wednesday, April 26

17:00–18:00 Working group session
Chairs S. Grad (Davos/CH), Y. E. Cho (Seoul/KR)

17:00 Gene therapy applications for intervertebral disc degeneration
J. D. Kang (Boston, MA/US)

17:15 Discussion

17:20 Spinal phenotyping – in pursuit of a common language
D. Samartzis (Hong Kong/CN)

17:35 Discussion

17:40 Interdisciplinary research for new solutions in disc regeneration
G. Vadalà (Rome/IT)

17:55 Discussion

19:00 Welcome reception

Highly specialized – Trauma Center Bergmannstrost

- General, Visceral and Vascular Surgery
- Anesthesiology, Intensive and Emergency Care
- Burn Injuries
- Early Rehabilitation
- Internal Medicine
- Medical Psychology
- Neurosurgery
- Neurology with Stroke Unit
- Neuro-Urology
- Orthopedics
- Physical and Rehabilitative Medicine
- Plastic and Hand Surgery
- Spinal Cord Injuries
- Radiology
- Pain Medicine
- Accident and Reconstructive Surgery

The Bergmannstrost is part of the nationwide Group of BG Clinics.

www.bergmannstrost.de
08:00–09:45  BioSpine session • Bone and spinal cord regeneration
Chairs: B. Gantenbein (Bern/CH), M. Lamghari (Porto/PT)

08:00  Invited talk
Analysis of bone regeneration with different doses of rhBMP-2 in an ovine lumbar interbody fusion model
J. Seeger (Leipzig/DE)

08:15  Is there an optimal concentration of rhBMP 2 for spinal fusion – findings of a large animal model?
C. Hohaus (Halle, Saale; Dessau/DE), G. S. Heil, H. J. Meisel (Halle, Saale/DE)

08:25  Discussion

08:30  Invited talk
Translation in nanomedicine – Germany and Europe
C. Papilloud (Halle, Saale/DE)

08:45  Discussion

08:50  Patient-specific fracture risk assessment of vertebrae – a multiscale approach coupling X-ray physics and continuum micromechanics
C. Hellmich, R. Blanchard (Vienna/AT), C. Morin (Saint Etienne/FR), Z. Sant (Msida/MT)

09:00  In toto and expanded human vertebral bone marrow cells cultured under normoxic and hypoxic condition: A novel strategy for spine surgery
G. Barbanti Brodano, F. Salamanna, C. Griffoni, A. Gasbarrini, S. Bandiera, S. Terzi, R. Ghermandi, S. Boriani, M. Fini (Bologna/IT)

09:10  Nerve cells decide to orient inside an injectable hydrogel with minimal structural guidance
L. De Laporte, J. Rose, A. Anarkoli-Omidinia (Aachen/DE)

09:20  Experimental method of spinal cord injury treatment using magnetic nanoparticles influenced by an external magnetic field
S. Kolesov, A. Panteleyev, A. Kazmin, M. Sazhnev (Moscow/RU)

09:30  Discussion

09:45  Coffee break, poster and industrial exhibition
Scientific programme • Thursday, April 27

10:05–11:05 Keynote session
Chair D. Samartzis (Hong Kong/CN)

10:05 Biology of age-associated intervertebral disc degeneration
J. D. Kang (Boston, MA/US)

10:25 Discussion

10:35 Advances in surface engineering of spine implants stimulate biologic responses
P. J. Slosar (San Francisco, CA/US)

10:55 Discussion

11:05–11:40 Quick fire session • Minimally invasive spine surgery and fusion
Chairs E. Pola (Rome/IT), B. Rieger (Dresden/DE)

11:05 Destiny of fractured cervical allospacer cage made by allobone in ACDF:
Fracture rate, fusion rate, and revision surgery rate
S. Kuh, D. Ryu, J. Ju (Seoul/KR)

11:10 First clinical results of minimally invasive vector lumbar interbody fusion
(MIS-VLIF) in spondylodiscitis and concomitant osteoporosis – development of the k-template to facilitate the use of mis-vlif in degenerative listhesis:
Implants and biomechanical behavior
W. H. Polanski (Dresden/DE), H. Jiang (Dresden/DE, Beijing/CN)
D. Ruess (Cologne/DE), C. Reinshagen (Boston, MA/US)
M. Molcanyi (Cologne/DE), J. Zivcak (Kosice/SK), H. Tong (Beijing/CN)
G. Schackert, B. Rieger (Dresden/DE)

11:15 Navigation guided endoscopic decompression of lumbar spinal stenosis via
translaminar approach – introduction of the spondyloskop
W. H. Polanski (Dresden/DE), H. Jiang (Dresden/DE; Beijing/CN)
M. Molcanyi (Cologne/DE), J. Zivcak (Kosice/SK), D. Ruess (Cologne/DE)
C. Reinshagen (Boston, MA/US), G. Schackert, B. Rieger (Dresden/DE)
Scientific programme • Thursday, April 27

11:20 Clinical and radiographic evaluation of bioactive glass in posterior cervical or lumbar spinal fusion
_C. Barrey (Bron/FR)_

11:25 Discussion

11:40 Lunch break and industrial exhibition

12:20–13:40 BioSpine session • New technologies in spine surgery
_Chairs_ P. D. Parchi (Pisa/IT), J. Seeger (Leipzig/DE)

12:20 **Invited talk**
Biomechanics analysis of functional spinal unit using imaging digital correlation
_C. Faldini (Bologna/IT)_

12:35 Discussion

12:40 **Best paper talk**
Aneurysmal bone cyst of the spine – an alternative treatment by direct injection of concentrated autologous mesenchymal stem cells
_G. Barbanti Brodano, M. Girolami, A. Cenacchi, A. Gasbarrini, S. Bandiera S. Terzi, R. Ghermandi, S. Boriani (Bologna/IT)_

12:55 Transformation of the nucleus pulposus into connective tissue – a novel method for partial immobilization of a spinal segment
_K. Olmarker, A. Lehmann (Gothenburg/SE)_

13:05 Clinical outcomes following laminoplasty in patients with cervical spondylotic myelopathy – focusing on delayed hinge fracture
_J. Kim, H. J. Moon, Y. K. Park (Seoul/KR)_

13:15 Novel implant for herniated disc repair: Technique and preclinical data
_R. Harrison (Toronto/CA)_

13:25 Discussion
Scientific programme • Thursday, April 27

13:40–15:10 BioSpine session • Disc degeneration
Chairs M. A. Tryfonidou (Utrecht/NL), C. Neidlinger-Wilke (Ulm/DE)

13:40 Invited talk
Evaluating new technologies and biomaterials for spine stabilization
L. Ferrara (Southport, NC/US)

13:55 Discussion

14:00 Best paper talk
026 Influence of notochordal cells on symptomatic intervertebral disc degeneration – anti-angiogenic capacity on human endothelial cell proliferation under hypoxia
J. Kim, W. K. Kwon (Seoul/KR)

14:15 Heterochronic parabiosis approach: Is it possible to interrupt the aging process of the intervertebral disc degeneration? – an in vivo experimental study
D. Colangelo, G. Autore, V. Pambianco, V. M. Formica, L. A. Nasto E. Pola (Rome/IT)

14:25 Electrospun collagen fabric in tissue engineering – scaffold to align, matrix to delineate, rat model

14:35 Gene array analysis of human native intervertebral disc tissue reveals novel markers to distinguish the phenotype of annulus fibrosus and nucleus pulposus cells

14:45 Establishment of a proinflammatory and degenerative intervertebral disc organ culture model
G. Lang (Davos/CH, Freiburg/DE, New York, NY/US), Y. Liu (Davos/CH, Freiburg/DE) Z. Zhou (Davos/CH), D. Kubosch (Freiburg/DE), N. Südkamp, R. G. Richards M. Alini, S. Grad, Z. Li (Davos/CH)

14:55 Discussion

15:10 Coffee break, poster and industrial exhibition
15:30–16:30 Debate session • Where disc regeneration research should go
Moderator J. D. Kang (Boston, MA/US)

Nucleus Pulposus: M. A. Tryfonidou (Utrecht/NL)
Annulus Fibrosus: S. Grad (Davos/CH)
End Plate: D. Samartzis (Hong Kong/CN)

16:30–17:30 Working group session
Chairs J. Clouet (Nantes/FR), K. Olmarker (Gothenburg/SE)

16:30 Disc degeneration: Regenerative treatment strategies in translation
M. A. Tryfonidou (Utrecht/NL)

16:45 Discussion

16:50 Recent advances of tissue engineering for annual repair in total disc replacement
R. Härtl (New York, NY/US)

17:05 Discussion

17:10 In vitro models for studying disc mechanobiology
C. Neidlinger-Wilke (Ulm/DE)

17:25 Discussion

17:30–18:05 Keynote session
Chair H. J. Meisel (Halle, Saale/DE)

17:30 BioSpine Asia 2018
Y. E. Cho (Seoul/KR)

17:40 Discussion

17:45 How does mechanical loading influence the failure of the disc?
H.-J. Wilke (Ulm/DE)

18:00 Discussion

19:30 Social Evening
Scientific programme • Friday, April 28

08:00–09:50 BioSpine session • Implants and navigation in spine surgery

*Chairs* G. Barbanti Brodano (Bologna/IT), P. J. Slosar (San Francisco, CA/US)

08:00 Chondrogenic microtissues: Possible applications in research and therapy
U. Anderer (Senftenberg/DE)

08:15 *Invited talk*
Spinal implant innovation in a challenging world – buzzwords and clinical reality
F. B. Christensen (Aarhus/DK)

08:30 Discussion

08:35 Early results for total posterior solution (TOPS) system in the management of lumbar spinal stenosis and degenerative spondylolisthesis
S. Haleem, S. Ganesan, S. F. McGillion, J. L. Fowler (Southampton/GB)

08:45 Allograft supplementation in intervertebral disc intervention
W. Weston (Marietta, GA/US), J. Dmochowski (Atlanta, GA/US)
S. Gonzalez, S. Namin (Marietta, GA/US)
D. Beall (Oklahoma City, OK/US), T. Ganey (Atlanta, GA/US)

08:55 Preoperative simulation software reduces surgical time, decreases radiation exposure and improves back pain in minimally invasive hybrid lumbar interbody fusion (MIS–HLIF)
W. H. Polanski (Dresden/DE), H. Jiang (Dresden/DE; Beijing/CN)
M. Molcanyi (Cologne/DE), J. Zivcak (Kosice/SK), D. Ruess (Cologne/DE)
C. Reinshagen (Boston, MA/US), G. Schackert, B. Rieger (Dresden/DE)

09:05 Pyogenic spondylodiscitis – epidemiology, diagnosis and treatment of 205 patients with two-year follow-up
E. Pola, G. Autore, V. Pambianco, V. M. Formica, D. Colangelo
L. A. Nasto (Rome/IT)

09:15 *Invited talk*
DegenPRO spine database – 1st evaluations
P. Hsieh (Los Angeles, CA/US)

09:30 Discussion

09:50 Coffee break, poster and industrial exhibition
10:05–11:05 Keynote session

Chair: J. Kim (Seoul/KR)

10:05 Spino-phenomics and its clinical relevance
D. Samartzis (Hong Kong/CN)

10:25 Discussion

10:35 Stem cell therapy for intervertebral disc degeneration
I. Han (Bundang/KR)

10:55 Discussion

11:05–12:15 BioSpine session • Imitating nature for new solution in spine surgery

Chairs: L. Ambrosio (Rome/IT), S. Wangler (Davos/CH)

11:05 Invited talk
Biological therapy for the degenerative disc: Biochemical, molecular and proteomic lessons from Mother Nature
M. Erwin (Toronto/CA)

11:15 Discussion

11:20 Invited talk
Neuro-skeletal network in physiological and pathological conditions
M. Lamghari (Porto/PT)

11:35 Discussion

11:40 Glycosaminoglycan derivatives – promising candidates for the design of functional biomaterials
D. Scharnweber, L. Hübner, S. Rother, U. Hempel, L. Hofbauer (Dresden/DE)
U. Anderegg (Leipzig/DE), S. A. Samsonov, M. T. Pisabarro (Dresden/DE)
M. Schnabelrauch (Jena/DE), S. Franz, J. Simon (Leipzig/DE)

11:50 Biomimetic and angio-regulatory biomaterials for intervertebral disc regeneration
M. Santin (Brighton/GB)

12:00 Discussion

12:15 Lunch break, poster and industrial exhibition
12:45–13:45 Working group session

**Chairs**
T. Ganey (Atlanta, GA/US), I. Han (Seongnam-si/KR)

12:45 What cells and materials could be used for intervertebral disc repair and which better not
_B. Gantenbein (Bern/CH)_

13:00 Discussion

13:05 Annulus fibrosus repair
_M. Alini (Davos/CH)_

13:20 Discussion

13:25 Autologous disc cell transplantation – evaluation of 15 years clinical application
_C. Hohaus (Dessau, Leipzig/DE)_

13:40 Discussion

13:45 Coffee break
14:00–16:30  NSpine symposium

Chair  
C. Hohaus (Dessau, Leipzig/DE)

14:00  Training fellows – surgical talent and practising on patients  
B. Boszczyk (Nottingham/GB)

14:20  Additive manufacturing technologies for medical devices  
P. Breedon (Nottingham/GB)

14:40  3D photography assessment of chest wall deformity in scoliosis surgery  
B. Boszczyk (Nottingham/GB)

15:00  Cooperative robotics – ‘the ScoliBOT’  
P. Breedon (Nottingham/GB)

15:20  Spinal surgery and sexual health – an overview of important implications  
B. Boszczyk (Nottingham/GB)

15:40  Augmented reality in the operating room – technology overview and potential usage  
B. Boszczyk (Nottingham/GB)

16:00  Discussion

16:30  Summary and farewell  
H. J. Meisel (Halle, Saale/DE), G. Vadalà (Rome/IT)
Poster exhibition

The poster session will not be chaired. However, the presenting author gets the chance to present his poster to an interested audience during the lunch and coffee breaks on Wednesday, April 26 and Friday, April 28, 2017.

P1 Early recognition and prompt management of infection after posterior spinal fixation and fusion – a retrospective study of seven cases
*M. Abdalla, H. Aboueleneein (Jeddah/SA), M. Elsanafiry (Mumbai/IN)*

P2 Will oligonucleotides supersede in the treatment modalities of intervertebral disc degeneration in the future?

P3 Percutaneous unilateral vertebral body augmentation using mesh-contained bone graft with percutaneous bilateral pedicle screw-rod fixation – a novel treatment in a patient with a thoracolumbar burst fracture
*T. Nguyen (Dearborn, MI/US)*

P4 MRI-informed biomimetic design of artificial intervertebral disc scaffolds using 3D bioplotting
*E. Hodder (Brighton/GB)*

P5 The first experience of MIS-TLIF using BMP-2 in Korea
*J. S. Kim, G. Lin, H. J. Cho (Seoul/KR)*

P6 Cervical device study (CDS) – Is adjacent level disease a device specific pattern or the natural course? – Introduction of biokinematic triangle
*W. H. Polanski (Dresden/DE), H. Jiang (Dresden/DE; Beijing/CN), M. Molcanyi (Cologne/DE), J. Zivcak (Kosice/DE), D. Ruess (Cologne/DE), C. Reinshagen (Boston, MA/US), G. Schackert, B. Rieger (Dresden/DE)*

P7 A four-electrode radiofrequency ablation system designed for more complex and tumor specific ablation patterns
*G. Ali, J. Krug, M. Friebe (Magdeburg/DE)*

P8 Is an effective functional replacement of a lumbar segment possible?: biokinematrie as a surgical projection
*B. Rieger, W. H. Polanski, G. Schackert, N. Welsch (Dresden/DE)*

P9 Gel sticks as a method of intradiscal augmentation
*S. Kananeh, A. Nabhan, M. Atallah (Riyadh/SA)*
P10 Evaluation the feasibility of the mesenchymal stem cells subsets toward nucleus pulposus-like cells
K. Jezierska-Wozniak, M. Barczewska, J. Wojtkiewicz, W. Maksymowicz (Olsztyn/PL)

P11 Abscess of cauda equina presenting as lumboischialgic pain – a case report
T. Velnar (Ljubljana/SI), G. Bunc (Maribor/SI)

P12 Microdiscectomy results with the Caspar technique
T. Velnar (Ljubljana/SI), G. Bunc, M. Vorsic (Maribor/SI)

P13 Extraspinal lumbar compression and sciatica due to a hidden pelvic expansion
T. Velnar (Ljubljana/SI), G. Bunc, M. Vorsic (Maribor/SI)

P14 Posterior decompression for lumbar stenosis – Is the instrumentation necessary?
T. Velnar (Ljubljana/SI), G. Bunc, M. Vorsic (Maribor/SI)

P15 Annulus fibrosus and nucleus pulposus cell isolation from human intervertebral disc
L. Gradisnik (Maribor/SI), T. Velnar (Ljubljana/SI)

P16 Isolated human intervertebral disc cells as a cell model for in vitro toxicology testing
T. Velnar (Ljubljana/SI), U. Maver, L. Gradisnik (Maribor/SI)

P17 Injectable cell-loaded microcapsules as a potential strategy for nucleus pulposus regeneration
J. Gansau, C. Buckley (Dublin/IE)

P18 Stress analysis of adjacent vertebrae and intervertebral discs before and after vertebroplasty
S. Ganesan, K. Anandan (Chennai/IN)

P19 Clinical and radiological outcome of modified mini open and open transforaminal lumbar interbody fusion – a comparative study
S. Ganesan, V. Jayabalahan, V. Kumar, K. Kailash (Chennai/IN)

P20 Diagnostic values of proset magnetic resonance coronal source imaging for detecting symptomatic lesion in multiple lumbar foraminal stenosis
I. Jeon, J. Lee (Daegu/KR)

P21 Designing a stand-alone dynamic implant for the spine
M. Moeini (Guildford/GB), I. Malik (London/GB)

P22 Clinical and radiologic results of minimally invasive-transforaminal lumbar interbody fusion using unilateral approach and single cage in patients over 65 years of age
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www.caos2017.de

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12th Annual Meeting of the German Spine Society
30 November–2 December 2017
International Congress Center Stuttgart
www.dwg-kongress.de
Social programme

Welcome reception
Right after the working group session, we would like to invite you to our welcome reception with some drinks and snacks.
Enjoy a networking evening in a relaxed atmosphere!

Date       Wednesday, April 26
Time       from 19:00
Location   Office Regenerate Europe e. V.
           Lietzenseeufer 10
           14057 Berlin
Fee        included for participants (registration is required)
           accompanying person 20 EUR

Individual arrival
Taxi no. +49 30 20 20 20

Social evening
The social evening will take place in the Soho House Berlin, that has a long and versatile history. Join us for a memorable evening in the former *Politisches Büro*, where the GDR Central Committee used to meet.
Follow the tracks from former GDR presidents Wilhelm Pieck and Walter Ulbricht and savour delicious meals, have a drink at the circular bar and enjoy the view from the balcony over the Berlin Mitte district accompanied the perfect musical framework created by CHAT NOIR.

Date       Thursday, April 27
Time       from 19:30
Location   Soho House Berlin
           Torstrasse 1
           10119 Berlin (DE)
Fee        75 EUR

Individual arrival
Taxi no. +49 30 20 20 20
Registration
Registration for the congress is required.

Registration fees
Regular  550 EUR
Postgraduate student*  410 EUR
Undergraduate student*  225 EUR

Welcome reception (April 26)
Participant  included
Accompanying person  20 EUR

Social evening (April 27)  75 EUR

* Please send a confirmation of your status either to registration@conventus.de Fax +49 3641 31 16-244 or by mail to Conventus GmbH indicating the keyword: BioSpine 2017 • Carl-Pulfrich-Strasse 1 • 07745 Jena (DE)

Certification
BioSpine 6 was granted 18 European CME credits (ECMEC) by the European Accreditation Council for Continuing Medical Education (EACCME).

Additionally, BioSpine 6 is certified by the medical chamber of Berlin as follows:
April 26  6 points  category B
April 27  6 points  category B
April 28  6 points  category B

Please remember to sign the list of attendants (with barcode, if required or applicable) at the check-in.

WiFi access
WiFi access is available free of charge in the Langenbeck-Virchow-Haus via a hotspot of Telekom Deutschland.

Media check-in
The media check-in is located directly in the plenary hall. To guarantee a smooth running programme please upload your presentation in due time – at least one hour before your presentation is due to start.
# Index of chairs, invited speakers and presenting authors

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