

## Program at a Glance

MONDAY JUNE 3	TUESDAY JUNE 4	WEDNESDAY JUNE 5	THURSDAY JUNE 6	FRIDAY JUNE 7
<b>07:00 - 08:00</b> Program Committee Meeting	<b>07:00-07:45</b> Breakfast	<b>07:00-07:45</b> Breakfast	<b>06:45-07:30</b> Breakfast	<b>07:00-07:45</b> Breakfast
<b>08:00 - 09:00</b> Membership Committee Meeting	<b>07:45-08:00</b> Welcome by local hosts and program chair	<b>07:45-08:45</b> Special poster session 1A-1E	<b>07:30 - 09:30</b> Scientific	<b>07:45-08:45</b> Special Poster Session 2F-2J
<b>09:00 - 12:00</b> Focus Group #1	<b>08:00-09:00</b> Scientific	<b>09:00-10:00</b> Scientific	<b>09:30-10:00</b> Fellowships and Awards	<b>09:00-09:10</b> Report from Focus Groups
<b>9:30 - 11:30</b> Strategy Group Meeting	<b>10:00-10:30</b> COFFEE	<b>10:00-10:30</b> COFFEE	<b>10:00-10:20</b> COFFEE	<b>09:10-09:40</b> Scientific
<b>12:00-15:00</b> ExCom Meeting	<b>10:30-11:30</b> Scientific	<b>10:30-11:00</b> Scientific	<b>10:20-11:30</b> The ISSLS Prize	<b>09:40-10:10</b> COFFEE
<b>13:00-16:00</b> Focus Group #2	<b>11:30-12:15</b> Debate	<b>11:00-11:40</b> Presidential address	<b>11:30-12:20</b> Invited lecture Prof. Osamu Honmou	<b>10:10-12:10</b> Scientific
<b>16:30-</b> Registration opens	<b>12:15-13:30</b> LUNCH	<b>11:40-12:20</b> Harry Farfan Presidential Lecture	<b>12:20-13:30</b> LUNCH	<b>12:10-12:20</b> Closing remarks
<b>17:00-18:00</b> Women's ISSLS	<b>13:30-15:00</b> Best Paper Award Session	Dr Eric Grant	<b>13:30-14:30</b> Scientific	Meeting adjourned
<b>18:00-20:00</b> Welcome Reception	<b>15:00-15:30</b> COFFEE	<b>12:30</b> Afternoon outing	<b>14:30-15:30</b> General poster session	
	<b>15:30-16:30</b> Scientific		<b>15:30-16:30</b> Scientific	
	<b>16:30-17:10</b> Symposium		<b>16:30-17:30</b> Debate	
	<b>17:10-18:10</b> First Business Meeting		<b>17:30-18:00</b> Second Business Meeting	
			<b>19:00-21:00</b> Dinner Banquet	

# WELCOME TO KYOTO

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Dear Members and Guests,

It is our great honour to welcome you on behalf of the Local Organizing Committee to the 46<sup>th</sup> Annual Meeting of the International Society for the Study of the Lumbar Spine (ISSLS) in Kyoto, Japan. ISSLS' Annual Meeting was first held in Japan in 1989. Thirty years on, we are excited to once again host the Meeting, this time in Kyoto.

With over 1,200 years of history, Kyoto boasts wonderful historic scenery along with traditional architecture and beautiful nature. At the same time, Kyoto is a city of learning and creation with cutting edge universities, research institutions and companies. This harmony of preserving tradition while continually innovating is a uniquely attractive feature of Kyoto. Kyoto has 17 UNESCO World Heritage Sites and over 2,000 temples and shrines. The history of harmony that has been built in Kyoto over the centuries has created a culture of hospitality that can be experienced not only at our meeting facilities and accommodation but also throughout the city.

Our half-day outing for everyone will take us to Kinkaku-ji Temple (Golden Pavilion), Ryoan-ji Temple, and Nijo-jo Castle, all three of which are World Heritage Sites. Kinkaku-ji Temple is richly adorned in gold leaf and reflects beautifully in the water and it is best seen reflected in the adjoining "mirror pond". In contrast to Kinkaku-ji Temple, Ryoan-ji Temple is simple and renowned for its mysterious rock garden. Try to find fifteen rocks in the garden at Ryoan-ji Temple from any single vantage point. At Nijo-jo Castle, walk down the "Nightingale Hallway" and notice the birds singing, a feature uniquely designed to detect intruders walking the halls. At the end of the tour, take in the graceful ambience of a traditional Japanese house while enjoying a dinner of Italian cuisine at Sodoh Higashiyama Kyoto. We also offer two accompanying persons' tours, which will include the most popular places and a full course lunch. For the Banquet, we promise a fantastic display of Japanese culture, an experience not to be missed. Be sure to arrive on time for both the Opening Ceremony and the Banquet.

The meeting venue, Kyoto Hotel Okura, is located downtown and is convenient to access anywhere in Kyoto city. For the scientific program, there has been a record number of abstracts submitted this year and the program committee members chose oral and poster presentations according to peer review. In addition, they have arranged a wonderful program with special lectures and a symposium for the latest and greatest topics. We hope this meeting will be memorable for you all.

We are looking forward to meeting you at the 46<sup>th</sup> Annual Meeting of ISSLS in Kyoto.

Sincerely,  
Shin-ichi Konno & Miho Sekiguchi  
(Local hosts)

## WI-FI AND SOCIAL MEDIA

Wi-Fi and Log-in: To be advised at venue

Twitter: [https://twitter.com/ISSLS\\_Society](https://twitter.com/ISSLS_Society)

Instagram: @ISSLS\_2019 (ISSLS Kyoto 2019)

Hashtag for conference: #issls2019

# MESSAGE FROM THE PRESIDENT

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**Dear friends and colleagues,**

On behalf of the ISSLS Executive Committee, welcome to Kyoto! Our 46th Annual Meeting is being hosted in Japan for the second time, with the previous meeting also held in Kyoto, 30 years ago! The former capital of Japan, Kyoto is of great historical and cultural importance, with a dazzling array of things to do and see, including 17 UNESCO World Heritage Sites!

Our local hosts, Drs. Miho Sekiguchi and Shinichi Konno, and the local organizing committee have worked diligently to plan our time in Kyoto. The Program Committee, under the leadership of Dr Scott Blumenthal, has assembled a high-quality and interesting program of scientific presentations, debates, and symposia. For the first time, we will have a podium session highlighting the highest-scoring abstracts submitted to this meeting. As always, we look forward to active and vigorous discussions!

The Award Ceremony on June 6th will honor one of our most respected senior members with the Wiltse Lifetime Achievement Award. The prestigious ISSLS Prizes will be presented at a special session on the same day. We have two invited lectures. Dr. Eric Grant from the Radiation Effects Research Foundation will deliver the Harry Farfan Presidential Lecture on June 5th and Professor Osamu Honmou from Sapporo Medical University will be our guest for a lecture on cell transplantation on June 6th.

The traditional ISSLS outing will allow us to explore some of the classic sites of Kyoto, including the Ryoan-ji Temple, the Kinkaku-ji Temple, and the Nijo-jo Castle. We will conclude at Sodoh Higashiyama for something to eat and refreshments. The Accompanying Person's program covers other great sites in and around Kyoto.

At the conclusion of the ISSLS program, a half-day symposium will be held, titled the Mechanism of Low Back Pain - Recent Advancement. I encourage you all to stay for what promises to be an informative session on a most relevant topic.

I look forward to seeing you all in Kyoto.

*Tom Oxland*  
President ISSLS 2018-2019

## UPCOMING MEETINGS

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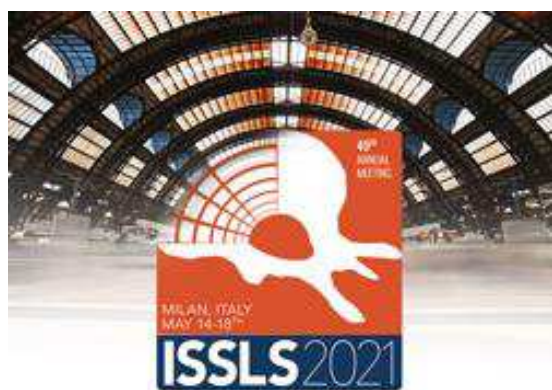


### **2020 Annual meeting combined with SpineweeK, Melbourne, Australia**

April 27 - May 1, 2020

Local hosts: Robert Gunzburg

**Deadline for abstracts: October 15, 2019 (please note early deadline)**



### **2021 Annual meeting in Milan, Italy**

May 31- June 4, 2021

Local hosts: Stefano Boriani and Fabio Zaina

Deadline for abstracts: November 15, 2020

### **2022 Annual meeting in North America**

To be decided on at the Second Business meeting in Kyoto, Japan. One site proposal has been received:

- Boston - local hosts James Kang and Andrew Schoenfeld

# FELLOWSHIPS AND AWARDS

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## YOUNG INVESTIGATOR TRAVEL AWARD

Sponsored by Eisai Co.

Prize Ceremony for Recipients

Fellowship Award Ceremony

Thursday June 6 at 09:30

## CLINICAL TRAVELLING FELLOWSHIP

Sponsored by Seoul Chuk Hospital

Announcement of this year's recipient

Report from last year's recipient: Xialong Chen, China

Fellowship Award Ceremony

Thursday June 6 at 09:30

## ISSLS RESEARCH GRANT

Sponsored by Taisho Pharmaceutical Co.

Announcement of this year's recipient

Report from last year's winner: Hugo Massé-Alarie

Fellowship Award Ceremony

Thursday June 6 at 09:30

## WILTSE LIFETIME ACHIEVEMENT AWARD CEREMONY

An annual award for exceptional achievement in the spinal field.

Announcement of this year's winner

Winner from 2017: Robert Fraser

Fellowship Award Ceremony

Thursday June 6 at 09:30

## THE ISSLS PRIZE FOR LUMBAR SPINE RESEARCH

Sponsored by European Spine Journal

Announcement of this year's recipients

The prize-winning papers will be presented on Thursday, June 6 at 10:20

## BEST PAPER AND POSTER AWARD

A special best paper award session with selected papers will be presented and judged by the Program Committee on Tuesday June 4 at 13:30

# SOCIAL PROGRAM

(Included in registration fee for all fully registered delegates/accompanying persons. Additional tickets may be purchased at the registration desk, pending availability)



## WELCOME RECEPTION - Monday June 3 - 18:00 – 20:00

Kyoto Hotel Okura, 4F, Gyoun Hall

Dress Code: Smart Casual

Please be sure to arrive on time as there will be an exclusive performance by world-renowned opera singer *Michié Nakamaru* on stage.

## AFTERNOON OUTING – Wednesday June 5 from 12:30

### Ryoan-ji Temple



Japan's most famous "hiraniwa" (flat garden void of hills or ponds), reveals the stunning simplicity and harmony of the Principles of Zen meditation. Ryoan-ji Temple is famous for its mysterious rock garden, the most celebrated in Japan, which defies attempts at explanation. Enclosed by an earthen wall, fifteen carefully placed rocks seem to drift in a sea of raked white gravel. A viewing platform right above the garden gives visitors an unimpeded view, although from whatever angle you view the garden, you can never see all fifteen stones.

After pondering the garden's "sermon in stone", you can stretch your legs with a tour of the extensive grounds of Ryoan-ji Temple, which includes larger gardens with trees and moss and the Kyoyo-chi pond, which is particularly striking in autumn.

### Kinkaku-ji Temple

The image of the temple richly adorned in gold leaf reflects beautifully in the water of Kyokochi, the mirror pond. It is perhaps the most widely-recognized image of Kyoto.

Seen reflected in the adjoining "mirror pond" with its small islands of rock and pine, Kinkaku-ji Temple, "The Golden Pavilion" is a breathtaking must-see.

The building's first purpose was to serve the retiring Shogun Ashikaga Yoshimitsu (1358-1409) as a residence. The gold-leaf-adorned building was converted into a Zen temple shortly after his death. In an event that was later fictionalized by the renowned author Yukio Mishima, a 21-year-old monk burned Kinkaku-ji Temple down in 1950. The temple was rebuilt in 1955 and continues to function as a storehouse of sacred relics.

### Nijo-jo Castle



The gorgeous style of this castle was intended as a demonstration of Shogun Tokugawa Ieyasu's (1542-1616) prestige.

Nijo-jo Castle was the residence of the Tokugawa Shoguns in Kyoto, who ruled Japan for over 260 years from 1603 to 1868. It remains an eloquent testimony to their power. The wide moat, massive stone walls, and heavy yet elaborate gates are still impressive and were the only fortifications the inhabitants felt necessary, so firm was their grip on power.

The grounds are large and contain several lovely gardens as well as groves of plum and cherry trees. The palace building itself is imposing, yet upon closer examination, is rich in decorative detail.

### The Sodoh Higashiyama, Kyoto



An Italian restaurant at the foot of the Tower of Yasaka, the symbol of Kyoto. You will enjoy the ambience of this graceful Japanese house, with its 46,800ft<sup>2</sup> (4,300m<sup>2</sup>) of gardens that reflect the colours of the four seasons.

## GALA DINNER - Thursday June 6 at 19:00

Kyoto Hotel Okura 3F Suiun

Dress Code: Smart Casual



At the start of the Banquet, Geiko will arrive and there will be a traditional performance on stage. Please arrive at 18:50 to be seated before the performance.

During the performance, please remain seated and do not move around the banquet hall. After the performance, she will come to each table to serve drinks and there will be a photo opportunity with her. The Banquet will be an extraordinary event and experience of traditional Japanese culture. Please enjoy the dinner with a selection of wine.

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## ACCOMPANYING PERSONS PROGRAM

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Tuesday June 4 - Bus departs at 09:00 (7-8 hours)

Japanese Lunch at Suiran

*\*Wear comfortable clothing and walking shoes as this tours will be on foot.*

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### Arashiyama & Sagano Bamboo Grove

Arashiyama is one of most popular sightseeing districts in Kyoto. It is a great escape from the city. You will enjoy walking through the beautiful Sagano Bamboo Forest pathway, where there are plenty of opportunities to take photos.

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### Tenryu-ji Temple

Tenryu-ji temple, registered as a UNESCO World Heritage site, was ranked first among the city's five great Zen temples. The main attraction of Tenryu-ji Temple is the zen garden, which was created by the famous garden designer Muso Soseki in the 14th century.

After sightseeing and lunch, you can experience Kyoto cultures and traditional arts through crafting at Kyoto Handcraft Center. Your hand-made items will be the best souvenirs.

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### Folding Fan Painting

Enjoy the experience of making Japanese handcraft!

You will paint on an unfolded fan as you like.

When it is dry, it will be fastened at the end with a catch.

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Thursday June 6 - Bus departs at 09:00 (6 hours)

French Lunch at Funatsuru

*\*Wear comfortable clothing and walking shoes as there will be 1½ hours of walking*

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### Fushimi Inari Shrine

Fushimi Inari Shrine is a Shinto shrine, which was voted Kyoto's top tourist destination by foreign visitors. Inari is the Shinto God of Rice.

Thousands of red torii (shrine gates) straddle a network of trails behind its main buildings. At the entrance stands the Romon Gate, donated in 1589.

Behind that is the shrine's main hall (honden). Individuals and companies have been donating torii for around 400 years. These symbolize prosperity and profitability. You will find the names of the donors inscribed on the back of each gate.



### Tofukuji Temple

Tofukuji is a large Zen temple, founded in 1236 by the Fujiwara clan. There are unique gardens surrounding the building on all sides, with particularly beautiful views from the Tsutenkyo Bridge. The 22m tall Sanmon Gate is the oldest Zen gate of its kind, dating back to 1425.

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### Sanjusangendo

After lunch, we will visit Sanjusangendo, which was originally built in 1164. The original temple building was lost to fire, but reconstructed in 1266. Measuring 120m, the temple hall is Japan's longest wooden structure. The building houses 1,001 wooden statues of Kannon (the thousand-armed Goddess of Mercy).

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# HARRY FARFAN PRESIDENTIAL LECTURE

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## DR ERIC GRANT

### Health effects of ionizing radiation exposure - what we've learned from the atomic bomb survivors

**Eric Grant** is the Associate Chief of Research at the Radiation Effects Research Foundation (RERF) in Hiroshima and Nagasaki, Japan. Dr Grant received his BSEE from the University of Michigan and his PhD in Epidemiology from the University of Washington. Eric worked as a computer programmer and a biomedical engineer prior to working for RERF.

RERF's mission is to study the long-term health effects due to exposure to ionizing radiation from the atomic bombings. Dr Grant's recent publication focused on the radiation risks of solid cancer incidence



among the Life Span Study of atomic bomb survivors. Dr Grant has also authored manuscripts on indirect effects of radiation exposure, specifically hormonal changes among women after whole-body exposure, and on the lack of evidence of trans-generational mortality effects of radiation exposure among the children of the atomic bomb survivors.

Dr Grant has recently been put in charge of developing RERF's "Research Resource Center", an institutional repository designed to safeguard RERF's varied resources (data, paper, physical artifacts, etc.) as well as integrate research data with biosample inventories. This integrated resource center along with updated policies for data sharing should facilitate RERF's own research as well as improve opportunities for collaborative research in the future.

## INVITED SPEAKER

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## PROFESSOR OSAMU HONMOU

### Cell therapy for spinal cord injury



**Dr. Osamu Honmou, M.D., Ph.D.** is the chairman and Professor in the Department of Neural Regenerative Medicine at Sapporo Medical University School of Medicine in Japan. He received his M.D. from Sapporo Medical University in 1989 and obtained his Ph.D. in Medicine from the same institution in 1999. After completing his neurosurgical residency at Sapporo Medical University Hospital, he moved to New York University Medical Center in the U.S. in 1991, where he first studied basic neuroscience. He then moved to Yale University in 1992 and began working on projects in the field of neural regeneration. He has served as a Lecturer in Neurology at Yale University School of Medicine since 1995.

He returned to Sapporo Medical University in 1995 as an Assistant Professor in the Department of Neurosurgery and launched a neuroscience and regeneration research laboratory. He conducted a pilot clinical study on autologous mesenchymal stem cells derived from bone marrow for stroke patients in 2006-2007. He became a Professor in the Department of Neural Repair and Therapeutics in 2008 and was appointed as the chairman of and Professor in the Department of Neural Regenerative Medicine at Sapporo Medical University in 2011. He is a board-certified neurosurgeon in Japan and also holds a Visiting Assistant Professorship in the Department of Neurology at Yale University School of Medicine.

Currently, he is leading a team that is conducting a phase III, double-blinded, placebo-controlled, randomized clinical trial in patients with stroke that started in 2013. He also launched a clinical trial of intravenous administration of autologous mesenchymal stem cells in patients with spinal cord injury at Sapporo Medical University in 2013. His professional specialties are central nervous system diseases and his main research objectives are to pursue a better understanding of these diseases at a fundamental level and to develop regenerative therapies with innovative approaches.



## MONDAY JUNE 3

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- 07:00 – 08:00 **Program Committee Meeting** (*Program Committee only*)  
*Chair: Scott Blumenthal*  
Location: Edinburgh (3F)
- 08:00 – 09:00 **Membership Committee Meeting** (*Membership Committee only*)  
*Chair: Daisuke Sakai*  
Location: Edinburgh (3F)
- 09:00 – 12:00 **Focus Group #1 - Degenerative Spinal Phenotypes - Creating a common language to advance knowledge**  
*Chairpersons: Michele Battié, Dino Samartzis, Josef Assheuer & Bradley Weiner*  
Location: Kobu (3F)
- 09:30 – 11:30 **Strategy Group**  
*Chair: Keith DK Luk*  
Location: Edinburgh (3F)
- 12:00 – 15:00 **Executive Committee Meeting**  
*Chair: Tom Oxland*  
Location: Edinburgh (3F)
- 13:00 – 16:00 **Focus Group #2 – International Taskforce on Diagnosis and Management of Lumbar Spinal Stenosis**  
*Chairpersons: Christy Tomkins-Lane , Markus Melloh & Arnold Wong*  
Location: Kobu (3F)
- 17:00 – 18:00 **Women’s ISSLS**  
*Chair: Jeannie Bailey*  
Location: Kobu (3F)
- 18:00 – 20:00 **Opening Ceremony & Welcome Reception**  
Location: Gyoung (Central and South (4F))

## TUESDAY JUNE 4

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07:00-07:45	<b>Breakfast</b> Location: Banquet Lobby in front of Gyoun (4F)
07:45-07:50 07:50-08:00	<b>WELCOME</b> <b>Local Hosts: Shin-ichi Konno &amp; Miho Sekiguchi</b> <b>Program Chair: Scott Blumenthal</b> Location: Gyoun (Central and South) (4F)
08:00-09:00	<b>SESSION #1 STENOSIS</b> <i>Chairs: Tom Oxland &amp; Kazuhiro Chiba</i>
08:00-08:05	1 Multi-level decompression/fusions are as effective as single level lumbar spinal stenosis operations. <i>Charles G Fisher, P.K. Louie, B.A. Basques, J.M. Khan, M.T. Nolte, J.C. Paul, A.G. Varthi, E.J. Goldberg, H.S. An, Canada</i>
08:07-08:12	2 Does the Concomitant Presence of Lumbar Scoliosis or Spondylolisthesis Affect Clinical Outcomes Following Decompression Surgery in Patients with Spinal Stenosis? <i>Dino Samartzis, H. Ahn, H. Hall, G. McIntosh, E. Abraham, A. Soroceanu, J. Paquet, Y.R. Rampersaud, M. Johnson, C.S. Bailey, A. Nataraj, G. Hogan, P. Jarzem, R.A. Glennie, E. Wai, P. Phan, A. Yee, K. Thomas, N. Manson, USA</i>
08:14-08:19	3 Early Surgery vs Prolonged Conservative Treatment for Sciatica-10-year results of a Randomized Controlled Trial. <i>Gijsbert M Overvest, W.C. Peul, W.A. Moojen, B. Koes, R.H. Bartels, The Netherlands</i>
08:21-08:26	4 Mood disorders predict poor outcome of lumbar disc surgery - results from a clinical trial. <i>Gijsbert M Overvest, N.A. van der Gaag, W.M. Moojen, W. Peul, M.P. Arts, The Netherlands</i>
08:28-08:33	5 The indirect decompression effect of oblique lateral interbody fusion in the treatment of degenerative lumbar stenosis. <i>Zhi-Jun Hu, X. Fang, F. Zhao, J. Zhang, X. Zhao, S. Fan, China</i>
08:35-08:40	6 Efficacy of decompression surgery on walking ability and health-related quality of life in lumbar spinal stenosis patients with gluteus medius muscle weakness. <i>Satoshi Suzuki, N. Fujita, A. Miyamoto, O. Tsuji, N. Nagoshi, E. Okada, M. Yagi, T. Tsuji, H. Kono, M. Nakamura, M. Matsumoto, K. Watanabe, Japan</i>
08:42-09:00	<b>Discussion</b>
09:00 – 10:00	<b>SESSION #2 DISC DEGENERATION</b> <i>Chairs: Ashish Diwan &amp; Sumihisa Orita</i>
09:00-09:05	7 Nucleus pulposus-derived stem cells encapsulated in BMP7-based functionalized self-assembling peptide for alleviation of intervertebral disc degeneration in a rabbit model. <i>Dike Ruan, J. Ying, L. Su, S. Pei, T. Wen, China</i>
09:07-09:12	8 Expression of TRPV4 in human IVDs and its relevance in stretch-induced inflammation. <i>Karin Wuertz-Kozak, E. Cambria, A. Sadowska, L. Halgund, P. Jaszczuk, F. Passini, W. Hitzl, J. Snedeker, O.N. Hausmann, Switzerland</i>
09:14-09:19	9 Pathological effects of cortisol on intervertebral disc cells and mesenchymal stem cells from low back pain patients. <i>Daphne Hingert, J. Nilsson, H. Barreto Henriksson, A. Baranto, H. Brisby, Sweden</i>
09:21-09:26	10 Genetic lineage tracing of intervertebral disc cells in a neonatal regeneration model. <i>James C Iatridis, O. Torre, V. Mroz, A.R. Martinez Benitez, A.H. Huang, USA</i>
09:28-09:33	11 A new rabbit model of intervertebral disc degeneration induced by intradiscal injection of monosodium iodoacetate. <i>Takao Sudo, H.H. Cherif, D.D. Bisson, S.S. Kocabas, Japan</i>
09:35-09:40	12 Identification of two natural compounds as new senolytics in intervertebral disc degeneration and back pain. <i>Lisbet L.H. Haglund, N.A. van der Gaag, W.M. Moojen, W. Peul, M.P. Arts, Canada</i>
09:42-10:00	<b>Discussion</b>
10:00-10:30	<b>Coffee</b> Location: Banquet Lobby in front of Gyoun (4F)

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## TUESDAY JUNE 4 (Continued)

<b>10:30-11:30</b>	<b>SESSION #3 REHABILITATION</b> <i>Chair: Jeremy Fairbank &amp; Margareta Nordin</i>	
10:30-10:35	13	Identification through movement analysis of chronic low back pain pathological spinal movements patterns and their sensibility to change during exercise treatment. <i>Stefano Negrini, B. Piovanelli, C. Amici, S. Donzelli, F. Zaina, Italy</i>
10:37-10:42	14	Male gender and initial job demand predicts successful re-integration and return to work: results from 20-years of Experience with a Multidisciplinary Programme for Rehabilitation of Chronic Low Back Pain. <i>Jason Pui Yin Cheung, G. Leung, P. Cheung, G. Lau, S. Lau, K. Luk, Y. Wong, K. Cheung, P. Koljonen, Hong Kong</i>
10:44-10:49	15	Exercise for the intervertebral disc: a 6-month RCT. <i>Daniel L Belavy, C. Miller, A. Hahne, S. Tagliaferri, K. Simson, D. Connell, G. Trudel, T. Rantalainen, J. Ford, Australia</i>
10:51-10:56	16	Can Preoperative Rehabilitation Improve the Surgical Outcome in the Patients with Adult Spinal Deformity? A retrospective cohort study. <i>Tatsuya Endo, T. Ito, M. Iwabuchi, O. Shirado, Japan</i>
10:58-11:03	17	What factors differ between individuals with either good or poor outcome following microdiscectomy for lumbar disc herniation: an investigation of inflammatory and muscle regeneration markers in the lumbar multifidus muscle. <i>Xiaolong Chen, P. Hodges, G. James, J. Umali, U. Chamoli, K. Sheldrick, J. TU, W. Li, A. Diwan, Australia</i>
11:05-11:10	18	The tasks effect in low back pain movement patterns. <i>Enrica Papi, A.M. Bull, A.H. McGregor, United Kingdom</i>
11:10-11:30	<b>Discussion</b>	
11:30-12:15	<b>DEBATE - Prehabilitation and post-operative rehabilitation: What do we really know? A debate built on the ISSLS memberships' knowledge</b> <i>Chairs: Helena Brisby, Kristin Archer &amp; Marin Lundberg</i>	
12:15-13:30	<b>Lunch</b> Location: Suiun (3F)	
<b>13:30-15:00</b>	<b>SESSION #4 BEST PAPER AWARD SESSION</b> <i>Chairs: Scott Blumenthal, Dino Samartzis &amp; Seiji Ohtori</i>	
13:30-13:35	19	In vitro biomechanical testing of an innovative antero-posterior fixation for A3 lumbar fracture. <i>Marc-Antoine Rousseau, L. Simon, S. Persohn, A. Nerot, W. Skalli, France</i>
13:37-13:42	20	Enhanced spinal fusion by combination of NELL-1 and ultra-low dose of BMP-2 in a rat model. <i>Wing Moon Raymond Lam, L. Liu, M. Wang, R. Kumarsing, M. Naidu, K. Ting, C. Goh, H. Wong, Singapore</i>
13:44-13:49	21	Remaining systemic treatment options: a valuable predictor of survival and functional outcomes after surgical treatment for spinal metastasis. <i>Sam Yeol Chang, H. Kim, C. Lee, B. Chang, South Korea</i>
13:51-13:56	22	Cervical Epidural Steroid Injections: Incidence and Determinants of Subsequent Surgery <i>John P Kleimeyer, J.C. Koltsov, S.S. Hu, USA</i>
13:58-14:03	23	A Study on Sports Activities of Non-union Adolescent Lumbar Spondylolysis Patients <i>Kenji Hatakeyama, M. Urushibara, A. Kojima, J. Ouchi, S. Ohtori, Japan</i>
14:05-14:10	24	Quantitative evaluation of motor function of the lower extremity using the foot tapping test: Part 2. Five-year follow-up. <i>Hiroshi Kobayashi, K. Otani, T. Nikaido, K. Watanabe, K. Kato, S. Yabuki, S. Kikuchi, S. Konno</i>
14:12-14:17	25	Is the terminal complement complex a possible target for therapeutic intervention in intervertebral disc degeneration? <i>Graciosa Q Teixeira, S. Munir, M.B. Freidin, J.H. Määttä, G. Livshits, F.M. Williams, Germany</i>

## TUESDAY JUNE 4 (Continued)

14:19-14:24	26	Endplate damage is heritable, is independently associated with low back pain and may trigger intervertebral disc degeneration: a longitudinal study from TwinsUK. <i>Marinko Rade, S. Munir, M.B. Freidin, J.H. Määttä, G. Livshits, F.M. Williams, United Kingdom</i>
14:26-14:31	27	Causes of low back pain in different populations –The Wakayama Spine Study. <i>Hiroshi Hashizume, H. Yamada, H. Oka, S. Tsutsui, M. Teraguchi, Y. Ishimoto, K. Nagata, T. Sasaki, H. Iwahashi, Y. Asai, K. Matsudaira, S. Tanaka, N. Yoshimura, M. Yoshida, Japan</i>
14:31-15:00		<b>Discussion</b>
<b>15:00-15:30</b>		<b>Coffee</b> Location: Banquet Lobby in front of Gyoum (4F)
<b>15:30-16:30</b>		<b>SESSION #5 AGING SPINE</b> <i>Chairs: Anne F Mannion &amp; Hirotaka Haro</i>
15:30-15:35	28	Cost-effectiveness of balloon kyphoplasty for patients with acute osteoporotic vertebral fractures in a super-aging society. <i>Shinji Takahashi, M. Hoshino, H. Yasuda, Y. Hori, S. Ohyama, H. Terai, T. Tsujio, H. Toyoda, A. Suzuki, K. Tamai, R. Sasaoka, H. Nakamura, Japan</i>
15:37-15:42	29	Teriparatide Neoadjuvant Therapy Targeting the Osteoporotic Spine: Influence of Administration Period from the Perspective of Bone Histomorphometry. <i>Kimihiko Sawakami, K. Watanabe, N. Yamamoto, K. Hasegawa, T. Shimakura, M. Yahata, K. Minato, S. Ishikawa, T. Hirano, H. Takahashi, N. Endo, Japan</i>
15:44-15:49	30	Do osteoporosis and spinal degenerative disorders affect low back pain and related disorders? The Wakayama Spine Study <i>Shoei Iwata, H. Hashizume, N. Yoshimura, H. Oka, H. Iwahashi, Y. Ishimoto, K. Nagata, M. Teraguchi, R. Kagotani, T. Sasaki, A. Minamide, Y. Nakagawa, Y. Yukawa, S. Tanaka, M. Yoshida, H. Yamada, Japan</i>
15:51-15:56	31	Local mechanical environment plays a role in spinal bone mineral density measured by quantitative computed tomography: A study on lumbar lordosis. <i>Alexander P Hughes, I. Okano, B.B. Carlson, F. Winter, S.N. Salzmann, T. Shirahata, C. Ortiz Miller, C. Rentenberger, J. Shue, J.A. Carrino, A.A. Sama, F.P. Cammisa, F.P. Girardi, USA</i>
15:58-16:03	32	An Effect Comparison of Denosumab and SERM on Spinal Instrumentation in Patients with Osteoporosis. <i>Koji Ishikawa, Y. Kudo, S. Tani, A. Matsuoka, H. Mauyama, H. Emori, R. Yamamura, C. Hayakawa, M. Sekimizu, K. Tsuchiya, Y. Dodo, K. Shiga, Y. Oshita, T. Ozawa, T. Shirahata, K. Inagaki, K. Kanzaki, T. Toyone, Japan</i>
16:05-16:10	33	Clinical and radiological impact of adjacent vertebral fracture after balloon kyphoplasty: Development of a scoring system for predicting adjacent vertebral fracture occurrence <i>Shinji Takahashi, M. Hoshino, Y. Hori, H. Yasuda, S. Ohyama, H. Terai, T. Tsujio, A. Suzuki, H. Toyoda, K. Tamai, S. Dohzono, H. Nakamura, Japan</i>
16:10-16:30		<b>Discussion</b>
<b>SYMPOSIUM - AGING SPINE: TOWARD A COMPREHENSIVE UNDERSTANDING OF LOW BACK PAIN IN THE ELDERLY</b>		
<i>Chair: Hans-Joachim Wilke &amp; Hiroaki Nakamura</i>		
16:30-17:10		The Patho-mechanism of Pain due to Aging Intervertebral Disc and Muscle <b>Masayuki Miyagi</b> , M.D., Ph.D, Department of Orthopaedic Surgery, Kitasato University, School of Medicine From Bench to Bedside: The Osteoporosis-Related Pain. <b>Miyako Suzuki</b> , M.D., Ph.D, Department of Orthopaedic Surgery, Graduate School of Medicine, Chiba University Aging Spine and Low Back Pain: Analysis of Cohort Studies <b>Shinji Takahashi</b> , M.D., Ph.D, Department of Orthopaedic Surgery, Osaka City University Graduate School of Medicine <b>Discussion</b>
17:10-18:10		<b>First Business Meeting (For members only)</b> <i>Chair: Tom Oxland</i>

## WEDNESDAY JUNE 5

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07:00-07:45	<b>Breakfast</b> Location: Banquet Lobby in front of Gyoun (4F)
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07:45-08:45	<b>SPECIAL POSTER SESSION #1A: BIOLOGY</b> <i>Chairs: Helena Brisby &amp; Gen Inoue</i> Location: Small Banquet Hall – Kame (5F)
	<b>SPECIAL POSTER SESSION #1B: BIOMECHANICS</b> <i>Chairs: Fabio Galbusera &amp; Osamu Shirado</i> Location: Small Banquet Hall – Tsuru (5F)
	<b>SPECIAL POSTER SESSION #1C: REHABILITATION</b> <i>Chairs: Jiri Dvorak &amp; Hiroshi Hashizume</i> Location: Small Banquet Hall – Ume (5F)
	<b>SPECIAL POSTER SESSION #1D: DEFORMITY</b> <i>Chairs: Jason Pui Yin Cheung &amp; Daisuke Togawa</i> Location: Small Banquet Hall – Take (5F)
	<b>SPECIAL POSTER SESSION #1E: SURGERY OUTCOMES</b> <i>Chairs: Christopher Bono &amp; Kazuhiro Hasegawa</i> Location: Small Banquet Hall – Matsu (5F)

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09:00-10:00	<b>SESSION #6 POPULATION STUDIES</b> <i>Chairs: Björn Strömqvist &amp; Masatoshi Teraguchi</i>
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09:00-09:05	34 Factors related to low back pain among elderly population in suburban area Japan - The Shiraniwa Study. <i>Shoichiro Ohyama, M. Hoshino, S. Takahashi, Y. Hori, T. Tsujio, H. Nakamura, Japan</i>
09:07-09:12	35 Pelvic compensation accompanying spinal malalignment and back pain-related factors - The Wakayama Spine Study. <i>Hiroshi Hashizume, H. Yamada, H. Oka, S. Tsutsui, M. Teraguchi, Y. Ishimoto, K. Nagata, T. Sasaki, H. Iwahashi, M. Okada, M. Takami, H. Iwasaki, A. Minamide, Y. Yukawa, N. Yoshimura, M. Yoshida, Japan</i>
09:14-09:19	36 Association of vertebral bone marrow edema with low back pain in degenerative lumbar scoliosis in the elderly. <i>Toshio Nakamae, Y. Fujimoto, K. Yamada, K. Nakanishi, N. Kamei, Y. Tsuchikawa, T. Morisako, T. Harada, N. Adachi</i>
09:21-09:26	37 Lifestyle and lifetime occupational exposures may not play a role in the pathogenesis of Modic Changes on the lumbar spine MRIs. <i>Jialong Wu, J. Huang, M.C. Battié, Y. Wang, China</i>
09:28-09:33	38 Results of conservative protocol in management of 403 patients of Lumbar Disc Herniation: Are we operating more than we should? <i>Harvinder Chhabra, A. Pedaballe, M. Gupta, India</i>
09:35-09:40	39 Range of motion and local sagittal alignment of lumbar spine in 627 healthy volunteers - Age-related changes and gender difference. <i>Yasutsugu Yukawa, T. Matsumoto, A. Minamide, H. Hashizume, H. Yamada, F. Kato, Japan</i>
09:40-10:00	<b>Discussion</b>

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10:00-10:30	<b>Coffee</b> Location: Banquet Lobby in front of Gyoun (4F)
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10:30-11:00	<b>SESSION #7 SURGICAL OUTCOMES</b> <i>Chairs: Serena Hu &amp; Yoshiharu Kawaguchi</i>
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10:30-10:35	40 Differences in Surgical Practices Between Salaried and Fee-for-Service Surgeons for Degenerative Lumbar Conditions in a Universal Health Payer System <i>Charles G Fisher, D. Banaszek, H. Hall, G. McIntosh, T. Inglis, R. Charest-Morin, N. Manson, Y.R. Rampersaud, K. Thomas, N. Dea, Canada</i>
10:37-10:42	41 Can Minimally Invasive Spinal Fusion Surgery Provide the Better Surgical Outcome than Conventional One in the Treatment of Degenerative Lumbar Spinal Diseases? A minimum of one-year follow-up study <i>Masumi Iwabuchi, H. Fukuda, R. Tominaga, Y. Hanyu, O. Shirado, Japan</i>
10:44-10:49	42 Application study of ERAS in perioperative period of fusion surgery of patients with degenerative lumbar diseases <i>Zhe Wang, X. Hu, Z. Yang, Z. Luo, China</i>
10:49-11:00	<b>Discussion</b>

## WEDNESDAY JUNE 5 (Continued)

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11:00-11:40 **PRESIDENTIAL ADDRESS – TOM OXLAND**

**“ISSLS – Who are we?”**

*Introduction by Kazuhiro Chiba*

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11:40-12:20 **HARRY FARFAN PRESIDENTIAL LECTURE – DR ERIC GRANT**

*Radiation Effects Research Foundation of Hiroshima and Nagasaki*

**“Health effects of ionizing radiation exposure – what we’ve learned from the atomic bomb survivors”**

*Introduction: Tom Oxland*

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### **AFTERNOON OUTING**

Meeting place: 4F Auditorium

First bus departs at 12:30

A boxed lunch will be provided

*(See Page 5 for full details)*

## THURSDAY JUNE 6

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06:45 – 07:30	<b>Breakfast</b> Location: Banquet Lobby in front of Gyouon
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<b>07:30-30-08:30</b>	<b>SESSION #8 SURGERY FUSION</b> <i>Chairs: Yong Hai &amp; Tim Yoon</i>
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07:30-07:35	43 Effects of restoration of sagittal balance on adjacent segment degeneration in instrumented lumbar fusions <i><u>Sang-Il Kim</u>, Y. Kim, K. Ha, H. Min, H. Park, South Korea</i>
07:37-07:42	44 Open versus Minimally Invasive Transforaminal Lumbar Interbody Fusion in Obese Patients. A systematic Review and Meta-analysis <i><u>Steven McAnany</u>, A. Alhammoud, O. Aldahamsheh, Y. Othman, A. Vaishnav, C. Gang, S. Qureshi, USA</i>
07:44-07:49	45 Risk factors for readmission and complications in obese and severely obese patients undergoing elective posterior lumbar spine fusion <i><u>Shane Burch</u>, D. Jain, J. Shaw, V. Deviren, A.L. Zhang, S. Berven, USA</i>
07:51-07:56	46 One-third of postoperative scoliosis patients pursue a career path in a healthcare-related field. <i><u>Toshiaki Kotani</u>, T. Sakuma, K. Nakayama, Y. Iijima, K. Watanabe, N. Isogai, T. Akazawa, T. Asada, S. Minami, K. Inage, S. Ohtori, Japan</i>
07:58-08:03	47 Impact of Previous Lumbar Spine Surgery on Outcome of Lumbar Total Disc Replacement: Analysis of Prospective 5-year Follow-up Study Data <i><u>Scott L Blumenthal</u>, D.D. Ohnmeiss, J.E. Zigler, R.D. Guyer, USA</i>
08:05-08:10	48 Adjacent segment degeneration versus disease after lumbar spine fusion for degenerative pathology: A Meta-analysis of the Literature <i><u>Chao Zhang</u>, D. Ruan, China</i>
08:10-08:30	<b>Discussion</b>

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<b>08.30-09:30</b>	<b>SESSION #9 DISC DEGENERATION</b> <i>Chairs: Zorica Buser &amp; Keita Ito</i>
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08:30-08:35	49 Nucleus replacement gets a new chance with annulus sealing <i><u>Laura Zengerle</u>, A. Köhler, C. Hackenbrock, H. Wilke, Germany</i>
08:37-08:42	50 Low-intensity Pulsed Ultrasound Far-field Exposure Increases Matrix Synthesis in Annulus Fibrosus Cells <i><u>Devante A Horne</u>, P. Jones, M. Adams, C. Diederich, J.C. Lotz, USA</i>
08:44-08:49	51 Osteomacs: may be a key factor in the development of Modic changes <i><u>Fengdong Zhao</u>, J. Wang, China</i>
08:51-08:56	52 Autophagy plays protective roles against human disc cellular apoptosis and senescence, but not affect extracellular matrix degradation <i><u>Takashi Yurube</u>, M. Ito, K. Kakutani, Z. Zhang, S. Miyazaki, T. Takada, Y. Kakiuchi, Y. Takeoka, Y. Kanda, R. Tujimoto, R. Kuroda, K. Nishida, Japan</i>
08:58-09:03	53 Viable allograft as a supplemental therapeutic for disc regeneration <i><u>Douglas Beall</u>, G. Wilson, R. Bishop, W. Tally, T. Temple, T. Ganey, USA</i>
09:05-09:10	54 Safety of intradiscal condoliase in the treatment of lumbar disc herniation <i><u>Kazuhiro Chiba</u>, Y. Matsuyama, T. Seo, Japan</i>
09:10-09:30	<b>Discussion</b>

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<b>09:30-10:00</b>	<b>FELLOWSHIP AWARD SESSION</b> <i>Chairs: Kazuhiro Chiba &amp; Christopher Bono</i>  <b>See Page 4 for full details</b>
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<b>10:00-10:20</b>	<b>Coffee</b>
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## THURSDAY JUNE 6 (Continued)

### THE ISSLS PRIZE FOR LUMBAR SPINE RESEARCH

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10:20-10:30	<b>ISSLS PRIZE INTRODUCTION</b>
10:30-11:30	<b>ISSLS PRIZE AWARD CEREMONY</b> <i>Chair: Björn Rydevik</i>
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10:30-10:40	55 Clinical importance of trunk muscle mass for low back pain, spinal balance, and quality of life: A multicenter cross-sectional study <i>Yusuke Hori, M. Hoshino, K. Inage, M. Miyagi, S. Takahashi, S. Ohyama, A. Suzuki, T. Tsujio, H. Terai, S. Dohzono, R. Sasaoka, H. Toyoda, M. Kato, A. Matsumura, T. Namikawa, M. Seki, K. Yamada, H. Habibi, H. Salimi, M. Yamashita, T. Yamauchi, T. Furuya, S. Orita, S. Maki, Y. Shiga, M. Inoue, G. Inoue, H. Fujimaki, K. Murata, A. Kawakubo, D. Kabata, A. Shintani, S. Ohtori, M. Takaso, H. Nakamura, Japan</i>
10:40-10:50	<b>Discussion</b>
10:50-11:00	56 Physical activity attenuates fibrotic alterations to the multifidus muscle associated with intervertebral disc degeneration <i>Paul Hodges, G. James, D. Klyne, M. Millecamps, L. Stone, Australia</i>
11:00-11:10	<b>Discussion</b>
11:10-11:20	57 Biomechanical changes in dynamic sagittal balance and lower limb compensatory strategies following realignment surgery in adult spinal deformity patients. <i>Jeannie Bailey, R.P. Matthew, S. Seko, P. Curran, L. Chu, S.H. Berven, V. Deviren, S. Burch, J. Lotz, USA</i>
11:20-11:30	<b>Discussion</b>
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11:30-12:20	<b>INVITED LECTURE – PROFESSOR OSAMU HONMOU</b> <i>Molecular Medicine and Neural Repair and Therapeutics, Sapporo Medical University School of Medicine, Japan</i> <b>“Cell Therapy for Spinal Cord Injury”</b> <i>Chair: Shin-ichi Konno</i>
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12:20-13:30	<b>Lunch</b> Location: Suiun (3F)
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13:30-14:30	<b>SESSION #10 BASIC SCIENCE, IMAGING</b> <i>Chairs: Asseem Sharma &amp; Daisuke Sakai</i>
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13:30-13:35	58 Ultrasound measurement of the skin as a potential marker of bone quality: A prospective pilot study of patients undergoing lumbar spinal fusion <i>Stephan N Salzmann I. Okano, C. Rentenberger, C. Ortiz Miller, P. Schadler, O.C. Sax, T.T. Miller, J. Shue, A.L. Boskey, A.A. Sama, F.P. Cammisa, F.P. Girardi, A.P. Hughes, USA</i>
13:37-13:42	59 Enhance long-term stability of alginate-based polyelectrolyte complex BMP-2 carrier by freeze-drying in spinal fusion <i>Wing Moon Raymond Lam, L. Liu, M. Wang, J. Li, C. Goh, H. Wong, Singapore</i>
13:44-13:49	60 The impact of obesity, diabetes, and epidural steroid injections on regional Bone Mineral Density (BMD) measured by Quantitative Computed Tomography (QCT) in the lumbosacral spine <i>Ichiro Okano, C. Jones, S.N. Salzmann, C. Ortiz Miller, T. Shirahata, C. Rentenberger, J. Shue, J.A. Carrino, A.A. Sama, F.P. Cammisa, F.P. Girardi, A.P. Hughes, USA</i>
13:51-13:56	61 The importance of lumbar level stratification for quantitative MR studies of lumbar intervertebral discs: a cross-sectional analysis of 101 healthy adults <i>Hanna Hebelka, K. Lagerstrand, H. Brisby, P. Owen, D. Belavy, Sweden</i>
13:58-14:03	62 Feasibility of lumbar disc lamellar measurement with in-vivo ultrasonography <i>Claudio Vergari, T. Langlais, P. desprairies, P. Rohan, R. Pietton, J. Dubousset, J. Meakin, C. Winlove, R. Vialle, W. Skalli, France</i>
14:05-14:10	63 Symptomatic implant/construct failure after metastatic spine tumour surgery <i>Naresh Kumar, R.S. Patel, D. Sonawane, J. Song, A.P. Singla, H. Milavec, N. Ravikumar, J. Ruiz, H. Hey, H. Wong</i>
14:10-14:30	<b>Discussion</b>



## THURSDAY JUNE 6 (Continued)

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### 14.30-15:30 GENERAL POSTER SESSION

Location: Gyoun (North) (4F)

Drinks and Coffee will be served during this session

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### 15.30-16:30 SESSION #11 STENOSIS

Chairs: Robert Gunzburg & Kotaro Nishida

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- 15:30-15:35 64 Intraspinial diffusion tensor imaging parameters in quantitative assessment of patients with lumbar spinal canal stenosis  
Masaki Norimoto, Y. Eguchi, H. Kanamoto, Y. Oikawa, T. Furuya, S. Orita, K. Inage, Y. Shiga, S. Maki, M. Inoue, T. Umimura, T. Sato, M. Sato, m. suzuki, K. Enomoto, S. Ohtori, Japan
- 15:37-15:42 65 How does lumbosacral multi-level spondylolytic spondylolisthesis differ from mono-level spondylolytic spondylolisthesis in spino-pelvic sagittal alignment?  
Xu Sun, Q. Zhou, X. Cheng, L. Xu, S. Li, C. Du, B. Qian, Z. Zhu, Y. Yu, B. Wang, Y. Qiu, China
- 15:44-15:49 66 Facet Joint Capsular Laxity in Degenerative Lumbar Spondylolisthesis Associated with the Increased Expression of Fractalkine CX3CL1/CX3CR1 Chemokine  
In-Soo Oh, S. Kim, K. Ha, K. Rhyu, South Korea
- 15:51-15:56 67 Association of hypertrophy of the ligamentum flavum with an increase in myofibroblasts in the dorsal layer of the ligament in lumbar spinal canal stenosis  
Fumio Hayashi, K. Higashino, M. Morimoto, Y. Goda, N. Sato, Y. Morimoto, T. Sakai, Y. Takata, F. Tezuka, K. Sairyō, Japan
- 15:58-16:03 68 Automation of MRI gradings to aid longitudinal studies of lumbar spinal stenosis in the Wakayama Spine Study  
Yuyu Ishimoto, A. Jamaludin, C. Cooper, k. Walker-Bone, H. Yamada, H. Hashizume, H. Oka, S. Tanaka, N. Yoshimura, M. Yoshida, J. Urban, T. Kadir, J. Fairbank, Japan
- 16:05-16:10 69 The influence of developmental spinal stenosis on reoperation risk at the adjacent segment after decompression surgery for lumbar spinal stenosis  
Jason Pui Yin Cheung, P. Cheung, Hong Kong
- 16:10-16:30 **Discussion**
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### 16:30-17:30 DEBATE

**Blended learning vs conventional education for spine specialists and research**

Chairs: Tom Oxland, Dino Samartzis, Ashish Diwan

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### 17:30-18:30 Second Business Meeting (for memers only)

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### 19:00-21:00 Banquet

Location: Suiun (3F)

## FRIDAY JUNE 7

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07:00-07:45	<b>Breakfast</b> Location: Banquet Lobby in front of Gyoun (4F)
07:45-08:45	<b>SPECIAL POSTER SESSION #2F: BIOLOGY</b> <i>Chairs: James Iatridis &amp; Nam Vo</i> Location: Small Banquet Hall – Kame (5F) <b>SPECIAL POSTER SESSION #2G: BIOMECHANICS, BIOLOGY</b> <i>Chairs: Cornelia Neidlinger-Wilke &amp; Miho Sekiguchi</i> Location: Small Banquet Hall – Tsuru (5F) <b>SPECIAL POSTER SESSION #2H: NON-SURGERY</b> <i>Chairs: Ken Ishii &amp; Fabio Zaina</i> Location: Small Banquet Hall – Ume (5F) <b>SPECIAL POSTER SESSION #2I: SURGERY TECHNIQUES</b> <i>Chairs: Naresh Kumar &amp; Kazuyuki Watanabe</i> Location: Small Banquet Hall – Take (5F) <b>SPECIAL POSTER SESSION #2J: INFECTION/OSTEOPOROSIS</b> <i>Chairs: Koji Akeda &amp; Koji Otani</i> Location: Small Banquet Hall – Matsu (5F)
09:00-09:10	<b>Report from Focus Groups</b> <i>Chair: Kazuhiro Chiba</i>
09:10-09:40	<b>Session #12 INFECTION</b> <i>Chairs: Teija Lund &amp; Masahiro Kanayama</i>
09:10-09:15	70 Hypoalbuminemia and Elevated CRP as Predictors for Superficial, Deep, and Urinary Tract Infections <i>Zorica Buser, B. Yoshida, A. Nguyen, B. Formanek, M. Alam, J. Wang, USA</i>
09:17-09:22	71 Clinical Features and Treatments of Pyogenic Spondylodiscitis with Severe Paralysis <i>Tepei Hayashi, M. Kato, Japan</i>
09:24-09:29	72 Avoiding infection and screw loosening due to biofilm at bone-screw interface: Periop measures <i>Anand Agarwal, A. Agarwal, B. Lin, C. Schultz, V. Goel, D. McGowan, H. Elgafy, C. Karas, J. Wang, S. Garfin, N. Anand, USA</i>
09:29-09:40	<b>Discussion</b>
10:10-11:10	<b>Session #13 BASIC SCIENCE, BIOMECHANICS</b> <i>Chairs: Alejandro Espinoza &amp; Hans-Joachim Wilke</i>
10:10-10:15	73 Immuno-stimulatory capacity of decorin in the intervertebral disc and the mechanical consequence of resultant inflammation <i>Diane Gregory, M. Guerreiro, D. Zwambag, S. DeWitte-Orr, Canada</i>
10:17-10:22	74 810nm low level laser therapy regulating polarization of M1/M2 macrophages and its mechanism <i>Zhe Wang, J. Zhang, J. Sun, Q. Zheng, X. Hu, China</i>
10:24-10:29	75 Mechanical characterization of lumbar annulus fibrosus in adolescent idiopathic scoliosis before and after surgical intervention <i>Claudio Vergari, L. Chanteux, R. Pietton, T. Langlais, R. Vialle, W. Skalli, France</i>
10:31-10:36	76 Cortical trajectory pedicle screws versus traditional trajectory: differences in fatigue loading conditions <i>Steven T Swinford, T.R. Johnston, A.W. Behn, T.F. Alamin, USA</i>
10:38-10:43	77 Dysregulated bone marrow stromal cells in Modic type 1 changes <i>Stefan Dudli, D. Hänni, A. Jüngel, M. Betz, J. Spirig, F. Brunner, M. Farshad, O. Distler, Switzerland)</i>
10:45-10:50	78 High Fat Diet and Leptin Receptor Deficiency have Sex-Dependent Effects on Spinal Structures in a Type 2 Diabetes Mouse Model <i>Svenja Illien-Junger, D.M. Natelson, D. Krishnamoorthy, J. Iatridis, USA</i>
10:50-11:10	<b>Discussion</b>

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## FRIDAY JUNE 7 (Continued)

11:10-12:10

### Session #14 SURGERY

Chair: Haruki Funao & David Wong

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- 11:10-11:15 79 Effect of spinal surgery on prognosis in patients with symptomatic spinal metastasis: a prospective cohort study  
Kenichiro Kakutani, Y. Sakai, T. Yurube, T. Takada, Z. Zhang, S. Miyazaki, Y. Kakiuchi, Y. Takeoka, Y. Kanda, R. Tsujimoto, T. Iguchi, R. Kuroda, K. Nishida, Japan
- 11:17-11:22 80 Prognostic factors for drop foot due to lumbar degenerative diseases: The impact of surgical timing on postoperative recovery.  
Soichiro Masuda, Y. Kanba, J. Kawai, N. Ikeda, Japan
- 11:24-11:29 81 Predictive factors related with recovery of bowel and bladder function and ambulatory capacity in surgically treated traumatic conus medullaris syndrome with thoracolumbar fracture  
Chang-Hoon Jeon, N. Chung, H. Lee, S. Moon South Korea
- 11:31-11:36 82 No long-time benefit from fusion in decompressive surgery for lumbar spinal stenosis. 5 year-clinical results and 2-year MRI follow-up from the Swedish Spinal Stenosis Study, a multicenter RCT of 233 patients.  
Thomas Karlsson, P. Försth, M. Skorpil, K. Pazarlis, P. Öhagen, K. Michaelsson, B. Sanden, Sweden
- 11:38-11:43 83 A Comparison of Functional and Quality of Life Improvement in Six Different Types of Lumbar Surgery in a Pan Canadian Database.  
Mina Aziz, A. Kelly, M. Weber, G. McIntosh, P. Jarzem, Canada
- 11:45-11:50 84 Association between the definition of unfavorable surgical outcomes and their risk factors after spine surgery for lumbar spinal stenosis  
Ho-Joong Kim, D. Shin, J. Yeom, C. Lee, B. Chang, South Korea)
- 11:50-12:00 **Discussion**
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### CLOSING REMARKS – MAMORU KAWAKAMI

Chair: Kazuhiro Chiba

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# POST-CONGRESS SYMPOSIUM

Friday June 7

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**Time:** 14:00 – 14:05  
**Location:** The Hotel Okura Kyoto (ISSLS Meeting Venue)  
**Registration:** \$100 (on-site)

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**14:00-14:05**    **Opening Remarks**

**14:05-14:40**    **LECTURE 1 - Moderator: Dr. Anne Mannion**

**Title: Clinical and imaging phenotyping: what we know, what we don't know, and future directions**

**Speaker: Dr. Dino Samartzis**

*Department of Orthopaedic Surgery, Institute for Spine Research & Innovation (ISRII) RUSH University Medical Center*

**14:40-15:15**    **LECTURE 2 - Moderator Dr. Helena Brisby**

**Title: Spinal Column Pain and its Various Dimensions**

**Speaker: Dr. Ashish Diwan**

*St George & Sutherland, Clinical School, Faculty of Medicine, The University of New South Wales*

**15:15-15:50**    **LECTURE 3 - Moderator: Dr. Serena Hu**

**Title: Motor Deficits from Degenerative Lumbar Compression: What's the Prognosis?**

**Speaker: Dr. Christopher Bono**

*Department of Orthopaedic Surgery, Massachusetts General Hospital, Harvard Medical School, Harvard Medical School*

**15:50-16:25**    **LECTURE 4 - Moderator: Dr. Shin-ichi Konno**

**Title: New patient reported outcome measures with greater precision over a wider range of scores**

**Speaker: Dr. Shunichi Fukuhara**

*Former Dean, Kyoto University School of Public Health*

**16:25**            **Closing remarks**

# SPECIAL POSTERS SESSION #1

Wednesday June 5 – 07:45 – 08:45

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## SPECIAL POSTER SESSION #1A: BIOLOGY

Chairs: Helena Brisby & Gen Inoue

Location: Small Banquet Hall – Kame (5F)

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- SP1** **Daphne Hingert** Signaling peptides from human mesenchymal stem cells including connective tissue growth factor enhance chondrogenesis in disc cells.
- SP2** **Aaron J Fields** J. Wong, S.L. Sampson, H. Bell-Briones, A. Ouyang, J.C. Lotz  
Nutrient supply and nucleus pulposus cell function: effects of the transport properties of the cartilage endplate and potential implications for intradiscal biologic therapy
- SP3** **Yutaro Kanda** K. Kakutani, Y. Morita, T. Yurube, Z. Zhang, S. Miyazaki, Y. Kakiuchi, Y. Takeoka, R. Tsujimoto, T. Kurakawa, T. Takada, R. Kuroda, K. Nishida  
The role of integrin $\alpha$ 5 $\beta$ 1 in the alteration of notochordal cell induced by dynamic loading
- SP4** **Mauro Alini** S. Wangler, M. Peroglio, U. Menzel, L. Benneker, L. Haglund, D. Sakai, S. Grad  
MSC homing into intervertebral discs enhances the Tie2 positive progenitor cell population, prevents cell death and induces a proliferative response
- SP5** **Satoshi Suzuki** E. Okada, O. Tsuji, N. Nagoshi, M. Yagi, T. Tsuji, T. Miyamoto, K. Watanabe, M. Matsumoto, M. Nakamura, N. Fujita  
Potential involvement of oxidative stress/inflammatory cytokines cascade in ligamentum flavum hypertrophy
- SP6** **Koji Akeda** I. Akihiro, M. Shimaoka, K. Okumura, S. Takbayashi, N. Takegami, T. Sudo, T. Iwasaki, A. Sudo  
Genome-wide DNA methylation analysis identifies a differentially methylated profile associated with human intervertebral disc degeneration
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## SPECIAL POSTER SESSION #1B: BIOMECHANICS

Chairs: Fabio Galbusera & Osamu Shirado

Location: Small Banquet Hall – Tsuru (5F)

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- SP7** **Helena Brisby** M. Khalil, K. Lagerstrand, H. Hebelka  
Diurnal variation of vertebral T2-time investigated with T2 mapping
- SP8** **Amir Jamaludin** T. Kadir, A. Zisserman, C. Pereira, F. Williams, J. Urban, J. Fairbank  
Disc Degeneration – More Than an Aging Process
- SP9** **Alejandro A Espinoza** F. Mukhtar, G.B. Andersson, H.S. An, N. Inoue  
Is the Lumbar Spinous Process a Reliable Sagittal Plane Reference Landmark?
- SP10** **Harvinder Chhabra** M. Gupta, A. Pedaballe  
Is the anatomy of failure in lumbar disc herniation clinically relevant?: a prospective study
- SP11** **Claudio Vergari** M. Karam, R. Pietton, R. Vialle, I. Ghanem, W. Skalli, A. Assi  
Lumbar spine slenderness in adolescent idiopathic scoliosis
- SP12** **Sho Inoue** M. Miyagi, K. Murata, T. Koyama, Y. Otake, A. Kuroda, A. Kawakubo, S. Ohtori, K. Inage, K. Uchida, G. Inoue, M. Takaso  
Does Body Mass Index Affect Spinal Alignment and Low Back Pain in Patients with Primary Osteoporosis?
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## SPECIAL POSTER SESSION #1C: REHABILITATION

Chairs: Jiri Dvorak & Hiroshi Hashizume

Location: Small Banquet Hall – Ume (5F)

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- SP13** **Daniel L Belavy** P.J. Owen, C. Miller, N. Mundell, S.J. Verswijveren, S. Tagliaferri, H. Brisby, S. Bowe  
A network meta-analysis of effectiveness of specific modes of exercise for chronic low back pain
- SP14** **Scott D Tagliaferri** C.T. Miller, J.J. Ford, A.J. Hahne, L.C. Main, P.J. Owen, K.J. Simson, D.L. Belavy  
Optimising conservative management of chronic low back pain: a randomised trial of general strength and conditioning versus motor control manual therapy.
- SP15** **Miyako Suzuki** M. Millecamps, S. Ohtori, L.S. Stone  
Voluntary Physical Activity Reinforces the Efficacy of Acute Non-Steroidal Anti-inflammatory Drug Treatment for Osteoporosis-related Pain in a Mouse Model of Ovariectomy-induced Osteoporosis.

- SP16** **Michele Battie** Y. Xiao, M. Fortin, J. Ahn, H. Rivaz, T. Peters  
Statistical morphometric analysis of lumbar paraspinal muscles in patients with lumbar pathology
- SP17** **Masaki Norimoto** Y. Eguchi, T. Toyoguchi, K. Inage, K. Fujimoto, T. Furuya, S. Orita, Y. Shiga, S. Maki, M. Inoue, T. Umimura, T. Sato, M. Sato, m. suzuki, K. Enomoto, S. Ohtori  
Analysis of skeletal muscle mass in women over 40 with degenerative lumbar scoliosis.
- SP18** **Daniel Chepurin** U. Chamoli, K. Sheldrick, S. Lapkin, D. Scott, J. Kuan, A.D. Diwan  
Bony stress in the lumbar spine is associated with disc degeneration and pain in the lower back. A retrospective case-control MRI study of patients under 25-years of age.

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#### SPECIAL POSTER SESSION #1D: DEFORMITY

Chairs: Jason Pui Yin Cheung & Daisuke Togawa

Location: Small Banquet Hall – Take (5F)

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- SP19** **Whoan Jeang Kim** S. Hwang, S. Kim, C. Ma, J. Lee, D. Song, K. Park, W. Choy  
Prevention of adjacent segmental disease after fusion in degenerative spinal disorder: correlation between segmental lumbar lordosis ratio and PI-LL mismatch for a minimum 5-year follow-up
- SP20** **Takehide Katogi** T. Akazawa, T. Kotani, Y. Iijima, K. Nakayama, T. Sakuma, S. Minami  
What factors affect low back pain of patients with Adolescent Idiopathic Scoliosis average 35 years after surgery?
- SP21** **Tsutomu Akazawa** T. Umehara, M. Inuma, K. Asano, Y. Torii, S. Kuroya, H. Niki, T. Kotani, T. Sakuma, S. Minami, S. Orita, K. Inage, Y. Shiga, K. Takahashi, S. Ohtori  
Spinal alignments of non-fused lumbar curve affect the disc degenerations after selective thoracic fusion in the patients with adolescent idiopathic scoliosis with a minimum 5-year follow-up
- SP22** **Daisuke Togawa** S. Oe, T. Hasegawa, Y. Yamato, G. Yoshida, T. Banno, H. Arima, Y. Mihara, H. Ushirozako, Y. Matsuyama  
What Made Differences between Best and Worst Clinical Results for Adult Spinal Deformity Patients: 2-Year Follow-Up
- SP23** **Daisuke Togawa** S. Oe, T. Hasegawa, Y. Yamato, G. Yoshida, T. Banno, H. Arima, Y. Mihara, H. Ushirozako, T. Yamada, Y. Matsuyama  
Multimodal Analyses Were Required to Understand the Complaints of Adult Spinal Deformity Patients
- SP24** **Naobumi Hosogane** H. Kono, M. Yagi, N. Fujita, H. Sano, M. Takahashi, M. Hasegawa, S. Ichimura, M. Nakamura, M. Matsumoto, K. Watanabe  
Impact of correction surgery on activities of daily living related to Oriental life-style in adult spinal deformity patients. Survey with original ADL questionnaire.

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#### SPECIAL POSTER SESSION #1E: SURGERY OUTCOMES

Chairs: Christopher Bono & Kazuhiro Hasegawa

Location: Small Banquet Hall – Matsu (5F)

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- SP25** **R.A. Coronado** Kristin R Archer, J.S. Pennings, A.L. Henry, M.T. O'Brien, R.L. Skolasky, C.M. Haug, L.H. Riley III, B.J. Neuman, J.S. Cheng, O.S. Aaronson, C.J. Devin, S.T. Wegener  
Performance-Based Tests as Predictors of Patient-Reported Outcomes at 1-Year Following Lumbar Spine Surgery
- SP26** **Max Jakobsson** H. Brisby, A. Gutke, M. Lundberg, R. Smeets  
Physical capacity tasks assessing functional status in patients scheduled for lumbar fusion surgery were not associated with depression, pain catastrophizing, and fear of movement
- SP27** **Tetsuro Ohba** S. Ebata, H. Oba, K. Koyama, H. Haro  
Predictors of poor Global Alignment and Proportion score after surgery for adult spinal deformity
- SP28** **Steven M Presciutti** T. Doan, M. Teklemariam, S. Sangadala, S.D. Boden, H. Drissi  
The Spatial and Temporal Expression of Sclerostin and Canonical Wnt Signaling Factors in the Maturing Posterolateral Spine Fusion
- SP29** **Ji-Won Kwon** J. Lee, J. Yang, K. Suk, H. Kim, S. Moon, H. Lee, B. Lee  
Intraoperative real-time stress analysis using EEG and heart rate over 800 surgeries; multi-center prospective study among 12 orthopedic surgeons
- SP30** **Srikanth N Divi** D.K. Goyal, M.S. Galetta, C.K. Kepler, A.R. Vaccaro, G.D. Schroeder  
Patient outcomes following short-segment lumbar fusion are not affected by PI-LL mismatch

## SPECIAL POSTERS SESSION #2

Friday June 7 – 07:45 – 08:45

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### SPECIAL POSTER SESSION #2F: BIOLOGY

Chairs: James Iatridis & Nam Vo

Location: Small Banquet Hall – Kame (5F)

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- SP31** Jianru Wang F. Chen, Z. Zheng  
Paraoxonase 1 (PON1) was negatively associated with intervertebral disc degeneration (IVDD).
- SP32** Bao Huang X. Zhang, J. Liu, J. Chen  
Notochord-like cell clusters may retard the progression of disc degeneration
- SP33** Grace E Mosley P. Nasser, A. Lai, D. Charen, T.W. Evashwick-Rogler, J.C. Iatridis  
Sex differences in the interaction between biomechanical tissue properties of rat intervertebral discs and mechanical pain following annular puncture injury
- SP34** Svenja Illien-Junger M.P. Smith, G.K. Zhou, E. Chen, O.M. Torre, D.M. Laudier, E.W. Bradley, J.J. Westendorf, J.C. Iatridis  
Cellularity and Matrix Homeostasis during Intervertebral Disc Degeneration is Regulated via Phlpp1
- SP35** Jinwei Ying D. Ruan, S. Pei, L. Su, T. Wen, C. Xu  
Injectable RADA16-I hydrogel conjugated with a bioactive short peptide from BMP-7 attenuates intervertebral disc degeneration in canine
- SP36** Nikolaos Papadimitriou H. Hebelka, A. Baranto, K. Lagerstrand, H. Brisby  
Longitudinal MRI controls of intervertebral discs up to 24 months after transplantation of autologous mesenchymal stromal cells in 10 patients
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### SPECIAL POSTER SESSION #2G: BIOMECHANICS, BIOLOGY

Chairs: Cornelia Neidlinger-Wilke & Miho Sekiguchi

Location: Small Banquet Hall – Tsuru (5F)

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- SP37** John J Costi D.B. Amin, J. Tavakoli, B.J. Freeman  
Understanding the Impact of Repetitive Lifting Towards Lumbar Disc Herniation: A Clinically Relevant Biomechanical Cadaveric Study
- SP38** Laura Zengerle C. Fleege, T. Theodor Di Pauli von Treuheim, D. Vogele, M. Rauschmann, H. Wilke  
Subsidence risk of vertebral body replacements using a new biomechanical in vitro test method
- SP39** Hugo Massé-Alarie S.E. Salomoni, P.W. Hodges  
Complex reorganization of the nociceptive withdrawal reflexes of the trunk in people with chronic low back pain
- SP40** Tomoyo Irie T. Irie, A. Espinoza, K. Segami, H. An, N. Iwasaki, G.B. Andersson, N. Inoue  
Inter-Level and Intra-pedicle Bone Mineral Density Distribution in the Lumbar Spine Pedicle Cortex
- SP41** Junichi Kushioka T. Kaito, R. Chijimatsu, F. Yano, R. Okada, H. Ishiguro, Z. Bal, J. Kodama, Y. Ukon, D. Tateiwa, Y. Sakai, T. Makino, S. Takenaka, T. Saito, U. Chung, H. Yoshikawa  
A novel small compound prevented intervertebral disc degeneration via PI3K/AKT pathway.
- SP42** Nam Vo D. Wang, R. Hartman, C. Han, M. Jurczak, J. Kang, J. Lee, G. Sowa  
Lactate as a carbon biofuel for annulus fibrosus cells
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### SPECIAL POSTER SESSION #2H: NON-SURGERY

Chairs: Ken Ishii & Fabio Zaina

Location: Small Banquet Hall – Ume (5F)

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- SP43** Chang-Hoon Jeon S. Kim, N. Chung, H. Lee  
Clinical differences of each item of Oswestry Disability Index between the patients with lumbar spinal stenosis and lumbar disc herniation
- SP44** Masakazu Minetama M. Kawakami, M. Teraguchi, R. Kagotani, Y. Mera, T. Sumiya, T. Kitano, M. Nakagawa, Y. Yamamoto, S. Matsuo, Y. Koike, N. Sakon, T. Nakatani, Y. Nakagawa  
Therapeutic advantages of frequent physical therapy sessions for patients with lumbar spinal stenosis
- SP45** Maruf Mohammad Hasib A. Suzuki, K. Hayashi, H. Hasibullah, S. Hamidullah, S. Ohyama, K. Tamai, K. Yamada, H. Terai, H. Nakamura  
Advanced Glycolysation End Products (AGEs) in Hypertrophied Ligamentum Flavum of Diabetes Mellitus and Non Diabetes Mellitus

- SP46** **Kentaro Yamada** A. Suzuki, S. Takahashi, K. Tamai, H. Toyoda, M. Hoshino, H. Terai, H. Nakamura  
Risk factors for occurrence of lumbar lesion in patients with rheumatoid arthritis
- SP47** **Junichi Yamada** S. Miyazaki, K. Kakutani, K. Cheng, S. Reyes, E. Linn, E. Abarad, T. Nakazawa, K. Akeda, A. Sudo, K. Masuda  
Comparison of Analgesic Effects between Chimera Decoy Oligodeoxynucleotide and Corticosteroid in the Rat Thrombin-induced Facet Joint Pain Model
- SP48** **Michiaki Mukai** K. Utida, Y. Shiga, K. Inage, S. Orita, N. Hirosawa, K. Murakami, Y. Eguchi, Y. Matsuura, M. Takaso, S. Ohtori  
Effects of exogenously administered basic fibroblast growth factor and Heme oxygenase-1 in a rat sciatic nerve injury model

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### SPECIAL POSTER SESSION #2I: SURGERY TECHNIQUES

Chairs: Naresh Kumar & Kazuyuki Watanabe

Location: Small Banquet Hall – Take (5F)

- SP49** **Charles Ledonio** R. Frisch, T. Shirk, J. Riggleman, I.Y. Luna, D. Brooks, G. Joshua  
Comparative Effectiveness of Expandable versus Static Lateral Lumbar Interbody Fusion Devices: Two Year Clinical and Radiographic Outcomes
- SP50** **Srikanth N Divi** D.K. Goyal, M.S. Galetta, C.K. Kepler, A.R. Vaccaro, G.D. Schroeder  
Fusion technique does not affect short-term patient-reported outcomes for lumbar degenerative disease
- SP51** **Steven McAnany** A. Vaishnav, J. Wright-Chisem, M. Steinhaus, T. Albert, S. Iyer, C. Gang, S. Qureshi  
Effect of Cage Type on Immediate Post-operative Radiographic Outcomes in Single-level Minimally Invasive Transforaminal Lumbar Interbody Fusion (MI-TLIF)
- SP52** **Shingo Miyazaki** K. Kakutani, Y. Sakai, T. Takada, T. Yurube, Z. Zhang, Y. Kakiuchi, Y. Kanda, R. Tsujimoto, R. Kuroda, K. Nishida  
The factor lowering the cost-utility of surgical treatment for patients with metastatic spinal tumor
- SP53** **Brandon L Roller** Z.O. Knio, T.J. O'Gara, J. Tan, L. Lenchik, R.D. Boutin, T. Kadir, A. Jamaludin  
Correlation of automated lumbar MRI grading with microdecompression surgical level
- SP54** **Fredrik Strömqvist** N. Hareni, B. Strömqvist, F. Sigmundsson, B. Rosengren, M. Karlsson  
Back pain improves after lumbar disc herniation surgery

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### SPECIAL POSTER SESSION #2J: INFECTION/OSTEOPOROSIS

Chairs: Koji Akeda & Koji Otani

Location: Small Banquet Hall – Matsu (5F)

- SP55** **Katsuhisa Yamada** M. Takahata, K. Nagahama, A. Iwata, T. Endo, T. Onishi, H. Sudo, M. Ito, N. Iwasaki  
Epidemiology and Risk factors of Multidrug-Resistant Pyogenic Spondylitis in Thoraco-Lumbar spine
- SP56** **Ping-Yeh Chiu** K. Kao, M. Hsieh, T. Tsai  
Is the sandwich vertebra at a higher risk of further fracture? -A retrospective analysis of 1,347 patients undergoing cement augmentation for osteoporotic vertebral compression fracture in a single medical center in Taiwan
- SP57** **Ryo Kitagawa** H. Murakami, S. Demura, S. Kato, K. Shinmura, T. Shimizu, N. Oku, M. Handa, H. Tsuchiya  
Iodine-supported spinal instruments reduce surgical site infection in total en bloc spondylectomy for spinal tumors.
- SP58** **Charles Fisher** O. Ayling  
The effect of peri-operative adverse events on long-term patient reported outcomes after lumbar spine surgery
- SP59** **Ichiro Okano** C. Jones, S. Salzmann, C. Ortiz Miller, C. Rentenberger, J. Shue, J.A. Carrino, A.A. Sama, F.P. Cammisa, F.P. Girardi, A.P. Hughes  
The Regional Effect of Lumbar Fusion Surgery on Volumetric Bone Mineral Density measured by Quantitative Computed Tomography in Adjacent Vertebrae: A Longitudinal Cohort Study
- SP60** **Charles Fisher** O. Ayling, T. Ailon  
National Adverse Event Profile After Lumbar Spine Surgery for Lumbar Degenerative Disease and comparison of complication rate between hospitals: A COSRN Registry Study



## GENERAL POSTER SESSION

### GENERAL POSTER SESSION

THURSDAY JUNE 6 - 14:30 – 15:30

Location: Gyoun (North) (4F)

- GP1** **Dorthe Schoeler Ziegler** L. Carreon, M. Andersen, R. Jensen  
The association between pre-operative MRI findings and surgical revision within three years after surgery for lumbar disc herniation
- GP2** **Wing Moon Raymond Lam** Z. Liao, J. Liu, H. Wong  
Systemic Diclofenac Reduces Post-Operative rhBMP-2 Induced Neuroinflammation at Lumbar Nerve Root in a Rodent Model
- GP3** **Zhe Wang** X. Hu, Z. Luo, P. Huang, Z. Tu, F. Xie  
The influence of the intervertebral disc height and intervertebral disc height index in the single segmental lumbar fusion on the radiographic adjacent segment degeneration (rASD)
- GP4** **Yasuchika YA Aoki** H.H. Takahashi, G.G. Kubota, A.A. Watanabe, T.T. Nakajima, T.T. Sakai, M.M. Inoue, K.K. Takahashi, S.S. Ohtori  
Clinical characteristics and risk factors for subsequent vertebral body fractures in patients with lumbar degenerative disease treated with transforaminal lumbar interbody fusion.
- GP5** **Hiroki Ushirozako** T. Hasegawa, S. Ebata, T. Ohba, K. Mukaiyama, H. Oba, J. Takahashi, H. Haro, Y. Matsuyama  
Remaining of endplate is a risk factor of delayed osseous union after posterior lumbar interbody fusion: a multicenter, prospective, randomized study.
- GP6** **Stephan N Salzmann** T. Shirahata, O.C. Sax, J. Yang, J. Shue, A.A. Sama, F.P. Cammisa, F.P. Girardi, A.P. Hughes  
Does L4/5 Pose Additional Neurologic Risk in Lateral Lumbar Interbody Fusion?
- GP7** **Takahito Fujimori** T. Miwa, M. Iwasaki, T. Oda  
Cost-effectiveness of lumbar surgery in the Japanese universal health insurance system
- GP8** **Takahito Fujimori** H. Sakaura, T. Sugiura, D. Ikegami, K. Tateishi, Y. Mukai, N. Hosono, T. Fuji  
Clinical outcomes and union rate of 2-level PLIF ~Comparison between the lumbar segments and the lumbosacral segments
- GP9** **Kristin R Archer** R.L. Skolasky, R.A. Coronado, C.M. Haug, J.S. Pennings, S.W. Vanston, L.H. Riley III, B.J. Neuman, J.S. Cheng, O.S. Aaronson, C.J. Devin, S.T. Wegener  
Psychologically Informed Physical Therapy for Patients Following Lumbar Spine Surgery: A Randomized Clinical Trial
- GP10** **Nikolaos Papadimitriou** H. Hebelka, A. Baranto, H. Barreto Henriksson, A. Lindahl, H. Brisby  
Autologous mesenchymal stromal cells labeled with iron used for transplantation to intervertebral discs in patients with chronic low back pain.
- GP11** **Shane Burch** D. Jain, W. Durand, A.H. Daniels, S.H. Berven  
Machine learning for predictive modeling of 90-day readmission, major medical complication, and discharge to a facility in patients undergoing surgery for adult spinal deformity: logistic regression vs. random forest
- GP12** **Xuan Lu** Z. Zhu, J. Wu, J. Huang, L. Yu, Z. Wen, Y. Wang  
Vertebral augmentation with bone cement cannot stop creep deformation of the fractured vertebra but may accelerate adjacent disc degeneration
- GP13** **Kristin R Archer** E.R. Oleisky, J.S. Pennings, J. Hills, A. Sivaganesan, I. Khan, R. Call, C. Devin  
Comparing different chronic preoperative opioid use definitions on outcomes after spine surgery
- GP14** **Kazuyuki Watanabe** K. Otani, T. Nikaido, K. Kato, H. Kobayashi, S. Yabuki, S. Kikuchi, S. Konno  
Pre-operative evaluation by the Brief Scale for Psychiatric problems in Orthopaedic Patients (BS-POP) relates to poor surgical outcomes of lumbar decompression surgery
- GP15** **Shizumasa Murata** H. Iwasaki, H. Hashizume, Y. Yukawa, A. Minamide, S. Tsutsui, M. Takami, M. Okada, H. Yamada  
A new anatomical consideration on foraminal decompression for lumbar foraminal stenosis
- GP16** **Dike Ruan** W. Li  
Acellular nerve allograft seeded with SDNF and autogenic ADSCs for nerve root repairment in a beagle model

- GP17** **Yu Yamato** *T. Hasegawa, D. Togawa, G. Yoshida, T. Banno, S. Oe, H. Arima, Y. Mihara, H. Ushirozako, T. Yamada, Y. Matsuyama*  
Extensive spinal fusion surgery to correct severe deformities in patients with Parkinson's disease or Parkinson's syndrome: clinical outcomes over a five-year follow up
- GP18** **Steven McAnany** *L. Ricci, A. Vaishnav, T. Albert, S. Iyer, C. Gang, S. Qureshi*  
Geographic Differences in Intraoperative Neuromonitoring during Minimally Invasive Lateral Spine Surgery
- GP19** **Naresh Kumar** (*Orthopaedic Surgery, National University Health System, Singapore*)  
*R.S. Patel, B.W. Tan, A.P. Singla, L. Khin, N. Ravikumar, H. Milavec, A. Kumar, H. Hey, L. Lau, J. Thambiah, G. Liu*  
Asymptomatic construct failure after metastatic spine tumour surgery: a new entity or a continuum with symptomatic failure?
- GP20** **Xu Sun** *C. Du, L. Xu, S. Li, B. Qian, Z. Zhu, Y. Yu, B. Wang, Y. Qiu*  
Are double-level TLIFs preferable to single-level TLIF for contiguous double-level spondylolytic spondylolisthesis?
- GP21** **Naresh Kumar** *V. G, N. Ravikumar, Y. Ding, Y. Lin, R.S. Patel, N. Naresh, H. Hey, L. Lau, G. Liu*  
Intra-operative neuromonitoring (IONM): is there a role in metastatic spine tumour surgery?
- GP22** **Timothy Ganey** *B. Fox, D. Goss, T. Temple*  
Viable cellular allograft for spine fusion - clinical success comparing two surgical techniques
- GP23** **Naresh Kumar** *R.S. Patel, S. Wang, J. Tan, A.P. Singla, Z. Chen, N. Ravikumar, A. Tan, N. Naresh, H. Hey, B. Vellayappan*  
Factors influencing extended hospital stay in patients undergoing metastatic spine tumour surgery and its impact on survival
- GP24** **Kazuki Takeda** *E. Okada, N. Fujita, S. Suzuki, O. Tsuji, N. Nagoshi, M. Yagi, H. Kono, M. Nakamura, M. Matsumoto, K. Watanabe*  
Association of global sagittal alignment with the adjacent segment disease after posterior lumbar interbody fusion in spondylolytic spondylolisthesis
- GP25** **Giovanni Barbanti Brodano** *G. Tedesco, M. Girolami, V. Pipola, S. Bandiera, S. Terzi, R. Ghermandi, G. Evangelisti, T. Greggi, A. Gasbarrini*  
Carbon-fiber-reinforced PEEK fixation system in the treatment of spine tumours
- GP26** **Giovanni Barbanti Brodano** *M. Girolami, S. Bandiera, S. Terzi, R. Ghermandi, G. Evangelisti, G. Tedesco, V. Pipola*  
Update on custom made 3D printed titanium implants for anterior column reconstruction following en bloc resection for spinal tumours
- GP27** **Kazunari Fushimi** *C. Iwai, S. Nozawa, H. Akiyama*  
Cortical bone trajectory screws for lumbar interbody fusion: Influence on proximal adjacent segment degeneration.
- GP28** **Steven McAnany** *A. Samuel, F. Lovecchio, A. Vaishnav, T. Albert, S. Iyer, C. Gang, S. Qureshi*  
Acute Readmission and Reoperation after Lumbar Decompression Surgery: An Analysis of 81,365 patients
- GP29** **Steven McAnany** *A. Samuel, F. Lovecchio, A. Vaishnav, T. Albert, S. Iyer, C. Gang, S. Qureshi*  
Benefits of Medical Optimization before Thoracolumbar Three-Column Osteotomies: An Analysis of 618 Patients
- GP30** **Steven McAnany** *A. Vaishnav, D. Patel, B. Haws, B. Khechen, K. Singh, C. Gang, S. Qureshi*  
Correlation between ODI and PROMIS in Minimally Invasive Lumbar Microdiscectomy
- GP31** **Chang-Hoon Jeon** *N. Chung, H. Lee, S. Moon*  
Neurological recovery in surgically treated traumatic conus medullaris syndrome combined with thoracolumbar fracture
- GP32** **Steven McAnany** *A. Vaishnav, D. Patel, B. Haws, B. Khechen, K. Singh, C. Gang, S. Qureshi*  
Correlation between ODI and PROMIS in Minimally Invasive Lumbar Decompression Surgery
- GP33** **Zorica Buser** *B. Harwin, B. Formanek, J. Wang*  
Reinfarction rates in patients undergoing lumbar spine procedures
- GP34** **Yuichiro Mima** *M. Yagi, N. Fujita, E. Okada, S. Suzuki, O. Tsuji, N. Nagoshi, M. Nakamura, M. Matsumoto, K. Watanabe*  
Hidden blood loss in extreme lateral interbody fusion for adult spinal deformity
- GP35** **Tomohiko Hasegawa** *H. Ushirozako, D. Togawa, S. Shimizu, Y. Yamato, T. Ohba, H. Oba, K. Mukaiyama, S. Ebata, J. Takahashi, H. Haro, Y. Matsuyama*  
The titanium coated PEEK cage maintains better graft bone contact with the endplate than PEEK cage at six months after PLIF surgery: a multicenter, prospective, randomized study

- GP36** **Mari Lundberg** H. Brisby, A. Gutke, O. Hägg, M. Jakobsson, H. Lotzke, R. Smeets  
A Person-Centered Prehabilitation Program Based on Cognitive-Behavioral Physical Therapy for Patients Scheduled for Lumbar Fusion Surgery – A One Year Follow-Up of A Randomized Controlled Trial
- GP37** **Steven McAnany** A. Vaishnav, P. Saville, S. Kirnaz, R. Navarro-Ramirez, R. Hartl, C. Gang, S. Qureshi  
Immediate Restoration of Lordosis in Single-level Minimally Invasive Transforaminal Lumbar Interbody fusion (MI-TLIF): A comparison of Expandable and Static Interbody Cages
- GP38** **Steven McAnany** A. Vaishnav, J. Mok, T. Albert, S. Iyer, C. Gang, S. Qureshi  
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- GP72** **Kiyoshi Yagi** N. Suzuki, K. Kato, A. Kondo, J. Mizutani  
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Large PI is a risk factor for the progression of scoliosis in patients with lumbar spinal canal stenosis and degenerative lumbar scoliosis.
- GP78** **Minori Kato** T. Namikawa, A. Matsumura, M. Iwamae, H. Nakamura  
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- GP79** **Stefano Boriani** R. Cecchinato, P. Berjano, C. Martini, C. Lamartina  
Changes in Pelvic Incidence after long spinal fusions for adult deformity
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- GP81** **Fengdong Zhao** J. Liu  
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- GP84** **Moon Soo Park** Y. Ju, T. Kim, J. Oh, C. Kim, C. Chung, H. Chang  
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The Effect of Pre-Operative Epidural Steroid Use on Volumetric Bone Mineral Density in Patients Undergoing Lumbar Fusion Surgery Measured by Quantitative Computed Tomography
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- GP90** **Xinuo Zhang** Y. Hai, L. Guan, Y. Liu, T. Liu  
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- GP91** **Steven McAnany** *Y. Othman, V. Lafage, R. Lafage, J. Elysee, A. Vaishnav, T. Albert, S. Iyer, C. Gang, S. Qureshi*  
Does the actual lordosis gain following use of interbody grafts in fusion operations match the expected gain based on the lordosis of graft itself?
- GP92** **Yong Hai** *J. Zhang*  
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- GP93** **Yasuhiro Shiga** *T. Kotani, S. Orita, K. Inage, T. Miyashita, T. Fujiyoshi, E. Hanaoka, T. Ishikawa, S. Maki, T. Furuya, S. Ohtori*  
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- GP95** **Shane Burch** *T.A. Peterson, D. Jain, D. Lituiev, D. Hadley, S.H. Berven, A.J. Butte*  
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- GP96** **Steven McAnany** *A. Vaishnav, T. Albert, S. Iyer, C. Gang, S. Qureshi*  
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- GP98** **Steven McAnany** *G. Cong, J. Dowdell, A. Vaishnav, T. Albert, S. Iyer, C. Gang, S. Qureshi*  
Increased axial facet angle correlates with poor percutaneous pedicle screw placement
- GP99** **Steven McAnany** *S. Virk, A. Vaishnav, T. Albert, S. Iyer, C. Gang, S. Qureshi*  
Pre-operative muscle health impacts the time it takes to reach minimally clinically important differences in health related quality of life scores for one level lumbar fusions
- GP100** **Hikomitsu Takaoka** *H. Ataka, T. Miyashita, K. Kato, S. Orita, K. Inage, Y. Siga, S. Ohtori, T. Tannno*  
Clinical and radiological result of facet fusion using a ligamentum flavum floating method for degenerative spondylolisthesis
- GP101** **Yasushi Iijima** *T. Kotani, T. Sakuma, K. Nakayama, T. Akazawa, K. Inage, S. Minami, S. Ohtori*  
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- GP102** **Zhongying Zhang** *K. Kakutani, T. Yurube, S. Miyazaki, Y. Takeoka, Y. Kakiuchi, Y. Kanda, R. Tsujimoto, T. Takada, R. Kuroda, K. Nishida*  
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- GP105** **Takayoshi TS Shimizu** *S.S. Fujibayashi, B.B. Otsuki, S.S. Matsuda*  
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- GP110** **Kajsa Rennerfelt** *A. Baranto, H. Brisby*  
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- GP111** **Takashi Kobayashi** *N. Miyakoshi, T. Abe, K. Kikuchi, E. Abe, H. Kinoshita, R. Kimura, Y. Shimada*  
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Hand grip strength can be a useful surrogate marker for postoperative changes in spinopelvic alignment in patients with lumbar spinal stenosis
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- GP117** **Srikanth N Divi** *D.K. Goyal, M.S. Galetta, C.K. Kepler, A.R. Vaccaro, G.D. Schroeder*  
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- GP118** **Sumihisa Orita** *K. Inage, Y. Shiga, M. Inoue, M. Norimoto, T. Umimura, T. Sato, M. Sato, M. Suzuki, K. Enomoto, S. Maki, T. Furuya, S. Ohtori*  
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- GP119** **Tetsuhiko Mimura** *J. Takahashi, S. Ikegami, H. Oba, M. Uehara, S. Kuraishi, T. Takizawa, R. Munakata, T. Hatakenaka, M. Koseki*  
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Does the duration to the surgery affect the reduction of fractured vertebra in posterior short-segment fixation for thoracolumbar burst fractures?
- GP121** **Anne F Mannion** *A. Elfering, J. Bago, F. Pellise, A. Vila-Casademunt, I. Obeid, E. Acaroglu, A. Alanay, F. Sanchez Perez-Grueso, F.S. Kleinstück*  
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- GP127** **Jingwei Liu** *Y. Hai, Y. Zhang, N. Kang*  
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- GP128** **Charles G Fisher** *J.J. Hebert, H. Hall, E. Abraham, E. Bigney, N. Wedderkopp, E. Richardson, M. Darling, G. McIntosh, N. Manson*  
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- GP129** **Steven McAnany** S. Virk, A. Vaishnav, T. Albert, S. Iyer, C. Gang, S. Qureshi  
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- GP130** **Takumi Takeuchi** N. Hosogane, K. Satomi, K. Yamagishi, S. Ichimura  
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- GP131** **Charles Fisher** R. Glennie, C.S. Bailey, Y. Rampersaud, N. Dea  
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- GP132** **Dike Ruan** X. Bai, Q. He, L. Hou, C. Zhang, C. Li  
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- GP133** **Ryota Hyakkan** M. Kanayama, M. Takahata, F. Oha, Y. Shimamura, K. Yoshikawa, T. Watanabe, T. Hashimoto, N. Iwasaki  
Temporal Profile of Serum Bone Metabolic Markers after Posterior/Transforaminal Lumbar Interbody Fusion
- GP134** **Toshiaki Maruyama** K. Yamada, N. Tanaka, T. Hiramatsu, T. Hashimoto, H. Fukui, Y. Fujimoto  
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- GP135** **Xinuo Zhang** Y. Hai, L. Guan, Y. Liu, T. Liu  
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- GP136** **Takashi Sato** K. Enomoto, S. Ohtori, T. Shigemura, Y. Yamamoto, N. Mizuki, R. Tsuchiya, T. Toki, Y. Wada, Y. Murata  
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- GP140** **Hiroshi Takahashi** Y. Aoki, J. Saito, A. Nakajima, M. Sonobe, Y. Akatsu, M. Yamada, K. Koyama, T. Furuya, S. Ohtori, K. Nakagawa  
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- GP141** **Yiqi Zhang** N. Kang, Y. Hai, J. Liu  
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Risk factors for residual low back pain after posterior lumbar interbody fusion
- GP143** **Tomohiro Miyashita** K. Kato, H. Ataka, H. Takaoka, S. Ohtori, T. Tanno  
Good clinical outcomes and fusion rate after facet fusion with cortical bone trajectory screws for degenerative lumbar spondylolisthesis
- GP144** **Sam Yeol Chang** H. Kim, C. Lee, B. Chang  
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- GP145** **Steven McAnany** M. Mansur, S. Virk, R. Goto, A. Vaishnav, T. Albert, S. Iyer, C. Gang, S. Qureshi  
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- GP146** **Wouter A. Moojen** C.D. Schenck, S. Terpstra, E.W. Van Zwet, W.C. Peul, M.P. Arts, C.L. Vleggeert-Lankamp  
5-year results of a double-blind RCT on comparing interspinous implant without bony decompression to conventional decompression for lumbar spinal stenosis
- GP147** **Scott L Blumenthal** R. Haddas, I. Lieberman  
Does Improvement in Static Balance Alignment Truly Enhance Dynamic Body Balance?
- GP148** **Scott L Blumenthal** R.D. Guyer, J.E. Zigler, D.D. Ohnmeiss  
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- GP149** **Hiroshi Ataka** *T. Tanno, H. Takaoka, T. Miyashita, K. Kato, S. Ohtori*  
Early Reduction of Ligamentum Flavum 2 Weeks after Posterior Fusion in situ without Direct Posterior Decompression for Unstable Degenerative Lumbar Spondylolisthesis
- GP150** **Steven McAnany** *S. Virk, J. Mok, A. Vaishnav, T. Albert, S. Iyer, C. Gang, S. Qureshi*  
Do patients that catastrophize back and leg pain prior to lumbar decompression do worse after surgery?
- GP151** **Charles Ledonio** *A. Mohit, J.R. Riggleman, A.L. Edsall, S. Khalil*  
Minimally Invasive Sacroiliac Joint Fusion Using a Novel Hydroxyapatite-Coated Screw System Improves Functional Outcomes in Patients with Sacroilitis at One-Year Follow-up
- GP152** **Yaoshen Zhang**  
Obesity and High Fasting Blood Glucose as Independent Risk Factors for Reoperation after Endoscopic Discectomy
- GP153** **Scott L Blumenthal** *D.D. Ohnmeiss, R.D. Guyer, J.E. Zigler*  
In Which Cases Do Surgeons Specializing in Total Disc Replacement Perform Fusion in Patients with Symptomatic Lumbar Disc Degeneration?
- GP154** **Steven McAnany** *A. Vaishnav, E. Feuchtbaum, E. Sheha, A. Samuel, T. Albert, S. Iyer, S. Qureshi*  
Same-day Discharge versus Inpatient Lumbar Fusion: A Matched Cohort Comparison of Four Surgical Approaches
- GP155** **Dong-Gune Chang** *G. Kim, P. Karki, Y. Nam, H. Jung, M. Kim, K. Ha, J. Park*  
Extension of distal fusion at L4 improves radiologic results for rigid curves in major thoracolumbar and lumbar adolescent idiopathic scoliosis.
- GP156** **Atsushi Kojima** *T. Aihara, K. Hatakeyama, M. Urushibara*  
Ballon kyphoplasty combined with Minimally invasive percutaneous pedicle screw fixation in the surgical treatment of osteoporotic vertebral fracture.
- GP157** **Dino Samartzis** *M.T. Nolte, B.A. Basques, P. Louie, J.M. Khan, J.C. Paul, A.G. Varthi, E.J. Goldberg, H.S. An*  
Does the Number of Surgically Decompressed Levels in Lumbar Spinal Stenosis Patients "Predict" Postoperative Clinical Outcomes?
- GP158** **Masahiro Tanaka** *D. Sakai, T. Nukaga, A. Hiyama, M. Sato, M. Watanabe*  
Clinical result of kyphoscoliosis comparison between degenerative kyphoscoliosis and kyphoscoliosis with osteoporotic vertebral fracture
- GP159** **Kentaro Yamada** *Y. Abe, S. Satoh, H. Nakamura*  
An Analysis for safety insertion of sacral alar-iliac screw on the fluoroscopy, using three-dimensional analyzing software
- GP160** **Kentaro Yamada** *Y. Abe, Y. Yanagibashi, T. Hyakumachi, S. Satoh, H. Nakamura*  
Risk factors for reoperation after decompression for lumbar spinal stenosis in patients with diffuse idiopathic skeletal hyperostosis extended to lumbar segment
- GP161** **Charles Fisher** *J. Urquhart, R. Glennie, B. Kwon, S. Casha, E. Abraham, N. Manson, J. Street, K. Thomas, M. Dvorak, M. Boyd, N. Gelinas-Phaneuf, N. Dea, Y. Rampersaud, R. Charest-Morin, S. Paquette, T. Ailon, G. McIntosh, C.S. Bailey*  
A CSORN study of spinopelvic sagittal alignment after operative treatment for lumbar degenerative spondylolisthesis
- GP162** **Kiyotaka Yamada** *N. Tanaka, T. Hiramatsu, T. Hashimoto, T. Maruyama, H. Fukui, Y. Fujimoto*  
Surgical outcomes of percutaneous endoscopic discectomy for adolescent lumbar disc herniation
- GP163** **Sang-II Kim** *H. Park, Y. Kim, K. Ha, I. Oh, J. Seo, D. Chang*  
What is the role of surgery for spinal metastasis of lung cancer? - Propensity score matched analysis between surgery with radiotherapy and radiotherapy alone
- GP164** **Yue Wang** *K. Wu, Z. Feng, X. Hu*  
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- GP165** **Steven McAnany** *(Weill Cornell Medical College, New York)*  
*J. Mok, A. Vaishnav, T. Albert, S. Iyer, C. Gang, S. Qureshi*  
Return to Activities and Discontinuation of Narcotics after Minimally Invasive Spine Surgery
- GP168** **Kenichi Kawaguchi** *M. Hayashida, S. Okada, A. Matsushita, H. Saiwai, Y. Matsumoto, K. Harimaya, G. Kato, Y. Nakashima*  
Relationship between global sagittal alignment and surgical outcomes after minimally invasive posterior decompression in patients with lumbar spinal stenosis
- GP173** **Hirooki Endo** *H. Murakami, D. Yamabe, K. Miya, Y. Abe, Y. Chiba, R. Oikawa, M. Doita*  
Effect of indirect decompression and influence of adjacent segments after lateral lumbar interbody fusion for lumbar degenerative spondylolisthesis

- GP174** **Mina Aziz** *P. Jarzem, C. Fisher, M. Johnson, G. McIntosh, M. Weber*  
Trends in Opioid Usage Two Years Following Thoracolumbar Spine Surgery
- GP175** **Yu-Hua Huang**  
Impact of Body Mass Index on Adjacent Segment Disease after Lumbar Fusion for Degenerative Spine Disease
- GP176** **Takato Aihara** *K. Endo, H. Suzuki, A. Kojima, Y. Matsuoka, T. Takamatsu, K. Murata, T. Kusakabe, A. Maekawa, S. Ohtori, M. Urushibara, K. Yamamoto*  
Long-term outcomes following lumbar microendoscopic discectomy and microendoscopic decompression: Minimum 10-year follow-up evaluation performed using a patient-based outcome measure
- GP177** **Todd Alamin** *K. Hall, J. Koltsov, M. Stauff, K. Wittayapair, I. Cheng, S. Hu*  
A Prospective Evaluation of the Results of Bilateral Decompression Alone in Patients with Grade 1 Degenerative Spondylolisthesis
- GP178** **Masakazu Minetama** *M. Kawakami, M. Teraguchi, R. Kagotani, Y. Mera, T. Sumiya, T. Kitano, M. Nakagawa, Y. Yamamoto, S. Matsuo, Y. Koike, N. Sakon, T. Nakatani, Y. Nakagawa*  
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- GP179** **Sungbae Park**  
Risk factors for vertebral, hip, and femoral fractures among patients with Parkinson disease: A 5-year follow-up in Korea
- GP180** **Hiroshi Takahashi** *Y. Aoki, J. Saito, A. Nakajima, M. Sonobe, Y. Akatsu, M. Yamada, K. Koyama, Y. Akiyama, T. Iwai, S. Nakano, K. Yanagisawa, T. Furuya, S. Ohtori, K. Nakagawa*  
Serum oxidative stress reflects the severity of neurological damage in patients with lumbar canal stenosis: a pilot cross-sectional human study
- GP181** **Takashi TH Hirai** *T.T. Yoshii, T. Yokoyama, A. Okawa*  
A novel therapeutic strategy for 3' untranslated region of neuropathic pain target genes
- GP182** **Ichiro Okano** *S. Salzmann, C. Ortiz Miller, C. Rentenberger, J. Shue, J.A. Carrino, A.A. Sama, F.P. Cammisa, F.P. Girardi, A.P. Hughes*  
The Impact of Degenerative Disc Disease on Regional Volumetric Bone Mineral Density (vBMD) measured by Quantitative Computed Tomography
- GP183** **Yusuke Sato** *Y. Oshima, K. Kashiwabara, Y. Taniguchi, Y. Matsubayashi, S. Kato, S. Hirai, N. Tachibana, H. Hasebe, S. Tanaka*  
Risk factors and progression rate of sacroiliac joint degeneration in asymptomatic subjects
- GP184** **Takashi Yurube** *T. Takeoka, N. Watanabe, H. Inaoka, K. Kakutani, T. Takada, Y. Kakiuchi, Y. Takeoka, Y. Kanda, R. Tsujimoto, S. Miyazaki, Z. Zhang, R. Kuroda, K. Nishida*  
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- GP185** **Leena Ristolainen** *D. Schlenzka, M. Ylikoski, M. Poussa, T. Yrjönen*  
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- GP186** **Sheen Gurrib** *R. Cameron, S. Best*  
Investigation of the 3D vascular network in vertebral end plates using micro-computed tomography
- GP187** **Haotian Shen** *J. Huang, Q. Zheng, Y. Liu, Y. Wang*  
A deep learning based fully automated program to segment and quantify paraspinal muscles on axial lumbar spine MR images
- GP188** **Byeongwoo Kim** *P. Ahn, D. Lee, D. Shin, S. Yi, Y. Ha, D. Yoon, K. Kim*  
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- GP189** **Jiawei Huang** *H. Shen, J. Wu, Y. Liu, Y. Wang*  
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- GP190** **Hiroyuki Oka** *K. Matsudaira, T. Fujii*  
The effect of the "One Stretch" exercise on the improvement of low back pain in Japanese nurses: a large-scale, randomized, controlled trial
- GP191** **Ho-Joong Kim** *B. Chang, J. Yeom, C. Lee*  
Assessment of sarcopenia in patients with sagittal imbalance and symptomatic lumbar spinal stenosis
- GP192** **Koji Otani** *S. Kikuchi, T. Nikaido, S. Konno*  
Does dural sac cross-sectional area predict the presence of subjective lumbar spinal stenosis symptoms after 10-year follow-up?
- GP193** **Koji Otani** *S. Kikuchi, T. Nikaido, S. Yabuki, S. Konno*  
Cross-sectional and one-year follow-up study for the relationship between lumbar spinal stenosis and low back pain in the community

- GP194** **Toshinori Sakai** *H. Manabe, K. Yamashita, K. Higashino, M. Morimoto, Y. Ishihama, F. Tezuka, Y. Takata, K. Sairyō*  
Bone formation during restoration of rounding vertebral deformity in pediatric spondylolisthesis
- GP195** **Tsuyoshi Kato** *H. Inose, T. Yoshii, A. Okawa*  
Development of a guide for the conservative treatment for acute OVF according to a prospective, randomized, multi-center study by the comparison of rigid and soft-brace treatments
- GP196** **Kinshi Kato** *K. Otoshi, S. Yabuki, K. Otani, T. Nikaido, K. Watanabe, H. Kobayashi, S. Kikuchi, S. Konno*  
Association between core stability and low back pain in high-school baseball players
- GP197** **Mika Hangai** *T. Okuwaki, M. Yamazaki, K. Kaneoka*  
A prevention project for low back disorders in Japanese elite swimmers: 10 years follow-up of lumbar intervertebral disc degeneration
- GP198** **Kazufumi Yamazaki** *S. Kota, D. Oikawa, H. Kawai, Y. Watanabe, Y. Suzuki*  
Poor flexibility is negative predictive factors of bone union in adolescent athletes with spondylolysis
- GP199** **Satoshi Osuka** *T. Ishida, M. Yamanaka, T. Chiba, Y. Koshino, Y. Saito, M. Samukawa, H. Tohyama*  
The Effects of Abdominal Draw-in Maneuver on Electromyographic Activities in Response to a Sudden Release from Loading in Subjects with Non-specific Chronic Low Back Pain
- GP200** **Huan Wang** *C. Yan, Z. Lei, L. Wang, Y. Mu, Y. Liu, S. Wu, S. Cui, G. Jin*  
Automatic segmentation of paravertebral muscle image of lumbar vertebrae MRI by artificial intelligence in young men of northern China
- GP201** **Masahiro Inoue** *S. Orita, K. Inage, Y. Shiga, M. Norimoto, T. Umimura, T. Sato, M. Sato, M. Suzuki, K. Enomoto, S. Maki, T. Furuya, S. Ohtori*  
Comparison of the physical activity of the upper limbs and trunk in patients with low back pain evaluated using a wearable tracker: a validation study
- GP202** **Hirohito Hirata** *T. Morimoto, Y. Nonoue, M. Shiraki, M. Sonohata, M. Mawatari*  
Relationship between the Vitamin D Concentration and Bone Turnover Marker Levels in Patients Undergoing Spinal Surgery.
- GP203** **Daisuke Matsuyama** *D. Sakai, M. Watanabe*  
Prevalence and risk factors for low back pain in male college athletes
- GP204** **Toru Uehara** *E. Tsushima, K. Aoki, S. Yamada, S. Kimura, Y. Satsukawa, A. Inada*  
Paresthesia in the soles of the feet correlates with myelopathy in spinal disease
- GP205** **Masatoshi Hoshino** *S. Ohyama, S. Takahashi, Y. Hori, T. Tsujio, H. Nakamura*  
Significance of vitamin D in low back pain in the elderly
- GP206** **Kinshi Kato** *K. Otoshi, S. Yabuki, K. Otani, T. Nikaido, K. Watanabe, H. Kobayashi, S. Kikuchi, S. Konno*  
Lumbar spine facet joint osteoarthritis in professional athletes
- GP207** **Yoshihiro Kitahama**  
Angiogenesis in a moderately degenerated ligament is one of the causes of ligamentum flavum hematoma
- GP208** **Masao Koda** *K. Miura, T. Abe, T. Funayama, H. Noguchi, M. Yamazaki*  
Protocol for a prospective, one-armed, nonrandomized, un-blinded, safety and feasibility study of exercise therapy using the lumbar type Hybrid Assistive Limb (HAL) for non-specific low back pain
- GP209** **Keita Kitayama** *H. Hashizume, N. Yoshimura, H. Oka, M. Teraguchi, H. Iwahashi, Y. Asai, S. Tsutsui, M. Takami, M. Okada, H. Iwasaki, A. Minamide, Y. Yukawa, S. Tanaka, M. Yoshida, H. Yamada*  
Does the level of occurrence of vertebral body fractures and disc degeneration affect spinal alignment and low back pain? – The Wakayama Spine Study
- GP210** **Stefano Negrini** *B. Piovanelli, M. Gobbo, J. Villafane, S. Donzelli, F. Zaina*  
Paravertebral Muscles Show Cross Activation in Double but also in Single AIS curves, with a Correspondent Oxygen Consumption: An Electromyographic and Near Infrared Spectroscopic Study
- GP211** **Sungbae Park**  
The effect of Runx2 mixed with cell penetrating peptide on differentiation of mesenchymal stem cells into osteoblasts.
- GP212** **Ichiro Okano** *S.N. Salzmänn, C. Rentenberger, C. Ortiz Miller, O.C. Sax, P. Schädler, J. Shue, J.A. Carrino, A.L. Boskey, A.A. Sama, F.P. Cammisa, F.P. Girardi, A.P. Hughes*  
The Associations between Bone Material Properties Measured by Fourier Transform Infrared Spectroscopy (FTIR), Bone Microstructure, and Bone Mineral Density among Caucasian Patients Undergoing Lumbar Spinal Fusion

- GP213** **Takanori Morozumi** *T. Hashikawa, S. Orita, T.A. Lentz, Y. Hagihara, T. Kon, S. Ohtori, S.Z. George, A. Terakado*  
Characteristics of psychological factors in Japanese low back pain patients ~Comparison between Japan and the United States using Comprehensive Psychological Factor Rating Scale (OSPRO-YF)~
- GP214** **Satoshi Kato** *H. Murakami, S. Demura, K. Shinmura, Y. Kurokawa, T. Shimizu, N. Oku, R. Kitagawa, M. Handa, H. Tsuchiya*  
Correlation between osteoporotic vertebral fracture and abdominal trunk muscle strength in the elderly women
- GP215** **Uruj Zehra** *J. Pui Yin Cheung, C. Bow, P. Cheung, D. Samartzis*  
Relationship between spinopelvic parameters and chronic neck, back and multiregional pain
- GP216** **Tomoki Oshikawa** *G. Adachi, H. Akuzawa, K. Kaneoka*  
Feedforward activation of quadratus lumborum is equivalent to that of transversus abdominis during shoulder abduction movement
- GP217** **Kenji Nihej** *Y. Suzukamo, K. Matsudaira, M. Tanabe, S. Izumi*  
Association between low back pain prevalence and work engagement in Japanese hospital workers
- GP218** **Jean-Yves Maigne** *C. Nguyen, G. Mahieu*  
Chronic coccydynia treated conservatively with a 3-year follow up. A series of 120 patients
- GP219** **Naoto Takahashi** *S. Kasahara, S. Yabuki*  
Multidisciplinary pain management program for the patients with chronic low back pain in Japan
- GP220** **Maruf Mohammad Hasib** *K. Yamada, M. Hoshino, K. Tamai, S. Takahashi, A. Suzuki, H. Toyoda, H. Terai, H. Nakamura*  
Can the conventional MRI substitute for the 3D-MRI to diagnose lumbar foraminal stenosis?
- GP221** **Kee-Won Rhyu** *I. Oh, K. Ha, S. Kim*  
Hypertrophy of the Ligament Flavum in Degenerative Lumbar Stenosis Associated with Fibrosis Induced by Macrophage
- GP222** **Ayumu Kawakubo** *M. Miyagi, H. Fujimaki, G. Inoue, T. Nakazawa, T. Imura, W. Saito, K. Uchida, E. Shirasawa, S. Ohtori, K. Inage, M. Takaso*  
Relationship among spinal alignment, bone mineral density, and muscle mass in elderly osteoporosis patients
- GP223** **Emel E Ozcan-Eksi** *M.S. Eksi, M.A. Akcal*  
Severe lumbar intervertebral disc degeneration is associated with Modic changes and fatty infiltration in the paraspinal muscles at all lumbar levels, except L1-L2: A cross-sectional analysis of 50 symptomatic females and age-matched 50 symptomatic males
- GP224** **Gen Adachi** *T. Oshikawa, H. Akuzawa, K. Kaneoka*  
Poor posture causes shoulder girdle muscles hypoactivity and lower back muscles hyperactivity during using a smartphone
- GP225** **Akira Iwata** *M. Kanayama, F. Oha, T. Hashimoto, M. Takahata, N. Iwasaki*  
The importance of mechanical forces affecting for the union of osteoporotic vertebral fracture
- GP226** **Tadatsugu Morimoto** *K. Maeda, H. Hirata, T. Yoshihara, Y. Toda, T. Kobayashi*  
An investigation of infective endocarditis as a complication of vertebral osteomyelitis
- GP227** **Izumi Nobe** *T. Tanno, H. Ataka*  
Analysis of lumbar trunk muscles in healthy volunteers using surface electromyography during postoperative exercise programs for lumbar spine surgery
- GP228** **Shingo Kuroya** *T. Akazawa, M. Iinuma, T. Umehara, Y. Torii, Y. Onose, K. Ishimori, H. Niki*  
Low back pain among 906 nurses :Is the prevalence higher in orthopedics wards?
- GP229** **Emel E Ozcan-Eksi** *M.S. Eksi, M.A. Akcal*  
The Early Bird Catches The Worm: Do paraspinal muscle fatty infiltration and intervertebral disc degeneration start earlier than expected?
- GP230** **Yu Toda** *T. Morimoto, H. Hirata, T. Yoshihara, K. Maeda, M. Sonohata, M. Mawatari*  
The evaluation of computed tomography Hounsfield units before and after treatment of spinal metastatic tumor of lung cancer
- GP231** **Tomoyuki Asada** *T. Kotani, K. Nakayama, T. Sasaki, K. Fujii, T. Sunami, T. Sakuma, Y. Iijima, T. Akazawa, S. Minami, S. Ohtori, M. Koda, M. Yamazaki*  
Japanese version of Bad Sobernheim Stress Questionnaire-Brace for Adolescent Idiopathic Scoliosis patients
- GP232** **Arnold YL Wong** *F. Di Felice, M.T. Chung, H. Pang, S. Negrini, J.P. Cheung, S. Donzelli, F. Zaina, D. Samartzis*  
Is spinal deformity related to the aerobic capacity of patients with adolescent idiopathic scoliosis? A systematic review.

- GP233** **Jason Pui Yin Cheung** G. Leung, P. Cheung, G. Lau, S. Lau, K. Luk, Y. Wong, K. Cheung, P. Koljonen  
An accepting attitude and lack of negative cognition leads to less pain and disability related to chronic low back pain
- GP234** **Takeshi Suzuki** S. Maki, T. Yamauchi, M. Horii, K. Kawamura, M. Aramomi, H. Sugiyama, S. Ohtori  
Prognostic factors for the failure of antibiotic treatment of patients with pyogenic vertebral osteomyelitis
- GP235** **Su Hun Lee** D. Son, K. Kang, D. Son, J. Lee, G. Song  
Association of spinopelvic alignment with lumbar Psoas /erector spinae in 60s women.
- GP236** **Vikas Kapoor** H. Haraluru Jayanna, P. Kumar  
Evaluation of novel controlled thermal energy and rotational capsular tissue shaving system demonstrates clinical benefits in patients suffering from low back facet joint pain at 1-year post treatment
- GP237** **Hikomitsu Toyoda** M. Hoshino, S. Ohyama, H. Terai, A. Suzuki, K. Yamada, S. Takahashi, K. Hayashi, K. Tamai, Y. Hori, H. Nakamura  
The association of back muscle strength and sarcopenia-related parameters in the patients with spinal disorders
- GP238** **Takuya Nikaido** K. Otani, M. Sekiguchi, T. Igari, K. Watanabe, K. Kato, H. Kobayashi, S. Yabuki, S. Kikuchi, S. Konno  
Relationship between degenerative changes in paraspinal muscles and lumbar spinal stenosis in the community
- GP239** **Chang-Hoon Jeon** N. Chung, H. Lee  
Does the volume of herniated disc influence on the spontaneous resorption of lumbar disc herniation and the changes of Oswestry Disability Index?
- GP240** **Arnold YL Wong** M.T. Chung, Y. Zheng, H. Li, D. Samartzis  
Reliability of measuring the volume of multifidi at multiple lumbar levels using two different software programs.
- GP241** **Nobuyuki Fujita** A. Miyamoto, T. Michikawa, S. Suzuki, O. Tsuji, N. Nagoshi, E. Okada, M. Yagi, K. Ishii, H. Kono, T. Tsuji, M. Nakamura, M. Matsumoto, K. Watanabe  
Stride length of elderly patients with lumbar spinal stenosis: Multi-center study using Two-Step test
- GP242** **Fabio Zaina** S. Donzelli, F. Di Felice, A. Caronni, S. Negrini  
Quality of life in scoliosis patients during adulthood: a new evaluation tool
- GP243** **Su Hun Lee** D. Son, K. Kang, D. Son, J. Lee, G. Song  
The relationship between the degeneration of the lumbar muscle and mal-alignment according to Schwab classification
- GP244** **Xu Sun** Q. Zhou, X. Chen, L. Xu, S. Li, C. Du, B. Qian, Z. Zhu, Y. Yu, B. Wang, Y. Qiu  
Compensatory mechanisms in lumbosacral isthmic spondylolisthesis with or without segmental kyphosis
- GP245** **Murat S Eksi** E.E. Ozcan-Eksi, M.A. Akcal  
Prevalence of Thoracic Scoliosis in Adolescents: Analysis of 1065 Chest Radiographs with A Comprehensive Review of Adolescent Scoliosis Prevalence in the World
- GP246** **Nam Vo** C. Zhou, C. Tomkins-Lane, G. Sowa, N. Merzlak  
Neuropeptide Y associations with lifestyle interventions in subjects with lumbar spinal stenosis
- GP247** **Arnold YL Wong** H. Pang, S. Negrini, F. Zaina, M.T. Chung, S. Donzelli, F. Di Felice, J.P. Cheung, D. Samartzis  
The associations between spinal deformities and pulmonary functions in conservatively treated patients with adolescent idiopathic scoliosis – A systematic review and meta-analysis.
- GP248** **Keita Sato** T. Ito, R. Tominaga, T. Endo, J. Omata, T. Miura, M. Iwabuchi, O. Shirado  
Dynamic spinal alignment can influence on continuous walkable distance in the patients with adult spinal deformity
- GP249** **Sang-II Kim** Y. Kim, K. Ha, H. Park, H. Min  
Significance of spine metastasis as initial presentation in patients with short predicted survival
- GP250** **Koichi Sairyo** K.K. Yamashita, K. Higashino, H. Manabe, K. Sugiura, Y. Ishihama, F. Tezuka, Y. Takata, T. Sakai  
Reducing mechanical stress restores the rounding deformity in a rat model of immature pediatric spondylolisthesis: Is a pediatric spinal deformity reversible condition?
- GP251** **Yoshinobu Hagihara** T. Kon, A. Terakado  
Selective Nerve Root Block for Lumbar Spine Disease

- GP252** **Seung-Hwan Lee** *C. Lee, J. Yang, H. Lee*  
Relationship between cervical balance and neck muscle degeneration
- GP253** **Shinji Tanishima** *H. Matsumoto, H. Hagino, H. Nagashima*  
Relationship among osteoporosis, sarcopenia, locomotive syndrome, and spinal kyphosis in elderly living in a local mountain area
- GP254** **Yudai Kumano** *M. Fukushima, Y. Toda, S. Yamamoto*  
Assessment of lumbar changes over 8 years in hemodialysis patients
- GP255** **Anne F Mannion** *F. Mariaux, T.P. Fekete, D. Haschtmann, M. Loibl, F.S. Kleinstück, F. Porchet, D. Jeszenszky, A. Elfering*  
Development of the brief "Core Yellow Flags Index" (CYFI) for the baseline assessment of psychological status in patients undergoing spine surgery
- GP256** **Yuyu Ishimoto** *M. Kawakami, M. Teraguchi, K. Horie, Y. Nakagawa*  
Lumbar spinal stenosis, knee osteoarthritis and loss of lumbar lordosis have an impact on quality of life: findings from the Katsuragi Low Back Pain Study
- GP257** **Daniel L Belavy** *P.J. Owen, H. Mika, K. Kaneoka, T. Rantalainen*  
Examining the sport-specific impact on intervertebral disc degeneration: a cross-sectional analysis of 308 athletes
- GP258** **Satoshi Maki** *T. Suzuki, T. Furuya, T. Yamauchi, Y. Shiga, K. Inage, S. Orita, S. Ohtori*  
Lumbar facet effusion and paraspinal edema in the patients with lumbar spondylodiscitis
- GP259** **Kinshi Kato** *K. Otoshi, S. Yabuki, K. Otani, T. Nikaido, K. Watanabe, H. Kobayashi, S. Kikuchi, S. Konno*  
Development and enlargement of ossification of the ligamentum flavum in the thoraco-lumbar spine in Asian professional baseball players: comparison with age- and sex-matched control subjects
- GP260** **Douglas G Chang** *A. McCarthy, W.I. Chun, S.C. Baxi, E.J. Groessl*  
Physical and Mental Health Outcomes in a Randomized Controlled Trial of Yoga for Chronic Low Back Pain in Veterans
- GP261** **Jason Pui Yin Cheung** *K. Fok*  
Changes in sagittal alignment in upslope or downslope: An insight into dynamic spinal stenosis symptomatology
- GP262** **Tomohiro Banno** *T. Hasegawa, Y. Yamato, D. Togawa, G. Yoshida, H. Arima, S. Oe, Y. Mihara, H. Ushirozako, T. Yamada, Y. Matsuyama*  
Short time clinical outcome of Chondriase injection therapy for lumbar disc herniation
- GP263** **Claudio Vergari** *I. Courtois, E. Ebermeyer, R. Pietton, H. Bouloussa, R. Vialle, W. Skalli*  
Effects of bracing on head and pelvis sagittal alignment in adolescent idiopathic scoliosis
- GP264** **Zhe Wang** *X. Hu, C. Dai*  
The influence of the low-level laser on polarization of bone marrow-derived macrophage
- GP265** **Shintaro Shoji** *G. Inoue, M. Miyagi, W. Saito, K. Uchiyama, T. Nakazawa, T. Imura, K. Fukushima, E. Shirasawa, K. Uchida, N. Takahira, M. Takaso*  
Impact of Total Hip Arthroplasty for Low Back Pain and Radiological Spinopelvic Sagittal Parameters in Patients with Hip Diseases
- GP266** **Kazushige Koyama** *K. Wada, G. Kumagai, H. Kudo, T. Asari, Y. Ishibashi, S. Nakaji*  
The association between narrow cross-sectional area of lumbar dural sac and lower limb numbness in a Japanese population
- GP267** **Naritoshi Sato** *M. Kanda, T. Kitamura, K. Watanabe*  
Intramuscular oxygenation of lumbar multifidus in different trunk positions in sitting
- GP268** **Shinji Tanishima** *H. Matsumoto, H. Hagino, H. Nagashima*  
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- GP269** **Jun-Yeong Seo** *K. Ha, y. Kim*  
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Relationship between hip muscle flexibility and low back pain during lumbar flexion and extension
- GP271** **Koji Otani** *S. Kikuchi, T. Nikaido, S. Konno*  
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Comparative analysis of sarcopenia and back muscle degeneration in back pain and new risk index of back muscle degeneration

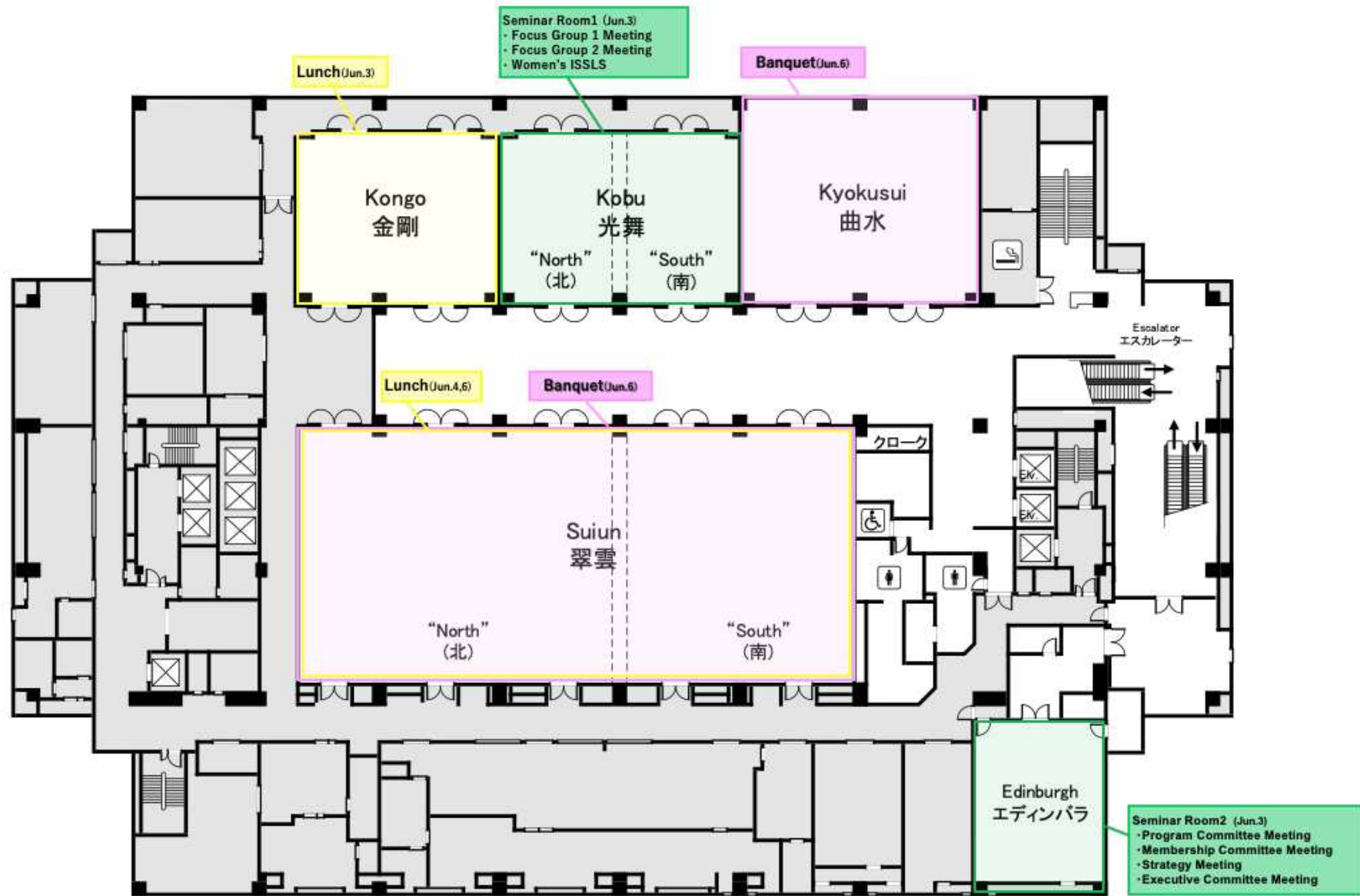
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Therapeutic effects of gefitinib-encapsulated thermosensitive injectable hydrogel in intervertebral disc degeneration
- GP274** **Eiki Shirasawa** *G. Inoue, M. Miyagi, W. Saito, T. Imura, T. Nkazawa, S. Shoji, M. Takaso*  
The effect of total hip arthroplasty on the low back pain and lumbar spine function in hip patients with or without scoliosis in lumbar spine.
- GP275** **Yoshinobu Hagihara** *T. Kon, A. Terakado*  
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- GP276** **Joseph F Baker** *A.S. Don, P.A. Robertson*  
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A new classification of micro-damaged cartilaginous endplates in the degenerative discs
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Function of MMP12 In Myofibroblastic Differentiation of NP Cells And Disc Degeneration
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A Resource Efficient Novel MRI Post Processing Technique for the Assessment of Intervertebral Disc Degeneration - Correlation with Histological Grading in a Rabbit Disc Regeneration Model.
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The effect of GDF6 in reducing intervertebral disc degeneration and inflammation-related pain in a rat model
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Potential Involvement of Semaphorin 3A in Maintaining Tissue Homeostasis of Intervertebral Disc
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Autophagy in an extruded disc compared to the remaining disc after lumbar disc herniation in the same patient
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Promoting nucleus pulposus progenitors-like differentiation from mesenchymal stem cells via MAP kinase coupled chondrogenic induction
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Scaffold-Free Tissue Engineering with Aligned Bone Marrow Stromal Cells Sheets to Recapitulate the Microstructural and Biochemical Composition of Annulus Fibrosus
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Repetitive Changes in Hydrostatic Pressure at High Osmotic Pressure Have a Potential to Reproduce Homeostasis in Human Nucleus Pulposus
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Role of DUSP1 on the regulation of NGF and MMPs in human intervertebral disc cells
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Endplate cartilage avulsion during percutaneous endoscopic discectomy: presence in herniated disc, associations with Modic changes and endplate defects.

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DUSP1 regulates autocrine positive feedback loop of interleukin (IL)-1 in human intervertebral disc
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Crocin exhibits anti-inflammatory effects by suppressing the activation of JNK in IL-1 $\beta$  treated human annulus fibrosus cells.
- GP295** **Yuji Kakiuchi** T. Yurube, K. Kakutani, T. Takada, M. Ito, Y. Takeoka, Y. Kanda, R. Tsujimoto, Z. Zhang, S. Miyazaki, R. Kuroda, K. Nishida  
Selective mTORC1 inhibition by temsirolimus protects human disc nucleus pulposus cells through Akt and autophagy induction
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The Role of Periostin in Osteoporosis
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Involvement of autophagy in human lumbar spine degenerated and herniated disc diseases
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Hepatocyte growth factor promotes nucleus pulposus cell proliferation with HIF-1 $\alpha$  expression.
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Shox2 inhibits inflammatory response in nucleus pulposus cells and intervertebral disc degeneration associated pain behavior in vivo
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A link of disc degeneration to increased myofibroblast and fibrocyte-like activity
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TSCmKO kyphosis mice model – muscle loss induced intervertebral disc degeneration
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FoxA2Regulates Nucleus Pulposus-Like Differentiation of Adipose-Derived Stem Cells by Activation of The Shh Signaling Pathway
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MSCs secretome decreases matrix degrading activity of anulus fibrosus cells under mechanical loading and an inflammatory environment
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Sensory innervation of the lumbar intervertebral disc in mice: nerve types, origins, and differences with rats
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Evaluation of Gait Characteristics Using Acceleration Sensor for Patients with Lumbar Spinal Stenosis
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Changes in Adjacent Segment Kinematics After Lumbar Decompression and Fusion are Patient-Specific
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Personalized regenerative medicine in spine surgery: stem cells from vertebral body
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The greater the difference of global spino-plevic alignment between supine and standing positions, the worse the low back pain disability in the patients with adult spine deformity
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Establishment of a novel measurement technique for pedicle screw stability: Laser resonance frequency analysis: a cadaveric study
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Independent validation of a machine learning based spinal MRI grading system on the Finnish population cohort
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Immediate changes in chest mobility and trunk muscle activity following different trunk muscle exercises
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Biomechanical comparison of anterior column realignment and pedicle subtraction osteotomy for severe sagittal imbalance correction
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Sarcopenia affecting low back pain in patients with lumbar spinal stenosis

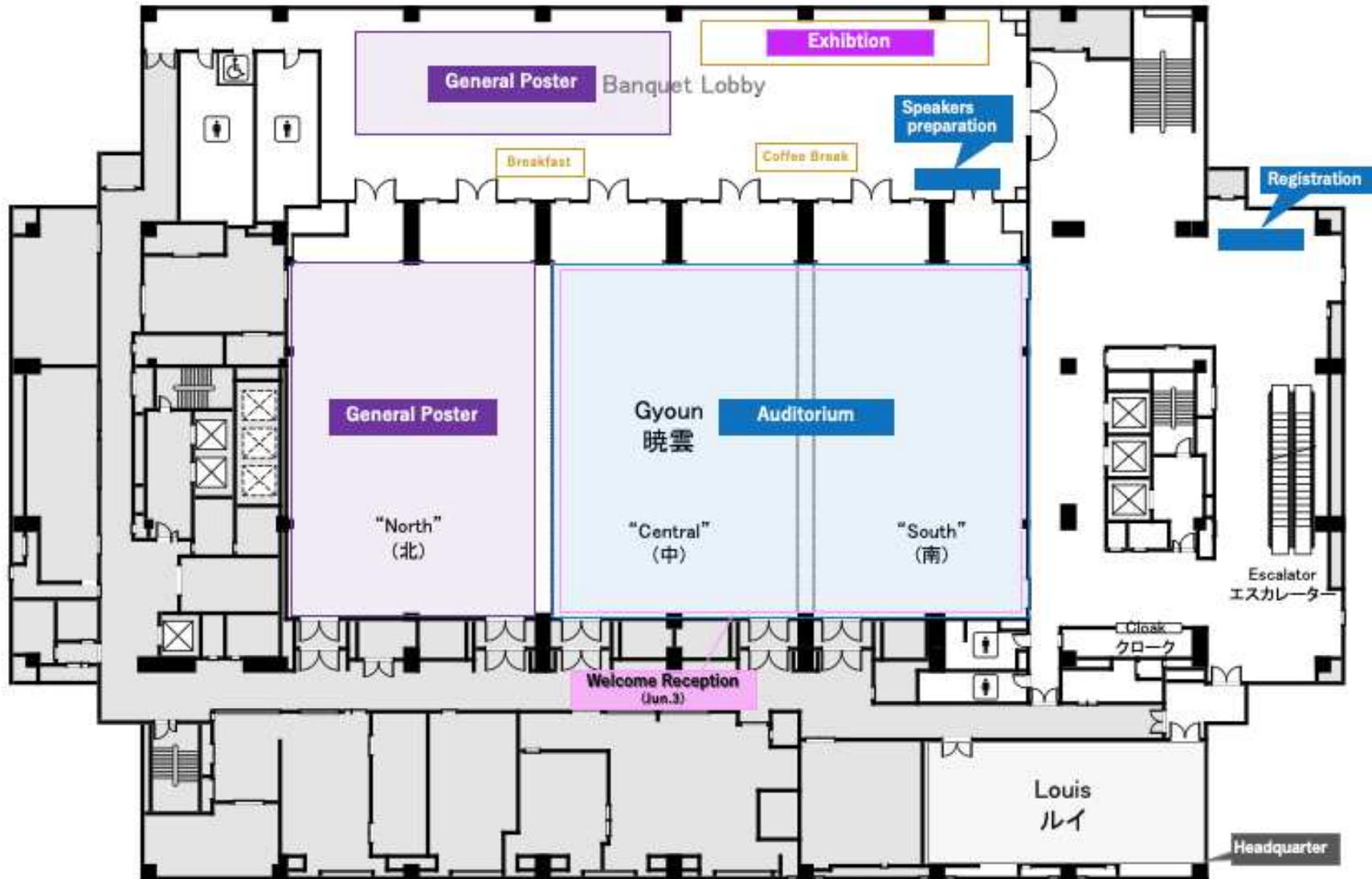


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810 nm low level laser therapy down-regulate the activation and secretion of astrocyte by altering the polarization of macrophage
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The Relationship between Degree of Scoliosis and Body Composition In Adolescent Idiopathic Scoliosis
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A Role for Toll-Like Receptors in Degenerating Scoliotic Facet Joints
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The pelvic incidence value is inversely correlated with the true acetabular anteversion angle value
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Estimation of a Density-Elastic Modulus Equation for Improved Vertebral Fracture Risk Prediction
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Biomechanical stability of pedicle versus cortical screws in the lumbar spine
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Length of Fusion is a Significant Risk Factor In Development of Adjacent Disc Disease in a normal and osteoporotic Lumbar Spine : A Finite Element Study
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Associations between accumulated Advanced Glycation End-products, revealed by skin autofluorescence, and chronic low back pain
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Paravertebral muscles metabolism changes with age in agreement with EMG particularly at L4-5, less at higher levels: a Near Infrared Spectroscopy (NIRS) evaluation
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Thoracic kyphosis and pelvic anteversion increases during walking in patients with adult spinal deformity: analyses of dynamic alignment change with three-dimensional gait motion analysis system
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Sagittal spinal malalignment is a risk factor of positional pelvic retroversion
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Exploring the anthropometric parameters for improving reliability of estimation model of pelvic incidence
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Biomechanical advantages of multi-rods and interbody cages for the stabilization of pedicle subtraction osteotomy: an in vitro study
- GP328** **Kenji Endo** *H. Suzuki, Y. Matsuoka, T. Takamatsu, H. Nishimura, Y. Sawaji, T. Kusakabe, A. Maekawa, T. Aihara, K. Yamamoto*  
The classification of lumbopelvic sagittal alignment based on the difference between standing and sitting position
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Gait features for discriminating between mobility-limiting musculoskeletal disorders: lumbar spinal stenosis and knee osteoarthritis
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A pilot study of forward bending, lateral flexion and axial rotation of the spine in healthy subjects
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Three-dimensional assessment of the lumbar spine motion in vivo using the EOS stereography system : intra- and inter- observer reproducibility study
- GP332** **Qingan Zhu** *R. Zhou, Z. Huang*  
Biomechanical comparison of degenerative spondylolisthesis models between L4-L5 and L5-S1 segments
- GP333** **Ji Tu** *A. Diwan, C. Yang, W. Li*  
Sestrins inhibits stress-induced intervertebral disc degradation by enhancing autophagy
- GP334** **Ji Tu** *A. Diwan, C. Yang, W. Li*  
Simvastatin Inhibits IL-1 $\beta$ -Induced Apoptosis and Extracellular Matrix Degradation by Suppressing the NF- $\kappa$ B and MAPK Pathways in Nucleus Pulposus Cells

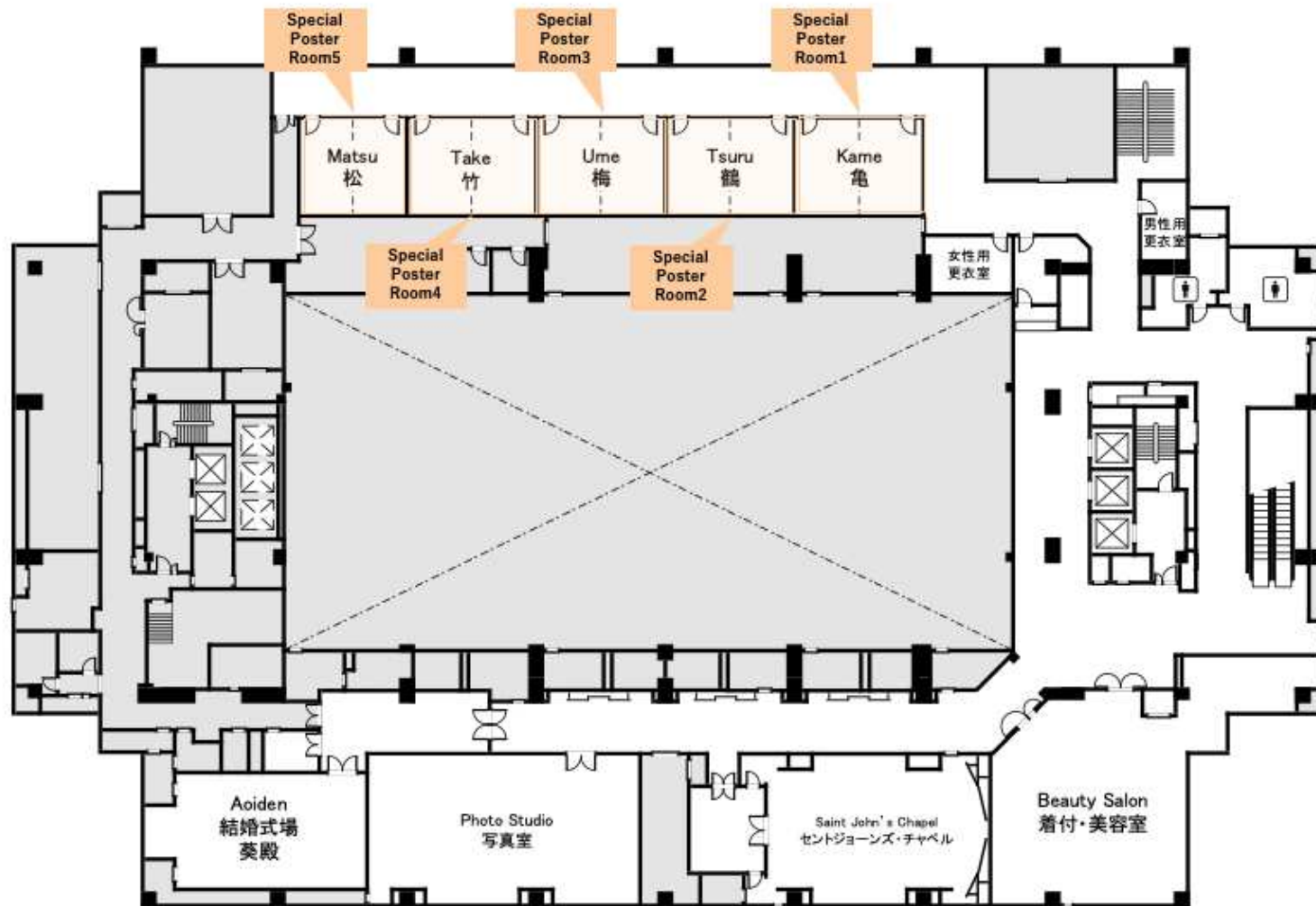
# 3rd Floor Plan



# 4<sup>th</sup> Floor Plan



# 5<sup>th</sup> Floor Plan



## ACKNOWLEDGEMENT

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We wish to acknowledge the following ISSLS members who have been a great help in reviewing the abstracts submitted for the ISSLS annual meeting in Kyoto, Japan.

Aaron Fields	Jill Urban	Shinichi Konno
Akihiko Hiyama	Jiri Dvorak	Si Young Park
Alastair Gibson	John Cunningham	Stefano Negrini
Alison McGregor	John Glaser	Stephane Genevay
Andrew Schoenfeld	Joo Han Kim	Stephen Brown
Anne F Mannion	Junseok Bae	Sumihisa Orita
Ashish Diwan	Katsuhiko Sato	Svenja Illien-Junger
Asseem Sharma	Kazuhide Inage	Tamas Fekete
Atsushi Fujiwara	Kazuhiro Hasegawa	Teija Lund
Benjamin Gantenbein	Kazuyuki Watanabe	Tim Yoon
Björn Strömqvist	Keita Ito	Tomohiro Miyashita
Brook Martin	Kenji Endo	Toru Hasegawa
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Dietrich Schlenzka	Marinko Rade	Yasuchika Aoki
Donna Ohnmeiss	Masato Nakano	Yong Hai
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Emel Ozcan-Eksi	Masayuki Miyagi	Youssef Masharawi
Fabio Galbusera	Masumi Iwabuchi	Yue Wang
Fabio Zaina	Mauro Alini	Yuyu Ishimoto
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Jaro Karppinen	Satoshi Ogihara	
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