Final Programme
#ICRSFOCUSMEETING

Austria
Vienna
November 21–22, 2019

Focus Meeting
See What You Can Do
Imaging, Diagnosis, Treatment
Our mission is to improve quality of life through innovative solutions for allograft joint repair.

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- Provide intact hyaline cartilage, viable chondrocytes, and subchondral bone
- Single step treatment with no patient size matching required
- A great alternative for focal lesions of 20 mm or less

**PRESUTURED TENDONS**
- Excellent option for any ligament repair procedure
- Eliminates time to assemble the construct
- Consistent graft quality

**DISTAL TIBIA**
- Restores glenoid with live cartilage and strong bone
- No size match required
- Eliminates morbidity of autograft latarjet

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Dear Colleagues & Friends,

Cartilage treatment and imaging technology has emerged during the last 50 years. Cartilage repair, biotechnology and cell transplantation, as well as fundamental research in molecular biology and genetics have changed the understanding of how to address the problem of non-healing articular cartilage. In MRI technology and radiology, the morphologic assessment of structures has been developed to a more functional and quantitative analysis of tissue structures. Both fields have influenced each other and are depending on each other in indication and follow-up of outcomes of surgical procedures in patients suffering from diseased articular cartilage. What we are seeing on radiology or MRI images is influencing our strategy in treatment, and what we are doing to repair or regenerate tissue defects in the joint is producing outcomes clinically as well as morphologically in our radiological follow-up. These two paradigms of seeing what we can do and doing what has to be done was the background of developing the idea of this focus meeting. The aim of this Focus Meeting is to discuss the value of semi quantitative morphological and compositional MR in diagnosis, selection of patients for the right treatment and to monitor the efficacy of different cartilage surgery techniques.

Throughout the last 30 years cartilage repair technology and imaging technology has been developed at the Medical University of Vienna & Danube University Krems. Siegi Trattnig and Stefan Nehrer have been at the forefront of establishing that high standard treatment and diagnosis in Austria. Especially, the establishment of the MRI research centre with a 7 Tesla MR scanner has allowed innovative ways to analyse cartilage repair. So, it is a great pleasure to welcome the ICRS society to Vienna to discuss state-of-the-art and further developments on an international platform like ICRS. The historical charm of Vienna and vibrant life of this modern city will be a nice background to enjoy this meeting and foster social activities especially at the beginning of Vienna’s Christmas Season.

Sincerely

Stefan Nehrer, Danube University Krems, Center for Regenerative Medicine
Siegfried Trattnig, Medical University of Vienna, MR Center, Department of Radiology
Biologic approaches to tissue repair and regeneration represent the future in healthcare worldwide.
Aesculap Biologics is leading the way.
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ACKNOWLEDGMENT

The ICRS acknowledges the following Industry Partners for their generous & continued support

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- the exact value of the dynamic Q angle that can predict vulnerability for ACL tear

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**Course Organising Office**
Cartilage Executive Office GmbH  
Spitalstrasse 190 – Haus 3  
8623 Wetzikon Switzerland  
Phone +41 44 503 73 70  
Email: office@cartilage.org

**Invited Faculty**
- Bobic Vladimir, Chester (UK)  
- Bohndorf Klaus, Augsburg (DE)  
- Chiari Catarina, Vienna (AT)  
- Erggelet Christoph, Zurich (CH)  
- Farr Jack, Greenwood (US)  
- Filardo Giuseppe, Bologna (IT)  
- Gersing Alexandra, Munich (DE)  
- Gobbi Alberto, Milan (IT)  
- Jungmann Pia, Freiburg (DE)  
- Juras Vladimir, Vienna (AT)  
- Kainberger Franz, Vienna (AT)  
- Kon Elizaveta, Milan (IT)  
- Lattermann Christian, Boston (US)  
- Link Thomas, San Francisco (US)  
- Marlovits Stefan, Vienna (AT)  
- Minas Tom, West Palm Beach (US)  
- Mlynarik Vladimir, Vienna (AT)  
- Nakamura Norimasa, Osaka (JP)  
- Nehrer Stefan, Krems (AT)  
- Neubauer Markus, Krems (AT)  
- Niemeyer Philipp, Munich (DE)  
- Raudner Marcus, Vienna (AT)  
- Redl Heinz, Vienna (AT)  
- Roemer Frank, Erlangen (DE)  
- Shabshin Nogah, Ra’anana (IL)  
- Sladik Boguslaw, Bielsko-Biała (PL)  
- Stotter Christoph, Krems (AT)  
- Szomolanyi Pavol, Vienna (AT)  
- Trattnig Siegfried, Vienna (AT)  
- Welsch Goetz, Hamburg (DE)

**Course Directors**
- Prof. Siegfried Trattnig, MD  
  Department of Biomedical Imaging & Image Guided Therapy  
  Medical University of Vienna, Austria
- Prof. Stefan Nehrer, MD  
  Danube University Krems  
  Center for Regenerative Medicine  
  Krems, Austria

**Course Venue**
Medical University Vienna  
Van Swieten Room  
Van Swieten – Gasse 1a, 1090 Vienna, Austria

**Venue Imaging Workshop**  
Medical University of Vienna  
High Field MR Center  
Lazarettgasse 14, 1090 Vienna, Austria

**Venue Surgical Skills Workshop**  
Medical University of Vienna  
Center for Anatomy and Cell Biology  
Währinger Straße 13, 1090 Vienna, Austria

**Official Course Hotel**  
Hotel Regina  
Rooseveltplatz 15, Vienna, Austria  
www.kremslehnerhotels.at/en/hotel-regina-vienna/  
Tel: +43 1 404 46 0  
Email: regina@kremslehnerhotels.at

**Faculty / Course Dinner (90 EUR)**  
Palais Todesco  
Kärntner Str. 51, 1010 Wien, Austria
### Thursday, 21 November 2019

#### 7:30–12:30 Pre-Course: Surgical Skills

(Center for Anatomy & Cell Biology, Medical University of Vienna)

Instructors: Nehrer Stefan (AT), Farr Jack (US), Niemeyer Philipp (DE), Nakamura Norimasa (JP), Gobbi Alberto (IT), Erggelet Christoph (CH), Bobic Vladimir (UK), Stotter Christoph (AT), Neubauer Markus (AT)

<table>
<thead>
<tr>
<th>Time</th>
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<tr>
<td>07:30</td>
<td>Welcome &amp; Badge Pick-Up</td>
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<tr>
<td>07:30</td>
<td>Assessment Cartilage Defect: Debridement Technique Grading – Farr Jack (US)</td>
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<tr>
<td>07:40</td>
<td>Treatment Strategy &amp; Indication – Erggelet Christoph (CH)</td>
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<td>07:50</td>
<td>Bone Marrow Stimulation: Microfracture, Microdrill, Nanofracture – Nakamura Norimasa (JP)</td>
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<td>08:00</td>
<td>Biomaterial Augmentation: AMIC (Geistlich) – Bobic Vladimir (UK)</td>
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<td>08:10</td>
<td>Knee Biomaterial Augmentation: Hyalofast (Anika) – Gobbi Alberto (IT)</td>
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<td>08:20</td>
<td>Ankle Biomaterial Augmentation: Hyalofast (Anika) – Nehrer Stefan (AT)</td>
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<td>08:30</td>
<td>ACT Cell Transplantation: Spherox (Co.Don) – Niemeyer Philipp (DE)</td>
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<td>08:40</td>
<td>All Autologous Cartilage Repair – Boszotta Laurin (AT)</td>
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<tr>
<td>08:45</td>
<td>Chondrektoms – New Surgical Instruments – Sladik Boguslaw (PL)</td>
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<tr>
<td>09:00</td>
<td>Coffee Break / Lab Organization</td>
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<tr>
<td>09:30</td>
<td>Hands-on Skills Knee: Defect Preparation BMS, AMIC, Hyalofast, Spherox</td>
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<tr>
<td>11:15</td>
<td>Hands-on Skills Ankle: Defect Preparation BMS, AMIC, Hyalofast, Spherox</td>
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#### 9:00–12:00 Pre-Course: Imaging Skills

(High Field MR Center, Medical University Vienna)

Instructors: Juras Vladimir (AT), Trattnig Siegfried (AT), Szomolanyi Pavol (AT), Raudner Marcus (AT)

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<tr>
<td>09:00</td>
<td>Welcome &amp; Badge Pick-Up</td>
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<tr>
<td>09:15</td>
<td>Part 1 – Morphological Cartilage Imaging</td>
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<tr>
<td>09:15</td>
<td>Basic Morphological MR of Cartilage, Optimization of Protocols – Trattnig Siegfried (AT)</td>
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<tr>
<td>09:30</td>
<td>MR Case Studies of Cartilage Degeneration and Injuries with Staging – Trattnig Siegfried (AT)</td>
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<td>09:45</td>
<td>The MOCART Score 2.0 What is new Compared to the Original MOCART – Raudner Marcus (AT)</td>
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<tr>
<td>10:00</td>
<td>The MOCART Score 2.0: Complimentary Atlas &amp; Case Presentations – Raudner Marcus (AT)</td>
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<tr>
<td>10:30</td>
<td>Part 2 – Compositional Cartilage Imaging</td>
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<tr>
<td>10:30</td>
<td>T2 Mapping from Sequence to Postprocessing to Clinical Trials – Szomolanyi Pavol (AT)</td>
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<tr>
<td>11:00</td>
<td>GLCM with T2 Mapping – What is it and How to do it – Juras Vladimir (AT)</td>
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<tr>
<td>11:30</td>
<td>How to Image GAG – Trattnig Siegfried (AT)</td>
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### 10:00–13:00  Focus Meeting Registration (Van Swieten Room)

### 12:00–13:00  Welcome Lunch Reception / Refreshments

### 13:00–14:30  Module 1 – Background

**Moderators:** Trattnig Siegfried (AT), Nehrer Stefan (AT)

- **13:00**  
  **1.1 Introduction: See what you can do, what you have done!**  
  Nehrer Stefan (AT) Trattnig Siegfried (AT)

- **13:15**  
  **1.2 Morphological Imaging State of the Art**  
  Link Thomas (US)

- **13:30**  
  **1.3 Compositional MR Imaging**  
  Mlynarik Vladimir (AT)

- **13:45**  
  **1.4 Artificial Intelligence in Cartilage Imaging Methods**  
  Juras Vladimir (AT)

- **14:00**  
  **1.5 Digitized X-Ray Analysis of OA**  
  Nehrer Stefan (AT)

- **14:15**  
  Panel Discussion

### 14:30–15:15  Coffee Break / Exhibition / Networking

### 15:15–16:45  Module 2 – Diagnosis

**Moderators:** Shabshin Nogah (IL), Gobbi Alberto (IT)

- **15:15**  
  **2.1 Chondral vs. Osteochondral Lesions**  
  Bohndorf Klaus (DE)

- **15:30**  
  **2.2 Bone Marrow Edema, Osteonecrosis**  
  Shabshin Nogah (IL)

- **15:45**  
  **2.3 Correlation Arthroscopic & MRI Defect Assessment**  
  Gobbi Alberto (IT)

- **16:00**  
  **2.4 Imaging Correlation with Clinical Symptoms**  
  Welsch Goetz (DE)

- **16:15**  
  **2.5 Focal OA vs. Generalized OA**  
  Roemer Frank (DE)

- **16:30**  
  Panel Discussion: See Your Diagnosis

### 16:45–17:30  Module 3 – Case Discussions

**Moderators:** Nehrer Stefan (AT), Trattnig Siegfried (AT)

### 19:00–23:00  Faculty / Course Dinner

At Palais Todesco

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Take in the success of the ICRS Focus Meeting while enjoying an imperial atmosphere and delicious culinary options. Seize this unique opportunity and get together with our faculty experts. Extend your networking with your international peers and colleagues in an inspiring ambience. This magnificent Neo-Renaissance building, located right next to the Vienna State Opera, was built on behalf of the banker, Eduard Freiherr von Todesco, in the years 1861 to 1864. **Dinner Ticket Price: 90 Euros**
Friday, 22 November 2019

08:30–10:00  Module 4 – Outcomes 1: Results & Imaging
Moderators: Welsch Goetz (DE), Nakamura Norimasa (JP)

08:30  4.1 MR Outcome Score, MOCART 2.0
Trattnig Siegfried (AT)

08:45  4.2 Cartilage Repair Outcome in the Athlete
Welsch Goetz (DE)

09:00  4.3 Cartilage Registry & the Role of Imaging
Niemeyer Philipp (DE)

09:15  4.4 Is Quantitative MRI good enough to Evaluate Cartilage Repair Quality?
Nakamura Norimasa (JP)

09:30  4.5 Relation of Imaging & Clinical Symptoms
Bobic Vladimir (UK)

09:45  Panel Discussion: See What You Have Done

10:00–10:45  Coffee Break / Exhibition / Networking

10:45–12:15  Module 5 – Outcomes 2: Results & Imaging
Moderators: Kon Elizaveta (IT), Roemer Frank (DE)

10:45  5.1 Microfracture and AMIC Techniques
Niemeyer Philipp (DE)

11:00  5.2 Fat & Bone Marrow Concentrate, MSC Techniques
Nakamura Norimasa (JP)

11:15  5.3 ACT, MACI
Minas Tom (US)

11:30  5.4 Mosaicplasty, Allografts
Link Thomas (US)

11:45  5.5 Osteochondral Repair/ Biomaterials
Kon Elizaveta (IT)

12:00  5.6 Appearance of Different Cartilage Repair Techniques on MRI
Gersing Alexandra (DE)

12:15–13:30  Lunch Break / Industry Symposium
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<th>Time</th>
<th>Module</th>
<th>Title</th>
<th>Speaker</th>
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<tr>
<td>13:30</td>
<td>Module 6 – Concomitant Damage &amp; Background Factors</td>
<td>6.1 Predictive Marker in Cartilage Damage</td>
<td>Lattermann Christian (US)</td>
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<td>13:45</td>
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<td>6.2 OA Outcomes in MRT</td>
<td>Roemer Frank (DE)</td>
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<td>14:00</td>
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<td>6.3 Associated Meniscus &amp; Ligament Lesions – Clinical</td>
<td>Farr Jack (US)</td>
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<td>14:15</td>
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<td>6.4 Associated Meniscus &amp; Ligament Lesions – Imaging</td>
<td>Kainberger Franz (AT)</td>
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<td>14:30</td>
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<td>6.5 Cartilage Damage in the Adolescence</td>
<td>Chiari Catharina (AT)</td>
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<td>14:45</td>
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<td>Panel Discussion: Associated Damage &amp; Confounding Factors</td>
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<td>15:00</td>
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<td>Coffee Break / Exhibition / Networking</td>
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<tr>
<td>15:30</td>
<td>Module 7 – Evidence Based Medicine Study Designs</td>
<td>7.1 Regulation Issues in Cartilage Repair</td>
<td>Marlovits Stefan (AT)</td>
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<td>15:45</td>
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<td>7.2 Evidence in Cartilage Repair – Imaging</td>
<td>Jungmann Pia (DE)</td>
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<td>16:00</td>
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<td>7.3 Histology &amp; Imaging, Experimental &amp; Clinical</td>
<td>Redl Heinz (AT)</td>
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<td>16:15</td>
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<td>7.4 See What You Can Expect in Cartilage Treatment</td>
<td>Filardo Giuseppe (IT)</td>
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<td>16:30</td>
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<td>Panel Discussion: How to Prepare Study Designs for Cartilage Multicentre Trials</td>
<td>Kon Elizaveta (IT)</td>
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<tr>
<td>16:45</td>
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<td>Closing Remarks &amp; Take-Home Points</td>
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INTERNATIONAL FACULTY

Bobic Vladimir, Prof., MD, FRCSEd
Nuffield Health, The Grosvenor Hospital Chester, Chester, United Kingdom
Professor Vladimir Bobic is a Consultant Orthopaedic Knee Surgeon in full-time clinical and surgical practice. He is the director and founder of Chester Knee Clinic and Cartilage Repair Centre. The clinic, founded in 1996, is based at the Grosvenor Hospital in Chester, UK, where it is recognised as an ISAKOS-approved teaching centre. Professor Bobic has over twenty-three years of extensive experience in all aspects of knee surgery, including arthroscopic surgery, ligament reconstruction, knee arthroplasty, and particularly in articular cartilage repair. He is involved in national and international collaborative clinical and basic science research related to knee articular cartilage imaging, repair, rehabilitation and functional outcomes. His clinical and surgical practice includes all contemporary articular cartilage repair technologies, including stem cell therapies. He organised one of the first UK seminars on the use of Autologous Stem Cell Therapies in Orthopaedics which was held in Chester in June 2013. He has over twenty years of experience in clinical and arthroscopic imaging, including digital image and video editing, and over sixteen years of experience in clinical and MR digital imaging of articular cartilage and subchondral bone. Prof Bobic introduced the first web-based MRI Teleradiology units at the Grosvenor Nuffield Hospital in Chester in 2004, in collaboration with Dr David Ritchie, Consultant Musculoskeletal Radiologist, Kodak and Alliance Medical. He is one of the founding members of the ICRS and a founder and former chairman of the ICRS Articular Cartilage Imaging and Rehabilitation Committees. He continues to focus on articular cartilage repair and autologous biological treatment options, which are his main clinical, imaging and research interests.

Bohndorf Klaus, Prof., MD
Klinikum Augsburg, Augsburg, Germany
Klaus Bohndorf graduated from the University of Kiel/Germany with the degree in Medicine. After his residency in Radiology in Hamburg, London and Köln, he became Associate Professor at the Department of Radiology in Aachen. In 1992 he was appointed full Professor. From 1992-2013 he served as the Director of the Department of Radiology at the Klinikum Augsburg. His educational and scientific activities are focussing on Musculoskeletal Radiology. Klaus Bohndorf organized national and international congresses and held posts as President of the European Society of Musculoskeletal Radiology and the International Skeletal Society. He has received several awards. His bibliography comprises 7 books, 23 book chapters and 201 articles (indexed in pub med). Currently he is working as a senior advisor at the Department of Radiology at the University Hospital in Halle/Saale, Germany

Chiari Catharina, Ass Prof., MD, MSc
Medical University of Vienna, Vienna, Austria
Prof. Dr. Catharina Chiari is an Orthopaedic Surgeon at the Department of Orthopaedics and Traumatology, Medical University of Vienna, Austria. She is head of the Cartilage Repair Clinic and head of the Pediatric Orthopaedic Team. She received her MD at the University of Vienna in 1998 and completed her orthopaedic residency in 2005. She became Associate Professor in 2009 and Master of Science in Advanced Orthopaedic Surgery in 2013. Catharina Chiari is deputy head of the orthopaedic research department, which includes a cell biology lab and a lab for biomechanical research. Her prior research was focused on cartilage repair and meniscus tissue engineering, recently she was involved in the EU funded Osteogrow project dealing with bone healing enhanced by BMP 6. She is running several clinical studies on cartilage repair techniques. She received several awards and was a travelling fellow to Korea and Japan of the Society for Orthopaedic Traumatologic Sports Medicine in 2006 and won the ASG fellowship 2011. She completed a 6 months research fellowship at the International Center for Limb Lengthening in Baltimore, USA, in 2008. Catharina Chiari is a member of the ICRS since 2005 and was part of the local organizing committee of the first ICRS surgical skills course in Vienna 2005.
Erggelet Christoph, Prof., MD, PhD
Alfaclinic, Zurich, Switzerland

Christoph Erggelet is an orthopaedic surgeon in Zurich/Switzerland affiliated with the Department for Orthopaedic Surgery and Traumatology, University Medical Center, University of Freiburg/Germany. He received his MD in 1986 and passed the board exam for Orthopaedic Surgery in 1993. A PhD was granted by the University of Essen/Germany in 1987. Since 2002 he is Faculty member of the University Medical School, University of Freiburg Germany. Research interests focus on biologic regeneration of joint function, e.g. culture of autologous chondrocytes, meniscus regeneration and ligament repair. He served as a founding board member of the Bio Valley initiative, a tri-national tissue engineering group, which enabled the setup of a licenced GMP laboratory at the university of Freiburg. International collaborations included board membership of the EU-funded EUROCELL program and the international Cartilage Repair Registry. Recent research has been done on stress loading of cartilage defects and stability of biodegradable scaffolds in collaboration with the Swiss Federal Institute of Technology Zurich/Switzerland. Christoph Erggelet is member of ICRS since the foundation in 1997 and served as a board member. He was President of ICRS for the term office 2013-2015.

Farr Jack, MD
Cartilage Restoration Center of Indiana, Greenwood, US

Jack Farr received his undergraduate degree in biological engineering from Rose Hulman Institute of Technology in 1975, where he also was awarded an honorary doctorate of biological engineering. He earned his medical degree from Indiana University in 1979. He completed his orthopaedic surgery residency at Indiana University Medical Center in 1986. Dr. Farr has a subspecialty practice in knee and cartilage restoration. His numerous appointments and affiliations include a voluntary clinical full professorship in orthopaedic surgery at Indiana University Medical Center, a board position with the Cartilage Research Foundation, the International Cartilage Regeneration & Joint Preservation Society (ICRS) general board (Meetings and Education Committee Chair) and Patellofemoral Foundation vice president. For more information, please go to www.CartilageRestoration.org. As a leader in U.S. cartilage restoration advances, Dr. Farr has written numerous articles, book chapters, and has completed and edited two cartilage books published in 2013. He serves as associate editor for the journals Cartilage and American Journal of Orthopaedics. For a full listing of publications, please visit www.CartilageRestoration.org. He lectures both nationally and internationally and participates in several ongoing articular and meniscal cartilage clinical trials. He also was a design surgeon for a meniscal allograft transplant system and two knee patellofemoral osteotomy systems. For patients with knee changes too far advanced for restoration, Dr. Farr worked as a design surgeon for a current partial knee replacement system (Sigma High Performance Partial Knee Replacement). Dr. Farr is actively affiliated with the Ortholndy Hospital and Community Hospital South. He is a member of the American Academy of Orthopaedic Surgeons, the American Orthopaedic Society of Sports Medicine, Arthroscopy Association of North America, the International Cartilage Regeneration & Joint Preservation Society (ICRS), International Patellofemoral Study Group, International Society of Arthroscopy, Knee Surgery & Orthopaedic Sports Medicine and the European Society of Sports Traumatology, Knee Surgery & Arthroscopy.

Filardo Giuseppe, MD, PhD
Rizzoli Orthopaedic Institute, Bologna, Italy

Orthopaedic surgeon and researcher focusing on clinical and basic research on cartilage treatments at the University of Bologna and Rizzoli Orthopaedic Institute, Bologna, Italy, and at the Ospedale Civico di Lugano, Switzerland. Specialized in Orthopaedics and Traumatology at the Rizzoli Orthopaedic Institute (Bologna, Italy). Research fellow at Rush Cartilage Restoration Center in Chicago (IL), USA. Traveling fellow in SIGASCOT-GOTS fellowship and in Peterson-SANOFI ICRS fellowship. PhD on “cartilage regenerative treatments” at Bologna University. Vice-president of the Cartilage Committee of the Italian Society SIGASCOT. Member of the Cartilage Committee of ESSKA. Deputy Co-Chair of the “Fellowship Committee” of ICRS. Deputy editor of the Joints Journal (official journal of the Italian society SIGASCOT). Member of the Editorial Board of Orthopaedic Journal of Sports Medicine (OJISM) and BioMed Research International Journal. Reviewer for AJSM, JEO, Cartilage, and KSSTA Journals. Participant to several National and International research projects on orthopaedic biotechnologies. Author of more than 250 articles and book chapters; H index: 53.
Gersing Alexandra, MD
Technical University of Munich, Munich, Germany
Alexandra Gersing received her MD from the Technical University of Munich, Germany in 2011 after studying in Hamburg, Boston and Lisbon. She began her training in radiology at the Technical University of Munich, where she currently works as a board-certified radiologist with a special focus on MSK imaging. Dr. Gersing worked as a postdoctoral research fellow at the Department of Radiology and Biomedical Imaging of the University of California, San Francisco from 2014 to 2016. After becoming an Assistant Professor in 2019, she is currently the Vice-Chair of the MSK imaging research group at the Technical University of Munich. Her research is centered on new CT and MR imaging techniques for musculoskeletal imaging with a focus on cartilage imaging, bone imaging as well as bone and soft tissue tumor imaging.

Gobbi Alberto, MD,
Orthopaedic Arthroscopic Surgery International, Milan, Italy
Alberto Gobbi graduated in 1983 and completed his residency program in 1988 in Orthopaedic surgery at Milan University and Sports Medicine in Genova in 1992. Dr. Gobbi himself was an athlete at national level and served on the Italian National Olympic Committee, for the World Motocross Championship, African Rallies, offshore boat racing, downhill ski, volley and basketball. He was nominated “azzurro d’Italia” in 1998. His participation in high-risk sports led him to focus on trauma, surgical technique and advanced rehabilitation, he became a point of reference for many International athletes.

He worked for several years with many major International experts in orthopaedic surgery, arthroscopy and regenerative medicine who are now considered the Giants. He was one of the first Europeans to join the International Cartilage Regeneration & Joint Preservation Society (ICRS). In 1996 he became an International member of the American Academy of Orthopaedic Surgeons (AAOS) and then Honorary Member of the Arthroscopy Association of North America (AANA). Since then he has collaborated with the most important scientific Societies including ISAKOS and ESSKA. Dr Gobbi pioneers research on biological therapies of orthopaedic injuries, establishing an international reputation in the field of regenerative medicine and developing advanced surgical techniques with the use of mesenchymal stem cells and growth factors. He performs highly qualified scientific, surgical and educational activities at International level. He served as a reviewer for many journals, is Associate Editor of “Cartilage” since 2010 and in 2012 he received the award for Best International Publication in an American Journal. In 2011 he was acknowledged as a Visiting Professor at Kobe & Osaka University, Japan, in 2014 he was nominated Visiting Professor in the Department of Orthopaedic Surgery directed by Prof. David Amiel at the University of California San Diego - UCSD. In 2018 he received certificate of appreciation from Yonsei University Korea and he was nominated Honorary professor at the University of Peking and at the N.U.S. National University of Singapore where he also delivered the VK Pillay Lecturer. He founded OASI Bioresearch Foundation Gobbi Onlus (NPO) which is recognized as an International Teaching Center by ISAKOS and ICRS and has dedicated his time to teaching hundreds of fellows during the last 20 years. He has published over 200 scientific papers in international peer-reviewed journals, edited several books and contributed many chapters in scientific publications. He currently serves on the board of directors of ISAKOS and he is the ICRS Past President (2018-2019).

Pia M. Jungmann, MD, MHBA
University of Freiburg, Freiburg, Germany
After her Studies in Münster, Toulouse and London, Pia M. Jungmann worked from 2008 to 2010 as a Resident in Orthopedic Surgery at the University of Freiburg, Germany and established her clinical and scientific Basis in musculoskeletal and cartilage imaging. After her postdoctoral research Fellowship from 2011 to 2012 at the Department of Radiology and Biomedical Imaging at the University of California, San Francisco (UCSF) she completed her training in Radiology at the Technical University of Munich in 2016. She worked as a Clinical Fellow in musculoskeletal Radiology at the Balgrist University Hospital (2016) and in Neuroradiology at the University Hospital (2017-2018) in Zurich before becoming Section Head of Musculoskeletal Radiology at the Department of Diagnostic and Interventional Radiology in Freiburg, Germany in 2019. Her research focuses on musculoskeletal imaging, mainly on cartilage and cartilage repair imaging, Metal Artifact Reducing MR Techniques and other advanced musculoskeletal MR imaging techniques.
INTERNATIONAL FACULTY

Juras Vladimir, PhD
Medical University of Vienna, Vienna, Austria
Dr. Vladimir Juras has a faculty position at Department of Biomedical Imaging and Image-guided Therapy at Medical University of Vienna, Austria. He graduated from Comenius University in Bratislava, Slovakia, obtained PhD degree in Bionics and Biomechanics at Slovak Academy of Sciences in Bratislava, Slovakia and did his PostDoc at Medical University of Vienna. The main research interests are non-invasive quantitative imaging methods for assessment of connective tissues such as cartilage, meniscus, tendon, sub-chondral bone, and ligaments including collagen sensitive methods (T2/T2*) as well as proteoglycan sensitive methods (dGEMRIC, sodium MRI, gagcEST). His special focus is on rapidly relaxing tissues like tendons and ligaments using bi-component T2* analysis. Dr. Juras is also interested in the modern post-processing methods in cartilage research including machine learning (convolutional neural networks, logistic regression), texture analysis (GLCM) and multi-dimensional data analysis. Dr. Juras published and co-authored more than 40 papers mostly in the field of musculoskeletal quantitative MRI, reviewed number of papers for scientific journals (European Radiology, Magnetic Resonance in Medicine, NMR In Biomedicine etc.) and is member of many societies (International Society For Magnetic Resonance in Medicine, International Cartilage Regeneration & Joint Preservation Society (ICRS), Radiological Society of North America).

Kainberger Franz, Ass Prof., PhD
AKH - Medical University of Vienna, Vienna, Austria
Franz Kainberger graduated 1983 at the University of Innsbruck Medical School. From 1985 – 1990 residency at the Department of Diagnostic Radiology University Hospital Vienna/Austria. Since 1994, Associate Professor of Radiology at the Section of Osteology of the Department of Diagnostic Radiology and deputy-chief from 1995-2008. Since then, deputy chief of the Division of Neuroradiology & Musculoskeletal Radiology and Medical Director of the Computer Image Analysis (CIR) Lab. From 2004-2007 and again since 2011 he is member of the Board of Directors of the medical school at the Medical University of Vienna. He published 231 scientific papers in international and national scientific journals and 53 books or book chapters as an author or co-author. He has been involved in various activities of national and European scientific associations and congresses. Among them, he served as President of the Austrian Society of Radiation Protection (2005 – 2011, www.strahlenschutz.org), as President of the College of Physicians of Vienna (2011 – 2015, www.billrothhaus.at), is currently President of the European Society of Musculoskeletal Radiology (www.essr.org) and incoming Chairman of the ESR Radiation Protection Subcommittee. From 2005 to 2011, he was Co-editor of the CME section of the journal “Der Radiologe”, since 2005 Member of the Editorial Board and since 2015 Section-Editor for Imaging of the “Wiener klinische Wochenschrift - The Central European Journal of Medicine”. Main research interests are in the field of musculoskeletal radiology (focussing on rheumatology, sports medicine and orthopaedic oncology), in computer-assisted imaging, and in radiation protection.

Kon Elizaveta, Ass Prof., MD
Humanitas University, Milan, Italy
Associated Professor Humanitas University, Milan, Orthopedic surgeon, Center of Functional and Biological Reconstruction of the knee, Humanitas Research Hospital, Milan, 1st Vice President of the International Cartilage Regeneration & Joint Preservation Society (ICRS). Until 2017 Director of Nano-Biotechnology Laboratory and orthopaedic surgeon, Rizzoli Orthopaedic Institute and Assistant Professor, University of Bologna, Coordinator of numerous research projects and clinical trials regarding biotechnology applications in orthopaedics, into the framework of Italian and European research. Author of over 180 scientific articles in peer-reviewed journals and over 30 chapters in textbooks in orthopaedic surgery (H-index 64). Faculty of more than 400 society meetings all over Europe, Asia and America. Associated Editor of BMC Musculoskeletal Disorders Journal, International Orthopaedics, Journal of Experimental Orthopaedics and Joints. Reviewer for more than 20 Orthopaedics Journal. Travelling Fellow ESSKA/AOSSM European/North American Sports Medicine Traveling Fellowship, 2009 and ICRS Travelling Fellowship, North America, 2004 Winner of several awards as most cited and most downloaded publication 2011-2016 in Arthroscopy Journal, Leading article Knee Surgery Sports Traumatology Arthroscopy Journal, 2013 and 2016, Poster Award Cum Laude, ICRS World Congress, 2015 and 2013, Most cited publication 2009-2010 in American Journal of Sports Medicine, Scientific exhibit award of excellence AAOS Annual Meeting 2011.
**Lattermann Christian, MD,**  
**Brigham and Women’s Hospital, Harvard Medical School, Boston, US**

Christian Lattermann has recently been appointed to the Brigham and Women’s Hospital at Harvard Medical School where he will be the Chief of Sports Medicine and Director of the Cartilage Repair Center. Until 2018 he was Professor and Vice Chair for Orthopaedic Surgery and Research at the University of Kentucky (UK). He is the founder and director of the Center for Cartilage Repair and Restoration at UK. Christian Lattermann began his training at Hannover Medical School in Germany. In 1997 he did a research and clinical fellowship in Sports Medicine at the University of Pittsburgh, USA, where he continued his career as resident in Orthopaedic Surgery. He continued to complete a fellowship in Sports Medicine and Cartilage Repair at Rush University. Christian Lattermann started his independent career in 2006 at the University of Kentucky and has built a strong clinical research program. He is an expert in cartilage repair, outcomes research and clinical trials. His recent appointment to the Brigham and Women’s Hospital allows him to continue his research work in the field of clinical trials in early OA and cartilage repair and will continue the tradition of the Boston Cartilage Repair Center, built by Dr. Tom Minas and Dr. Andreas Gomoll. Christian Lattermann has published over 100 peer-reviewed papers, over 25 book chapters and his research has been funded by national and federal institutions such as the National Institute of Health, Arthritis Foundation of America, NFL charities, Arthroscopy Association of North America (AANA) and the Physical Therapy Association of America (PTAA). Christian Lattermann is active in national organisations in the US, and Germany where he is the current chair of the Research committee of the German-speaking Arthroscopy Society (AGA). He was program co-chair for the World Congress in Macau in 2018 and has been elected by the ICRS membership as Treasurer of the Executive Board of the ICRS.

**Link Thomas, PhD**  
**University of California, San Francisco, UK**

Thomas M. Link is Chief of Musculoskeletal Imaging and Clinical Director of the Musculoskeletal and Quantitative Imaging Research Group in the Department of Radiology and Biomedical Imaging at UCSF. Dr. Link is a recognized international leader in MSK radiology, he has written over 400 peer reviewed articles and several textbooks. His expertise focuses particularly on imaging of osteoporosis, osteoarthritis and cartilage. Dr. Link’s research work is funded by the National Institutes of Health and he is also Program Director of a National Institute of Biomedical Imaging and Bioengineering funded T32 training grant. Dr. Link serves on the Editorial Boards of Radiology, AJR, Osteoarthritis and Cartilage, and European Radiology. He is also Vice-Editor of Skeletal Radiology.

**Marlovits Stefan, MD, MBA**  
**Medical University of Vienna, Vienna, Austria**
Minas Tom, Prof., MD
Paley Orthopedic & Spine Institute, West Palm Beach, US
Tom Minas is the President of the ICRS, 2019-2021. He is an Attending Orthopaedic Surgeon at the Paley Orthopedic and Spine Institute, West Palm Beach, Florida. He remains a Professor Emeritus, of Orthopaedic Surgery at Harvard Medical School, where he was from 1989-2019, and set up the first Cartilage Repair Center in the USA at the Brigham and Women’s Hospital, Boston MA. Tom received his medical degree from the University of Toronto and his Masters in Epidemiology from the Harvard School of Public Health. He completed his fellowship in Pelvic Trauma and Joint Reconstruction at the Sunnybrook Medical Centre in Toronto, Canada and a Total Joint Arthroplasty fellowship at Brigham and Women’s Hospital. He is an internationally recognized leader in joint preservation approaches to treating knee OA. He performs surgery of the knee; arthroscopy, joint preserving osteotomies, partial, total and revision joint replacements. He is also an expert in cartilage repair and autologous chondrocyte implantation (ACI), having brought the technique to the US from Sweden. He is a member of the ICRS since its founding in 1997, having served on the Education Committee and the Executive Board, and also as the Chairman of the Cartilage Research Foundation, US. He is a member of the Knee Society, and in 2013, his team was honoured with the Insall Award for his work on The Long Term Outcomes assessment of ACI in the knee. He is involved in the development of tissue preserving implants and instrumentation for knees targeted at joint resurfacing. His work in patient-specific knee replacement has led to the introduction of a family of tissue preserving, customized implants based on patient-specific imaging data to restore native articulating geometry. (Member of the American Academy of Orthopedic Surgeons, Canadian Orthopedic Association, International Society of Arthroscopy, Knee Surgery and Orthopaedic Sports Medicine, 2007), Honorary Fellow of ICRS (International Cartilage Repair Society, 2007), Honorary Member of Swiss Society of Accident Surgery and Insurance Medicine (2008) and Honorary Member of Swiss Orthopaedic Society (2009).

Mlynarik Vladimir, Dr., PhD
Medical University of Vienna, Vienna, Austria
The current research of Vladimir Mlynarik at the Medical University of Vienna is focused on new quantitative MRI methods for detecting early degeneration of articular cartilage. His initial in vitro studies of relaxation times and magnetization transfer of cartilage-bone specimens were performed at the University of Trieste using MR microimaging. His current topic of research is the optimization of the CEST technique for the quantification of glycosaminoglycans in cartilage and connective tissues on clinical platforms. In the past, he worked on various biomedical applications of magnetic resonance, on improving methods of localized short echo time magnetic resonance spectroscopy. He also studied the creatine kinase reaction in brain of rat and mouse models of different pathologies (University Hospital Bratislava, EPFL Lausanne). He serves as an editor or a reviewer for numerous international scientific journals. He is a member of the International Society for Magnetic Resonance in Medicine and the European Society for Magnetic Resonance in Medicine and Biology.

Nakamura Norimasa, Prof., MD, PhD, FRCS
Osaka Health Science University, Osaka, Japan
Norimasa Nakamura is professor of the Institute for Medical Science in Sports at Osaka Health Science University and the center for the advanced medical engineering and informatics at Osaka University. He is an orthopaedic surgeon at the Osaka University Hospital, Osaka, Japan, specializing in arthroscopic surgery. He received his MD at the Osaka University in 1988 and completed a specialization in orthopaedics in 1992. In 1994, he received a PhD. In 1995, he became Assistant Professor of orthopaedics at the Osaka University and in 2009, moved to the current position. His research has been focused on joint tissue repair with main focus on the regeneration of cartilage, ligament, and meniscus with stem cells. Today the main interest is the development of three-dimensional osteochondral bio-implant using pluripotent stem cells in combination with biomaterials, by the collaboration with the iPS cell research center, the Kyoto University, and the Division of Tissue Engineering, the University of Tokyo. He served as the President of the International Cartilage Regeneration & Joint Preservation Society (ICRS) from 2016-2018.
Nehrer Stefan, Prof., MD, PhD  
**Donau University Krems, Krems, Austria**

Stefan Nehrer is an orthopaedic surgeon at Department for Orthopaedic Surgery at the University Hospital in Krems, Professor for Tissue Engineering at Center for Regenerative Medicine, and since 2011 he is also Dean of Faculty Health and Medicine. Furthermore, he is head of Department Health Sciences, Medicine and Research since March 2013 at Danube University Krems. He studied at the Medical University Vienna where he obtained his MD in 1984 and his PhD in 1999. From 1995 to 1996 he was at the Harvard Medical School in Boston, USA, at Prof. Myron Spector where he started his scientific work in cell-based therapies in cartilage regeneration. From 2000 to 2006 he was head of orthopaedic research at the Medical University Vienna and leading surgeon in sports medicine and paediatric orthopaedic. In 2007 he was appointed Professor for Tissue Engineering at Danube University Krems. Over the years he has continued his research on experimental and clinical applications of chondrocyte transplantation and formed a group for tissue engineering research. Furthermore, his interests focused on mesenchymal cell differentiation and design/implementation of tissue culture bioreactors for automated and controlled manufacturing of cartilage, bone and osteochondral grafts, based on autologous cells and 3D porous scaffolds. He has published 93 peer reviewed articles and numerous other articles and book chapters in national and international journals. Prof. Nehrer has presented at many national and international meetings and he is member of national and international societies. From June 2016 to May 2018 he was the president of the German-Austrian-Swiss Society for Orthopaedic Traumatologic Sports Medicine (GOTS).

Neubauer Markus  
**Center for Regenerative Medicine and Orthopaedics, Krems, Austria**

Markus Neubauer is a resident physician at the Department for Orthopedics (University Hospital Krems, Austria, Head of department: Prim. Univ.-Prof. Dr. Florian Gottsauner) and simultaneously conducting his PhD on “Regenerative Medicine in Cartilage repair” at the Center for Regenerative Medicine at the Danube University Krems (Head of department: Univ.-Prof. Dr. Stefan Nehrer).

Niemeyer Philipp, Prof., MD, PhD, OCM  
**Orthopädische Chirurgie München, Munich, Germany**

Professor Philipp Niemeyer is Consultant Surgeon at the OCM in Munich, Germany (Orthopädische Chirurgie München). After graduating from the University of Freiburg in 2002, he began his clinical training at the Department of Orthopaedics at the University of Heidelberg (Germany, Prof. Dr. V. Ewerbeck), which he continued in the Department of Orthopedics and Traumatology at the University of Freiburg. Since that time, he conducts research into preclinical and clinical aspects of the regeneration of cartilage tissue. In addition to publishing various scientific papers in this area he was awarded in 2005 with the Kurt Stein Award of the University of Freiburg in 2012 and the Research Prize of the German Society for Orthopaedics and Orthopaedic Surgery (DGÖOC). In 2013 he became Associate Professor at the Freiburg University; he is executive board member of the German-Speaking Society for Arthroscopy and Joint Surgery (AGA) and the German Knee Society (DKG). Furthermore, he is initiator of the German Cartilage Registry which has been introduced in 2013. Since 2016, Philipp Niemeyer is Consultant Surgeon at the OCM in Munich, Germany (Orthopädische Chirurgie München).
Raudner Marcus, MD
High Field MR Centre, Vienna, Austria
Marcus Raudner received his MD from the Medical University of Vienna, Austria in 2017. He began his residency in radiology at the Department of Biomedical Imaging and Image-guided Therapy of the Medical University of Vienna, Austria. He started his scientific work as part of the musculoskeletal imaging group under Prof. Siegfried Trattnig, MD at the High Field MR Centre (HFMRC) of the Department of Biomedical Imaging and Image-guided Therapy of the Medical University of Vienna, Austria in 2013. Marcus started an MDPhD curriculum in 2015 and is now a PhD candidate in Medical Physics. He is also acting deputy chief resident, was treasurer of the Young Scientist Association (YSA) of the Medical University of Vienna and enjoys actively teaching and mentoring students. Marcus is a member of ICRS, ISMRM, ESR, RSNA, DRG and ÖRG and reviewer for European Radiology. His main research interests are new developments in quantitative MRI focusing on postoperative assessment of knee cartilage after various repair techniques and on prospective assessment of the intervertebral disc using accelerated sequences for T1, T2 and T2* mapping in clinically feasible acquisition times with a growing interest in automatic segmentation of qMRI data using CNNs.

Redl Heinz, Ass. Prof., PhD
Ludwig Boltzmann Institute for Experimental and Clinical Traumatology, Vienna, Austria
Heinz Redl has a background in biochemistry with almost 40 years’ experience in trauma and regenerative medicine research. He was the director of the Ludwig Boltzmann Institute of Experimental and Clinical Traumatology within the main trauma research center of AUVA (1998-2019) representing 7 trauma and 4 rehabilitation centers and holds the position of Associated Professor at the Technical University Vienna, Institute for Chemical Engineering, plus adjunct Professor at the University of Texas, Medical Branch at Galveston and at the Medical University of Vienna. He coordinates the Austrian Cluster for Tissue Regeneration since 2006, which includes 28 work groups from academia with multiple research targets and 12 spin-off groups. To further enhance industry cooperation, he founded in 1998 the company Trauma Care Consult, which is specialized on preclinical research and assists products registration at FDA and EMA. In 2014 he co-founded the spin-off company Liporegena and in 2017 MorphoMed. Prof. Redl organized many conferences in the field of regenerative medicine such as the World Congress for Tissue Engineering and Regenerative Medicine (TERMIS 2012) and many annual workshops (Winterschool Radstadt and Wiggers Bernhard series). He holds positions in several societies, such as Past-Chair of TERMIS-EU and is member of multiple editorial boards (e.g. Tissue Eng., J.TERM, J. Eur Cells Mat.). He is editor in Chief of the updatable book series Springer/TERMIS “Tissue Engineering and Regeneration”. He was awarded in 2015 “International Fellow of Tissue Engineering & Tissue Regeneration” and in 2018 “International Fellow of the European Alliance for Medical and Biomedical Engineering and Science”.

His expertise includes experience in different fields of tissue regeneration, he is co-developer of the fibrin sealant system (>40 years), developer of surgical devices in current clinical use and many collaboration projects with major industry partners. He has co-authored > 560 papers and holds > 15 patents/patent submissions. He has also participated in several EC projects including e.g. NoE Expertissues, Angioscaff, Biodesign, IMCOSS, UGEN, Arrest Blindness as well as COST Actions.

Roemer Frank, Prof., Dr.
University of Erlangen-Nuremberg, Erlangen, Germany
Frank Roemer is a German board-certified musculoskeletal radiologist with a strong focus on MRI. He is Professor of Radiology at the University of Erlangen, Adjunct Associate Professor at Boston University, Co-Director of the Quantitative Imaging Center at Boston University School of Medicine and Chief of Musculoskeletal Research at the Department of Radiology at the University of Erlangen, Erlangen, Germany.
Shabshin Nogah, Prof., MD, MBA, BSc, Hospital of University of Pennsylvania, Ra’anana, Israel

Nogah Shabshin, is a musculoskeletal radiologist. She is staff and adjunct professor of Radiology at the hospital of the University of Pennsylvania, Philadelphia since 2008, and leading the MSK radiology at the Emek medical center, Afula, Israel. She is a member of the editorial board of Skeletal Radiology since 2008, chair of the promotion committee of the refresher course of the International Skeletal Society since 2014 and a member of the additional committees in the organization. She received the Fellow research award by (2001), cum laude educational exhibits (2009) from the Radiological Society of North America and an honorarium (2005). She is an author and co-author of 49 scientific papers and 3 chapters and well as 92 scientific presentations and more than 33 invited lectures. She graduated (Cum Laude) the Rapaport School of medicine at the Technion, Haifa and received a Kellog-Rcanati MBA degree (2011). She completed her Radiology residency at Soroka University Medical Center, Beer-Sheba, Israel and a Musculoskeletal radiology fellowship at Thomas Jefferson Medical College, Philadelphia, PA. She was an assistant professor of Radiology at Drexel University, Philadelphia, PA. She founded the Musculoskeletal radiology section at Sheba Medical Center. Dr. Shabshin Complet-ed her MBA studies at Kellogg-Recanati business school. She then served as chair of Radiology at Assuta University Medical Center Network and (2011-2014) and as interim chair of Radiology at Carmel Med-ical Center. She currently shares her time between clinical-academic work and medical start-up companies. Areas of interest: Bone marrow edema syndromes, stress fractures, musculoskeletal injuries in pregnancy, osteoid osteoma ablations and deep tissue injuries.

Stotter Christoph
Danube-University Krems, Krems, Austria

Christoph Stotter is a resident at the Department for Orthopedic Surgery and Trauma-ology (Landesklinikum Baden-Mödling, Austria, Head of department: Prim. Univ.-Prof. DDR. Thomas Klestil) and simultaneously conducting his PhD on „Biotribology of articular cartilage” at the Center for Regenerative Medicine at the Danube University Krems (Head of department: Univ.-Prof. Dr. Stefan Nehrer).

Szomolanyi Pavol, Dr., PhD
Medical University of Vienna, Vienna, Austria

Dr. Pavol Szomolanyi has a postdoctoral position at the High Field MR Center – 7 Tesla MR, Department of Biomedical Imaging and Image-guided Therapy at Medical University of Vienna, Austria. He graduated from Slovak Technical University, Bratislava, Slovakia, obtained PhD degree in the Magnetic Resonance Imaging field at the Institute of Measurement Science, Slovak Academy of Sciences, Bratislava, Slovakia). During his post-doctoral period, he worked at foreign institutions (University of Trieste, Italy; University of New Brunswick, Canada), where he devoted himself to MRI measurement of bone structure and bone density as well as non-living samples (concrete, plastics and selected foods). His main scientific interest is on quantitative MRI methods applied to the musculoskeletal field, specifically into the research and quantification of human knee cartilage, ligament and tendons. He participated in research projects as well as clinical studies, where T2, T2* and gagCEST was used for evaluation of cartilage maturation after the cartilage repair procedures or ligamentization process after the ACL reconstruction surgery. Dr. Szomolanyi published and co-authored 77 papers in peer-reviewed journals, mostly in the field of musculoskeletal quantitative MRI, reviewed number of papers for scientific journals (European Radiology, Journal of Magnetic Resonance Imaging, Osteoarthritis and Cartilage etc.) and is member of several societies (International Society for Magnetic Resonance in Medicine, International Cartilage Repair Society).
Trattnig Siegfried, Prof. MD  
Medical University of Vienna, Vienna, Austria  
Siegfried Trattnig graduated from the University of Vienna Medical School in 1985. He trained in Radiology and subsequently served as Assistant Medical Director and Acting Medical Director for the Section of Neuroradiology in the Department of Radiology, Medical University of Vienna. He was appointed as an Associate Professor in Radiology 1993 becoming the Acting Medical Director at the Clinical Magnetic Resonance Institute at the University of Vienna. Since 2003 Prof Trattnig has the position of the Medical Director of the Centre of Excellence in high-field MR at the Medical University of Vienna. In 2010 he was appointed as a full Professor for Radiology with special focus on High field MR. Prof. Trattnig has pioneered the field of multi parametric or biochemical MR imaging of cartilage. He is currently the lead researcher on the clinical 7T & 3T projects at the Medical University in Vienna. Based on the results of clinical comparison studies between 3 and 7T his Center of Excellence for High Field MR was appointed as the international Reference Center for 7 Tesla by Siemens Healthcare, the leading vendor in the ultra-high field MR. He is editorial board member of 8 scientific journals, member of 35 committees and working groups within the ISMRM, ESR, ESMRMB and the ICRS among the Executive Board member of the ESMRMB, member of the ESR Research Committee Board and Chairperson of the ESR European Imaging Biomarker Alliance (EIBALL) and Director of the School of MRI of the ESMRMB. He is an author of 431 articles in peer reviewed scientific journals and contributed to 25 scientific books. Additionally he has held 26 peer reviewed scientific grants with a total of funding money of 13.5 Mio €, received 12 scientific awards and is a reviewer for 34 scientific journals.

Welsch Goetz, MD  
University of Hamburg Eppendorf, Hamburg, Germany  
Goetz H. Welsch is head of the “Athleticum”, the division of orthopaedic sports medicine of the University Hospital of Hamburg-Eppendorf (UKE), Germany. He is furthermore head of the medical team of the “Hamburger SV”, a Bundesliga football club. Dr. Welsch is German board certified orthopaedic and trauma surgeon with the speciality of knee surgery, sports medicine and musculoskeletal imaging. His clinical and scientific focus since about 15 years is sports medicine and regenerative cartilage therapy, including advanced diagnostics as well as rehabilitation concepts. Treating professional athletes, he is specialized in the treatment and the rehabilitation (return to competition) of acute and chronic injuries of the lower extremity, mainly the knee, the ankle and muscle injuries. Dr. Welsch studied and worked at the University of Erlangen, the Medical University of Vienna, the New York University and the Harvard Medical School. He is member in different orthopaedic and radiological societies, published more than 100 peer-reviewed papers, 20 book chapters and received national and international grants and awards.
Active cells help restore active patients

MACI is autologous chondrocyte implantation, simplified. Repair knee cartilage damage using a patient’s own cells in fewer steps than traditional ACI. A significantly greater proportion of patients treated with MACI experienced clinically meaningful improvements in both pain and function at 2 years when compared to microfracture.1

INDICATION
MACI® (autologous cultured chondrocytes on porcine collagen membrane) is an autologous cellularized scaffold product that is indicated for the repair of single or multiple symptomatic, full-thickness cartilage defects of the adult knee, with or without bone involvement.

MACI is intended for autologous use and must only be administered to the patient for whom it was manufactured. The implantation of MACI is to be performed via an arthrotomy to the knee joint under sterile conditions.

The amount of MACI administered is dependent upon the size (surface in cm²) of the cartilage defect. The implantation membrane is trimmed by the treating surgeon to the size and shape of the defect, to ensure the damaged area is completely covered, and implanted cell-side down.

Limitations of Use
Effectiveness of MACI in joints other than the knee has not been established.
Safety and effectiveness of MACI in patients over the age of 55 years have not been established.

IMPORTANT SAFETY INFORMATION
MACI is contraindicated in patients with a known history of hypersensitivity to gentamicin, other aminoglycosides, or products of porcine or bovine origin. MACI is also contraindicated for patients with severe osteoarthritis of the knee, inflammatory arthritis, inflammatory joint disease, or untreated congenital blood coagulation disorders. MACI is also not indicated for use in patients who have undergone prior knee surgery in the past 6 months, excluding surgery to procure a biopsy or a concomitant procedure to prepare the knee for a MACI implant.

MACI is contraindicated in patients who are unable to follow a physician-prescribed post-surgical rehabilitation program.

The safety of MACI in patients with malignancy in the area of cartilage biopsy or implant is unknown. Expansion of present malignant or dysplastic cells during the culturing process or implantation is possible.

Patients undergoing procedures associated with MACI are not routinely tested for transmissible infectious diseases. A cartilage biopsy and MACI implant may carry the risk of transmitting infectious diseases to healthcare providers handling the tissue. Universal precautions should be employed when handling the biopsy samples and the MACI product.

Final sterility test results are not available at the time of shipping. In the case of positive sterility results, health care provider(s) will be contacted.

To create a favorable environment for healing, concomitant pathologies that include meniscal pathology, cruciate ligament instability and joint misalignment, must be addressed prior to or concurrent with the implantation of MACI.

Local treatment guidelines regarding the use of thromboprophylaxis and antibiotic prophylaxis around orthopaedic surgery should be followed. Use in patients with local inflammations or active infections in the bone, joint, and surrounding soft tissue should be temporarily deferred until documented recovery.

The MACI implant is not recommended during pregnancy. For implantations post-pregnancy, the safety of breast feeding to infant has not been determined.

Use of MACI in pediatric patients (younger than 18 years of age) or patients over 65 years of age has not been established.

The most frequently occurring adverse reactions reported for MACI (>5%) were arthralgia, tendinitis, back pain, joint swelling, and joint effusion.

Serious adverse reactions reported for MACI were arthralgia, cartilage injury, meniscus injury, treatment failure, and osteoarthritis.

For more information, please see Brief Summary of Prescribing Information on next page, or visit MACI.com

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- Treats chronic subchondral bone defects, which are primary cause of joint pain1,2
- Proprietary minimally-invasive injection of AccuFill® BSM; undergoes cell-mediated remodeling as the bone heals3
- Peer-reviewed data demonstrate sustained pain reduction, improved function and quality of life4

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- Autologous anti-inflammatory injection for the treatment of knee osteoarthritis5
- Significantly reduces pain associated with knee OA up to 3 years6**
- Significantly improves mobility in the knee joint associated with OA6**
- 70% improvement in knee pain at 3 years following a single injection6**


* Caution: Investigational Device. Limited by U.S. Law to Investigational Use. Data presented based on European prospective randomized trial; safety and effectiveness not yet established in the U.S.

** As measured by WOMAC pain scores reported by patients continuing follow-up through 3 years (n=19) 19 out of the original cohort of 31 patients showed 70% pain improvement nSTRIDE APS KIT

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