ICRS
International Cartilage Regeneration & Joint Preservation Society

APRIL 14 - 16, 2025 | UTRECHT, THE NETHERLANDS

Hands-On **Lab Skills Course**

CELL-BASED THERAPIES & 3D BIOPRINTING

PROGRAMME OVERVIEW

Course Directors
Jos Malda & Roel Custers, University Medical Center Utrecht (UMC)

Local Organising Committee
Roel Custers, Jasmijn Korpershoek, Riccardo Levato, Jos Malda, Paulina Nunez Bernal, Jaqueline Rios, Nienke van Egmond

Course Organising Office
Cartilage Executive Office (CEO) GmbH, Spitalstrasse 190A, CH-8623 Wetzikon, Switzerland | www.cartilage.org

UTRECHT - LOCATIONS

Monday, April 14
8.30 h **Registration**: main entrance UMC Utrecht
Tram stop: UMC Utrecht
https://maps.app.goo.gl/QxVDeXVfsBYiQKgQ8

10.15 h Walk to Hogeschool Utrecht Applied Sciences / Utrecht Science Park Innovatielab
https://maps.app.goo.gl/jDS9bonJS9DfjmTX8

15.00 h Walk to Regenerative Medicine Center Utrecht (RMCU), located in the Hubrecht Institute
https://maps.app.goo.gl/2PYPad6FvKDnVU8S7

17.15 h Transfer to University Hall/Academie Gebouw
Hall of 1636 for the **Welcome Reception**
https://maps.app.goo.gl/Fbzf8tHgZikRH8cJA

Tuesday, April 15
8.30 h start of the program
Regenerative Medicine Center Utrecht (RMCU), located in the Hubrecht Institute
Tram stop: P+R Science Park
https://maps.app.goo.gl/2PYPad6FvKDnVU8S7

19.00 h **Faculty & Course Dinner**
Stadskasteel Oudaen, Oudegracht 99, 3511 AE Utrecht
https://maps.app.goo.gl/xRsuSUjq27GdD8Gd8

Wednesday, April 16
8.30 h Start of the program
Veterinary Faciliity, Collegezaal 'Paard'
Tram stop: Utrecht Heidelberglaan
https://maps.app.goo.gl/neFvqfxEPbLq1qE97

PROGRAMME OVERVIEW

MONDAY, APRIL 14, 2025

*(Meet at the main entrance of **UMC Utrecht,** Heidelberglaan 100, 3584 CX Utrecht)*

08.30-09.00 **Registration & Badge Pick Up**

09.00-10.15 Welcome | *Jos Malda (NL)*
Defining the Field: Joint Preservation from Bedside to Bench and Back | *Roel Custers (NL) & Nienke van Egmond (NL)*
My Journey in Cartilage Regeneration and Joint Preservation | *Daniel Grande (US)*

10.15-10.30 Introduction in Chondrocyte Isolation and Cell Culture | *Gerjo van Osch (NL)*

10.30-11.00 *Break & Walk to Lab Space*
(Hogeschool Utrecht Applied Sciences / Utrecht Science Park Innovatielab, Heidelberglaan 7, 3584 CS Utrecht)

11.00-12.00 **Hands-on/Lab**: Preparing Cartilage Digestion; Chondrocyte and Chondron Isolation | *Jasmijn Korpershoek (NL)*

12.00-13.00 **Hands-on/Lab:** Cell Counting and Seeding | Jasmijn Korpershoek (NL)

13.00-14.00 **Lunch**

14.00-15.00 **Hands-on/Lab:** Seeding Cells in GelMA

15.00-15.30 Walk to RMCU

15.30-16.15 The Secrets of the Cartilage ECM | *Frank Zaucke (DE)*

16.15-17.15 How to Make Clinical Impact with Translational and Fundamental Research (1+1=3) |
Daniel Saris (US) & Lucienne Vonk (SE)

18.00-20.00 **Welcome Reception** at Academiegebouw, Hall of 1636

TUESDAY, APRIL 15, 2025

*(Meet at **Regenerative Medicine Center Utrecht** (RMCU), located in the Hubrecht Institute, Uppsalalaan 8, 3584 CT Utrecht)*

08:30-09.00 Bioprinting Technologies | *Riccardo Levato (NL)*

09.00-09.30 Introduction into Bioprinting of Cartilage | *Jos Malda (NL)*

09.30-11.00 **Hands-on/Lab**: Bioprint Cells | *Paulina Nunez Bernal (NL)*

11.00-11.30 **Break**

11.30-13.00 **Hands-on/Lab**: On-Chip Systems | *Paulina Nunez Bernal (NL)*

13.00-14.00 **Lunch**

14.00-14.30 Cartilage and Bone Scoring | *Jaqueline Lourdes Rios (NL) & Harrie Weinans (NL)*

14.30-15.00 *In vitro* Models of Cartilage | *Keita Ito (NL)*

15.00-16.00 **Workshop**: Cartilage and Bone Scoring (Histological Images) | *Mattie van Rijen (NL) & Jaqueline Lourdes Rios (NL)*

16.00-17.00 **Workshop**: Bone Quantification (Micro CT + CT) and 3D Medical Technology | *Chien Nguyen (NL) & Kelly Warmink (NL)*

19.00-22.00 **Faculty/Course Dinner** at Stadskasteel Oudaen (€ 80, pre-booking required)

WEDNESDAY, APRIL 16, 2025

*(Meet at **Veterinary Facility**, Collegezaal 'Paard', Yalelaan 114, 3584 CM Utrecht)*

08.30-10.45 In Vivo (Large Animal) Models

- Horse as Translational Model | *René van Weeren (NL)*
- Species Differences | *Jos Malda (NL)*
- Gait Lab Demo and Tour of the Equine Facility | *Harold Brommer (NL)*
- Drilling (Osteo)Chondral Plugs / Filling Chondral Defects with Spheroids | *Marlena Ksiezarczyk (NL)*

10.45-11.00 **Break**

11.00-12.00 Panel Discussion | *Roel Custers (NL), Jos Malda (NL), Nienke van Egmond (NL)*

12.00 **Adjourn**

FACULTY

Harold **Brommer** (NL)

Harold Brommer studied veterinary medicine and graduated cum laude in 1998 at Utrecht University. He did a PhD, he is Specialist of Equine Surgery of the Royal Netherlands Veterinary Association (KNMvD) and diplomate of the European College of Veterinary Surgeons (ECVS). He is working as Professor at the Division of Equine Surgery and Orthopaedics of the Department of Clinical Sciences . He is responsible for veterinary education, patient care and judicial veterinary medicine of equine orthopaedics and surgery.

Roel **Custers** (NL)

Roel is an orthopaedic surgeon at the Department of Orthopedic Surgery at the University Medical Center Utrecht, The Netherlands. In 2010, he finished his PhD research (Metal Implants in Treatment of Cartilage Defects), which was awarded by the Dutch Orthopaedic Society with the Mathijsen-award, for the best thesis of the last three years. In 2014, he did a knee fellowship under supervision of prof Daniel Saris. His primary interest is knee surgery. He is working as a knee surgeon at the Mobility Clinic, which is a multidisciplinary clinic, with a special expertise in young patients with complex knee pathology, like large (osteo)chondral defects, severe OA at young age, malalignment and/or multiligament injuries. Besides basic research and animal experiments, he has performed several human trials. His is PI for the strategic theme regenerative medicine at the UMC Utrecht, with a focus on knee joint preserving treatments. He is a member of the ESSKA cartilage committee. He has great experience with treating patients with knee joint distraction and trained numerous surgeons with this technique. He has a long-lasting (>10 years) fruitful research collaboration with the department of rheumatology of the UMC Utrecht.

Daniel A. **Grande** (US)

Daniel Grande is senior investigator and director of orthopaedic research at the Feinstein Institute for Medical research. He is also full professor at the newly accredited Hofstra School of Medicine. He completed his PhD at New York University and his post-doctoral fellowship in biomechanics at the Hospital for Special Surgery. He has worked extensively in the area of regenerative medicine and tissue engineering. His early work developed the first use of cell based therapy for cartilage repair, currently known as autologus chondrocyte transplantation. He has served on committees with the Orthopaedic Research Society as spine topic chair and the basic science committee.

Dr. Grande is significantly involved in mentoring and teaching of orthopaedic residents for his department. He has been a reviewer for a number of journals including: Journal of Orthopaedic Research, Clinical Orthopaedics, Osteoarthritis and Cartilage, American Journal of Sports Medicine, Nature Reviews Rheumatology and Applied Biomaterials. He has been awarded eight patents and helped found two companies in the orthopaedic surgery field of use. He has served as a member of several companies scientific advisory boards. He completed a five year rotation with OREF to assist in grant reviews. He also regularly serves on NIH study sections for RO1, R21, and SBIR/STTR grants specific to musculoskeletal applications. Daniel Grande is currently the president of the ICRS.

Keita **Ito** (NL)

Prof. Dr. Keita Ito is Vice Dean and full professor in the Dept. of Biomedical Engineering at the Eindhoven University of Technology, where he leads the Orthopaedic Biomechanics group. This group combines numerical/experimental and engineering/biological methods to elucidate degenerative processes in bone, cartilage, disc and tendons/ligaments, as well as regenerative strategies thereof. He also is a professor in the Dept. of Orthopaedics at the University Medical Center Utrecht where he works on the mechanobiology of musculoskeletal regenerative medicine. Within the public-private-partnership Regenerative Medicine Crossing Borders, he is the leader of the Osteoarthritis moonshot. He is also the CSO at NC Biomatrix BV.

He received his doctorate in Medical Engineering and Medical Physics from the Massachusetts Institute of Technology and his medical degree from Harvard Medical School. He was a fellow at the Inselspital, Bern and AO Research Institute, Davos where he stayed eventually becoming Vice Director. He has co-authored over 180 peer-reviewed publications and is on the editorial board of Biomech Model Mechanobiol and is a deputy-editor of the Global Spine Journal. He and his group have been awarded the Spine Young Investigator Award 2004, the ESB Perren Award 2010, GSJ Best Paper Award 2014, as well as other conference awards. He has served in various capacities on the boards of the European Society of Biomechanics, AO Foundation, World Council of Biomechanics, and ISSLS.

Jasmijn **Korpershoek** (NL)

Jasmijn Korpershoek works at the University Medical Center (UMC) in Utrecht, the Netherlands, and the Mayo Clinic in Rochester, USA. She completed her MD in 2017 and her Ph.D. in 2022 at Utrecht University. Her curiosity and dedication to improving patient care through translational research have motivated her to pursue a career in academic research. Her research aims to improve and understand joint preservation and to create translatable treatment options. Jasmijn carried out studies in the full range from basic science (in vitro) research to animal studies, clinical trials, and evaluation of established treatments. In 2021, she won the Prof. Dr. Ir. Rik Huiskes award (best basic science abstract) of the Dutch Orthopedic Society for her work on mitochondrial transfer between MSCs and chondrocytes as an underlying mechanism for MSC-induced chondroinduction. In 2022, Jasmijn was one of the ICRS/ ON foundation traveling fellows and connected with different cartilage experts in Europe.

Marlena Maria **Księżarczyk** (NL)

I am a veterinarian passionate about the anatomy and orthopedics of domestic animals. I gained hands-on experience through five international clinical internships in Norway, Italy, and Romania, spending nearly half my studies abroad. Currently, I am a third-year PhD Candidate, focusing my research on the differences in the morphology of the osteochondral unit among various animal species and investigating the mechanisms of articular cartilage integration in an ex vivo model. In addition, during my PhD, I completed an MBA program in healthcare management.

FACULTY

Riccardo **Levato** (NL)

Dr. Riccardo Levato is Assistant Professor in Biofabrication and Regenerative Medicine at the Department of Orthopedics, University Medical Center Utrecht (UMCU) and Department of Clinical Science of Utrecht University. His main research focus are on the development of Biofabrication strategies to create bioprinted and lab-made tissue models, particularly for on osteochondral regeneration. At UMCU, he focuses especially on novel treatments for cartilage and osteochondral defects and their application in translational regenerative medicine. For his work on biofabrication, he was conferred the 2015 Julia Polak award by the European Society for Biomaterials and the 2016 Wake Forest Institute for Regenerative Medicine Young Investigator Award. Dr. Levato worked in several research groups across Europe: 3Bs, University of Minho, (Portugal); BioMatLab, Technical University of Milan (Italy), Institute for Bioengineering of Catalonia (IBEC, Spain), in the field of Biomaterials and Regenerative Medicine, and holds a cum laude PhD in Biomedical Engineering (obtained at the Technical University of Catalonia, Spain).

Jos **Malda** (NL)

Jos Malda is Professor of Biofabrication in Translation Regenerative Medicine and Head of Research at the Department of Orthopaedics, University Medical Center Utrecht. He also has an appointment at the Department of Equine Sciences, University of Utrecht. He is also the current 2nd Vice President of the ICRS. He received his MSc degree in Bioprocess Engineering from Wageningen University in 1999 and completed my PhD on Cartilage Tissue Engineering in 2003 (University of Twente). In 2007, Dr Malda was awarded a fellowship that allowed him to establish his research group in Utrecht, which focuses on biofabrication and biomaterials design, in particular for the regeneration of (osteo)chondral defects. He has published over 200 articles in peer-reviewed international journals and attracted over 20 million Euro in research funding. He has been a long-standing Board member of the International Cartilage Regeneration & Joint Preservation Society (ICRS) and currently is the Secretary General. Further, he is past President of the International Society for Biofabrication (ISBF).

H. Chien **Nguyen** (NL)

In November 2019, I completed my studies in Technical Medicine at the University of Twente, with a graduation project in Orthopedics at the University Medical Center Utrecht. I then continued at the Department of Orthopedics with a PhD program, focusing on stance abnormalities and knee osteoarthritis. Stance deviations in the leg cause unfavorable distribution of forces in the knee joint, causing parts to be (over)loaded. This can cause wear of the cartilage or worsen the existing wear in the cartilage, which in turn leads to osteoarthritis. Knee osteoarthritis with stance deviation can possibly be treated with surgical stance correction. In addition to my PhD research, I am frequently involved in the clinical implementation of imaging and 3D techniques. The intensive collaboration with the 3D Lab in this has led to my appointment at the 3D Lab. I hope to use my knowledge of 3D technique and imaging to help complex patients in the best possible way.

Paulina **Nuñez Bernal** (NL)

Paulina is originally from Mexico and has a master in regenerative medicine and technology (Utrecht University). She obtained her PhD in Regenerative Medicine under the supervision of Dr. Riccardo Levato, developing volumetric 3D printing for biomedical applications. She has experience with various 3D printing technologies, bio-ink development and 3D cell culture. Her research is primarily focused on the design of novel biofabrication approaches for the development of advanced in vitro models. Alongside her research work, she is coordinator for the Master of Science course in Biofabrication at Utrecht University.

Jaqueline Lourdes **Rios** (NL)

Jaqueline Lourdes Rios is an Assistant Professor at the University Medical Center Utrecht, Department of Orthopaedics. Her research focuses on osteoarthritis, exploring its onset, mechanisms, and treatments, particularly in controlled drug release, patient stratification, and animal-free models. She collaborates with academic and industry partners on innovative therapies.
Dr. Rios also studies implant infections, developing targeted delivery systems using aptamers and antibodies for precise diagnostics and treatment. She earned her PhD in Kinesiology from the University of Calgary, researching exercise and diet in metabolic knee osteoarthritis.
She has secured major research grants, including NWO and National Growth Fund funding. Actively involved in teaching and mentoring, she bridges fundamental research and clinical applications to improve patient care.

Daniël **Saris** (US)

Daniël Saris (Past President of ICRS) is a specialized knee surgeon. He joined the Orthopedics staff of Mayo Clinic in Rochester MN USA where he helps shape the Regenerative Medicine program and sports knee surgery and adult knee reconstruction.

Daniel Saris graduated from University of Amsterdam Medical School. During orthopedic residency Dr. Saris did a fellowship at the Mayo Clinic in Rochester MN USA and subsequently completed a PhD at the University of Utrecht in the Netherlands that introduced the now generally accepted concept of joint homeostasis.

He practiced as staff member in the department of Orthopaedics at the UMC Utrecht for 17 years where he started The Mobility Clinic, an academical expert clinic for Musculoskeletal care and was director of the orthopedic residency program.

He now has his clinical practice at Mayo Clinic Rochester and holds academical appointments as professor of Reconstructive Medicine at the University of Utrecht, as Clinical professor at the University of Twente and as Professor of Regenerative Medicine and professor of Orthopedics at Mayo Medical school.

FACULTY

Nienke **Van Egmond** (NL)

Nienke is an orthopaedic surgeon at the Department of Orthopedic Surgery at the University Medical Center (UMC) Utrecht, The Netherlands. In 2018, she finished her PhD research (Joint Preservation of Unicompartmental Knee Osteoarthritis). In 2018 and 2019, she did a knee fellowship under supervision of Prof Daniel Saris and Roel Custers at the UMC Utrecht. Her primary interest is knee surgery, especially joint preservation treatments (cartilage repair, osteotomies and knee joint distraction), but also knee (revision) arthroplasty. She is working as a knee surgeon at the Mobility Clinic, which is a multidisciplinary clinic, with a special expertise in young patients with complex knee pathology. She is collaborating in several research trials (basic and clinical research), with a main focus on knee joint preserving treatments and regenerative medicine. The Department of Orthopedic Surgery at the UMC Utrecht has a long-lasting fruitful research collaboration with the Department of Rheumatology of the UMC Utrecht.

Gerjo **Van Osch** (NL)

Gerjo van Osch studied Medical Biology at Utrecht University, the Netherlands and received a PhD from Nijmegen University based on her research on mouse models for osteoarthritis (1994). During her postdoc she became interested in cartilage repair and she continued researching this since. Gerjo is currently appointed as full professor of Connective Tissue Regeneration in the Departments of Orthopaedics and Otorhinolaryngology at Erasmus MC, University Medical Center Rotterdam. She also holds a honorary chair in Integrative Cartilage Regeneration at Delft University of Technology.
Gerjo is leading a research group of approx. 15 people. Currently the research focuses on cellular mechanisms of chondrogenesis, the use of stem cells and biomaterials to achieve cartilage repair, and the influence of the inflamed environment in cartilage repair. She is co-author on over 200 publications.
Gerjo is involved in several national and European funded projects (also coordinating a Horizon2020 MSCA-ITN) and is the chair of TERMIS-EU. She has served on the board of several (inter)national research societies such as the Dutch Society for Matrix Biology and the International Cartilage Repair Society and in editorial boards of scientific journals (a.o. Cartilage, Tissue Engineering, Journal of Tissue Engineering and Regenerative Medicine).

Mattie **Van Rijen** (NL)

René **Van Weeren** (NL)

Paul René van Weeren (1957) graduated from Utrecht University's Veterinary Faculty in 1983 and joined the Department of General and Large Animal Surgery. He earned his PhD in 1989 and was a visiting professor in Costa Rica from 1991-1993. A diplomate of the European College of Veterinary Surgeons since 1994, he became a full professor in Equine Musculoskeletal Biology in 2007 and Head of Equine Sciences at Utrecht University in 2012.

His research focuses on cartilage, tendons, and biomechanics. He has supervised 31 PhD graduates and currently mentors 10 PhD students. An editor for several veterinary journals, he has authored over 275 peer-reviewed publications and co-edited Joint Disease in the Horse (2015).

Lucienne **Vonk** (SE)

Lucienne Vonk, PhD, is Chief Scientific Officer at Xintela AB (Sweden) and Senior Researcher at the Department of Orthopaedics, University Medical Center Utrecht (Netherlands). She earned her PhD in 2010 on cartilage tissue engineering and later joined UMC Utrecht. From 2019–2022, she led the scientific department at CO.DON AG (Germany).

Her research focuses on musculoskeletal tissue regeneration, cell-based therapies, and intercellular communication. She has contributed to translational and clinical research, including phases I–III and PIP studies. She has published extensively, secured over €3 million in research funding, and received multiple awards, including the ICRS Young Investigator Award (2016).

Dr. Vonk is Senior & Social Media Associate Editor of the Journal of Cartilage & Joint Preservation and deputy co-chair of the ICRS Translational Research committee, was program co-chair for the ICRS World Congress in Vancouver (2019) and has been active in several other ICRS committees.

Kelly **Warmink** (NL)

I am a postdoctoral researcher at the University Medical Center Utrecht with a background in biomedical sciences. I completed my PhD on osteoarthritis, focusing on the interplay between joint degeneration, metabolism, and inflammation. My current research focusses on bone biology in osteoarthritis and rare bone disorders like Osteogenesis Imperfecta. I use imaging techniques such as (micro)CT to better understand skeletal abnormalities in these diseases and their respective animal models.

Harry **Weinans** (NL)

Our stiff bones are held together by ligaments and tendons and carry the weight and transfer the large forces that are required for locomotion. Without these load bearing mechanical tissues we would look like a gelatin pudding. With aging or after trauma the delicate internal architecture of these connective tissues gets lost, which can result in e.g. cartilage damage and subsequent deterioration (osteoarthritis), loss of bone mass (osteoporosis) problematic healing of fractures or tendons. Bone and cartilage are load bearing structures and degeneration and regeneration in these tissues are continuously influenced by and adapted to the biomechanical demands. The major goal of my research is to investigate the degenerative processes in the skeletal structures and find methods to counterbalance this degeneration or even induce appropriate regeneration after the tissue is already diminished.

FACULTY

Frank **Zaucke** (DE)

Frank is Professor and head of the Dr. Rolf M. Schwiete Research Unit for Osteoarthritis at the Orthopaedic University Hospital in Frankfurt, Germany. Specific interests in his lab include mechanisms of skeletal development, control of cell functions in degenerative diseases and the role of the extracellular matrix (ECM). Frank studied Biology and completed his dissertation at the University of Karlsruhe, Germany. After receiving his PhD, he moved to the University of Cologne where he was working in the Center for Biochemistry. As an independent group leader he developed his own research profile focusing on pathomechanisms of chondrodysplasias and the biochemistry of the cartilage ECM. In 2010, he obtained the Venia legendi in Biochemistry and Molecular Biology from the University of Cologne. In 2016, he moved to Frankfurt and became head of a research unit dedicated to different aspects of osteoarthritis. Frank is member of the Faculty of 1000, the editorial board of the journals Cellular Signalling, American Journal of Physiology and Scientific Reports. He is member of several scientific societies and vice-president of the German Society for Matrix Biology. In 2023, he will chair the prestigious Gordon Conference on Cartilage Biology and Pathology. His research is funded by the German Research Foundation, the EU and the Dr. Rolf M. Schwiete Foundation.

ACKNOWLEDGMENT

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