

## Berton Rahn Research Award



Prof Dr med Dr med dent Berton Albert Anton Rahn  
(1939-2008)

# Background

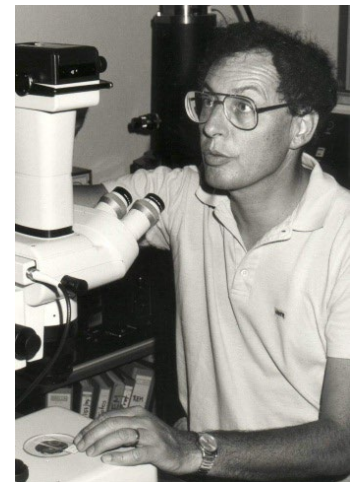
The 'Berton Rahn Research Award' was established in recognition of Berton Rahn's immense contribution to the AO Foundation. The prize previously honored the best completed AO Start-up grant project of that year (based upon final reports and the publications resulting from all completed studies). Since 2017, the award is now open to any AO funded research. From August 2018, there is no longer an age limit for the award. The award consists of a keynote presentation at ARI's eCM conference (along with free registration, accommodation and travel to Davos) and a certificate.

## Berton A Rahn

Here we inform you briefly about the Berton Rahn and his dedication to the Laboratory for Experimental Surgery Davos (LECD) and its continuation as AO Research Institute Davos (ARI), the AOCMF community and to the AO Foundation itself.



On March 26, 2008, Prof Dr med Dr med dent Berton Rahn passed away after a difficult illness. We as the AO Foundation family lost a friend, mentor and collaborator who dedicated himself to research for the Foundation in Davos. Berton was a highly respected scientist whose morphological-based bone histology is world-renowned and frequently used in AO



courses, though often unperceived by those who use and benefit from it. At the 2009 Trustees Meeting in Chicago, the former AO Research Fund Prize Award, which annually honors the best external start-up research fund project, was renamed the Berton Rahn Research Fund Prize Award in honor of his many contributions to the AO Foundation.

Berton grew up in Schaffhausen, Switzerland and first studied dentistry in Zürich until 1964 and medicine in Berlin until 1968. In 1968 he then joined the Laboratory for Experimental Surgery (now ARI) in Davos under the Directorship of Prof Stephan Perren. Berton stayed with AO for over 37 years. Berton received his doctorate in dentistry in 1970, followed by one in medicine in 1973. He qualified as an assistant professor and in 1985 became an associate professor at the University of Freiburg in Germany. In addition to his lecturing responsibilities at the university, he gave lectures on bone healing mainly based on his own research work, at the AO Courses in Davos and worldwide. He also contributed chapters on bone biology and fracture healing to several respected books. His animal studies in sheep on healing of mandibular fractures (1970–1972) were extremely important because they showed that the healing pattern in craniofacial bones (membraneous bones) is the same as in postcranial bones.

Berton was extremely interested in the microscopic pathology (histology) of bone healing and developed polychrome sequence labeling for newly formed bone (1969), used today worldwide in bone research. This technique also led to a decrease in the number of animals needed for research models. Berton also had strong interest in all forms of microscopy and interactions of cells within tissues and with cells and tissues to implants. Berton made important contributions to the development of craniomaxillofacial surgery as well as to the important field of dental implantology. The correction of deformed and damaged maxillofacial structures using Ilizarov's distraction method took some fundamental steps forward thanks to the clinical application of Berton Rahn's research. Berton was an active member of many societies and helped place AO Research on the world map. He was one of the original council members of the European Society for Biomaterials (ESB), helped organize their meeting in Davos in 1984 and 1993 and was chosen

as an honorary member in 2003. Berton was an author of more than 150 papers and has had several dozens of students pass through his hands, many of them earning their doctoral degree with his help. He always listened to his student's problems and liked to help them to solve these issues through their own reasoning. His research was characterized by its creativity, and above all by the support he offered to young researchers (including Geoff Richards in the early 90's).

Berton was vice-director of the ARI (from 1975 onwards) and was intimately involved in the design and building of the AO Center on Clavadelerstrasse in Davos which opened in 1992.

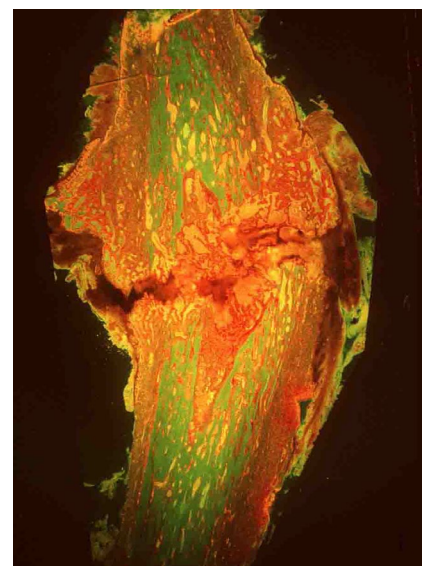
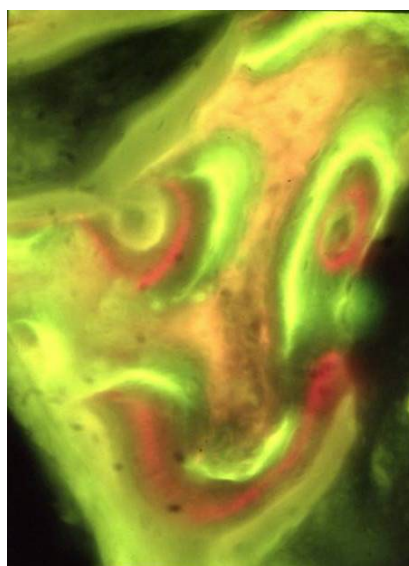
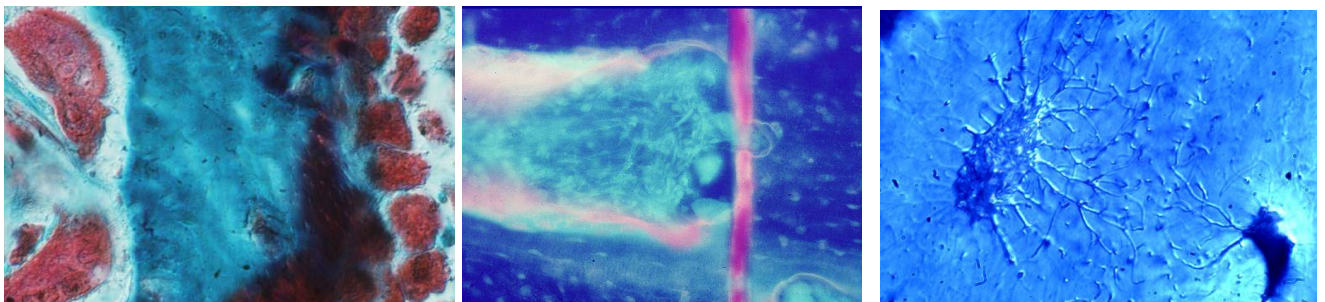
Berton was a reserved, sensitive man, but one who in the right moment could surprise with his unique dry sense of humor. His profound humanity made being in his company a great pleasure. In his short duration of retirement, he served as a Scientific Advisor to ARI until the symptoms of his illness manifested themselves in his bones, the very part of the body that he had spent a lifetime studying.

Berton's influence throughout the formative years of the AO Research Institute Davos, and the AO Foundation as a whole, is remembered with deep gratitude.

Prof R Geoff Richards, Director AO Research & Development

Prof Dr med Stephan M Perren, Honorary & Founding Member AO Foundation, past Director LECD & ARI

Prof Dr med Joachim Prein, Honorary Trustee, AO Foundation



# Berton Rahn Research Award

## Winner 2026:

### Biographical Sketch

#### Dr. Dino Samartzis



Dr. Dino Samartzis was born in Chicago, IL, USA to Steve and Joanna from Filiatra, Greece. Dino went on to simultaneously complete his secondary school studies at Loyola Academy (Wilmette, IL) and at St. Demetrius Solon Greek School (Chicago, IL). He obtained his undergraduate degree from Northwestern University (Evanston/Chicago, USA). He further pursued graduate studies in biological sciences, evidence-based health care, clinical epidemiology, public health, medical sciences, and international relation studies at Harvard University (Boston), University of Oxford (Oxford, UK), University of Cambridge (Cambridge, UK), Erasmus University (Rotterdam, The Netherlands), and Charles University (Prague, Czech Republic). He completed a postdoctoral fellowship at the Department of Biochemistry and at the Department of Orthopaedics and Traumatology at The University of Hong Kong. He went on to serve as an Associate Professor at its Department of Orthopaedics and Traumatology before his departure/return to

Chicago to Rush University Medical Center. He went on to become the Gilbert Beebe Fellow of the Radiation and Nuclear Board of the National Academies of Science (NAS) in Washington D.C. and the United States Department of Energy, the Radiation Epidemiology Branch of the National Institutes of Health (NIH) in Bethesda, Maryland, and at the Radiation Effects Research Foundation (a.k.a. Atomic Bomb Casualty Commission) in Hiroshima, Japan addressing the longitudinal effects of the atomic-bomb and their health-related risks upon the musculoskeletal system. Dino also completed a United States Public Voices Fellowship and was recognized as a Fellow of the Royal Society of Public Health in the United Kingdom.

Dino has spearheaded numerous projects worldwide and has published over 450 peer-reviewed studies in some of the world's most prestigious medical journals (e.g. The Lancet, Lancet Rheumatology, Cell, Nature journals, Arthritis & Rheumatism, Journal of Bone & Joint Surgery, etc.), book chapters, and web-based articles; has produced approximately 30 surgical spine videos; been involved in over 500 presentations at international conferences and institutes; been a Visiting Professor at various institutes throughout the world; has collaborated with over 1000 clinicians/scientists on published research studies, produced and has been the focus of several medical documentaries; and his work has been highlighted in the Encyclopedia Britannica and focused on the covers of various medical journals. He is one of the most cited individuals worldwide in the spine field, among the top experts in spine degeneration and low back pain and noted as one of the Top 2% of Scientists Worldwide according to Stanford University's annual rankings. Furthermore, Dino has been recognized with over 80 team and personal international awards and honors from the spine/musculoskeletal community, including being the "four-time" recipient of the prestigious ISSLS Prize for Clinical Research as well as for Bioengineering, the recipient of Arthritis UK's Research Study Highlight of the Year Award for 2025, the honoree of the United Hellenic Voters of America's Most Distinguished Greek American in Medicine in 2025, and the upcoming recipient of the 2026 Berton Rahn Award by the AO Foundation/AO Research Institute. His work has been featured by over 250 media outlets worldwide, and he has received competitive funding from three continents and multiple grant awards. He has been the Editor-in-Chief of over 30 textbooks and journal theme issues.

Dino has chaired/organized/hosted several spine conferences/meetings/symposia/workshops worldwide (e.g. Canada, China, Belgium, Finland, France, Greece, Italy, Hong Kong, Singapore, USA, etc.) with over 8,000 individuals having attended. He has worked with industry, held leadership positions in numerous sectors of the health-care/research field, collaborated with the World Health Organization (WHO) and the United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR), and has mentored/supervised numerous international students, fellows and the like that have gone to become clinician-scientists and leaders of their respective Departments/Institutes. In fact, as a key proponent of mentorship and supporting young investigators, Dino has helped establish a mentorship program that has, to date, benefited over 400 students, etc., and educational platforms that have seen the involvement of clinicians/scientists representing over 40 countries. Over 3,000 clinician-scientists worldwide have been students in the clinical research educational programs he had a direct role in developing.

Noted as a global research leader, Dino has held leadership positions in many institutes and organizations worldwide. Most prominently he is the Emeritus Chair of the International Research Commission and the International Board Member of AO Spine as well a Trustee of the AO (Davos, Switzerland); Chair of the Spine Section Board of the Orthopaedic Research Society (ORS) of the USA; and Secretary-Elect of the International Society for the Study of the Lumbar Spine (ISSLS).

Dino Samartzis has spearheaded numerous global consortia bridging basic science and clinical research, leading some of the largest and most influential spine studies worldwide. His landmark work on Japanese atomic-bomb survivors established the world's longest musculoskeletal follow-up and informed international radiation safety policies. His Lancet report introducing magnetically controlled growing rods transformed the care of children with early-onset scoliosis, led to FDA approval and worldwide use. Dino's initiatives of novel therapeutics for disc herniations, and genetic and biomarker discovery of spine degeneration have advanced our understanding of spinal disorders and precision care. Recently, Dino was part of a global consortium of "2 million human subjects" (largest musculoskeletal initiative of its kind) that "discovered" over 500 genes related to osteoarthritis of multiple joints throughout the body. These findings possess direct therapeutic potential with drug repurpose, are direction setting for academia/industry, and for the first time have potential to provide direct hope for the 600 million people worldwide suffering from osteoarthritis. Furthermore, Dino is an early pioneer of Spino metabolomics, gut-microbiome science, and integrative poly-omics in spine research. He has reshaped foundational thinking and helped establish imaging-based spine classifications. His ongoing population-based studies continue to map the degenerative cascade across the lifespan, while his innovative work applying precision medicine and pandemic-era public-health insights has shaped international discourse. Among his newest ventures, Dino is leading the paleo-phenotyping of the largest collection of Egyptian mummies in the world with the Field Museum of Chicago — earning him the moniker, the "Indiana Jones of Medicine."

Dino is currently a tenured Professor at the Department of Orthopaedic Surgery at Rush University Medical Center, which serves as the team physicians of the Chicago Bulls, Chicago White Sox, Joffrey Ballet and other sports entities. He is the Founder and Director of the International Spine Research and Innovation Institute (ISRII) as well as the Rush International Spine Education (RISE) platforms at Rush. From January of 2026 and onward, Dino will be the Co-Editor-in-Chief of the European Spine Journal, one of the oldest, most cited and downloaded spine publications in the world.

Among Dino's many accomplishments, what he is most proud of by far is his "family." He married his wife, Imelda (a prominent realtor), in his parents' hometown of Filiatra, Greece. Together, they have two beautiful young daughters, Yianna and Isabella Efstathia, who are their epicenter.

### Summary of Research Interests:

- Degenerative spinal disorders and low back pain
- Precision, multi-omics and integrative spine research
- Musculoskeletal epidemiology, exposome profiling and population health
- Imaging science, deep phenotyping, and classification of spinal disorders
- Global translational musculoskeletal research

# Previous Berton Rahn Research Award Winners

2025



## **A3/4 fracture study and focus issue**

Dr. Marcel Dvorak was a full-time Professor of Orthopaedics at the University of British Columbia and held the Cordula & Günter Paetzold Chair of Clinical Spinal Cord Injury Research.

Award received by Charlotte Dandurand in memory of the late Dr. Dvorak.

2024



## **Passive immunization MRSA AO Registry of bone infection, including biobank Diagnosis of infection using newly synthesized antibodies**

Dr. Edward Schwarz is the Burton Professor of Orthopaedics and Director of the Center for Musculoskeletal Research at the University of Rochester Medical Center, in Rochester, NY, USA.

2023



## **Ria Versus BMC as orthobiologic augments to allografts**

**Brett Crist** Vice Chair of Business Development, Director of the Orthopaedic Trauma Service, Director of the Orthopaedic Trauma Fellowship, Director of the Limb Preservation Center, and is a tenured Professor of the Department of Orthopaedic Surgery at the University of Missouri Health, USA

2022



**CRP Annulus Fibrosus Rupture (AFR) (ANNUMECH)**  
Establish the functional requirements for next-generation annulus repair methods through iterative, parametric experimental and simulation studies, to develop methods for the fabrication of novel biomaterial-based repair devices, and to validate their mechanical and biological performance in organ models

**Stephen Ferguson**, Institute for Biomechanics, ETH Zurich, Switzerland

2021



**3D printed constructs for osteochondral defect repair**

**Jos Malda**, Department of Orthopaedics, University Medical Center Utrecht and the Department of Clinical Sciences, Faculty of Veterinary Medicine, University of Utrecht, The Netherlands

2020



**Rapid Prototyping of Custom-Made Bone-Forming Tissue Engineering Constructs & Projects on 3D printing in collaboration with ARI consortia**

**Ling Qin**, Musculoskeletal Research Laboratory, Department of Orthopaedics & Traumatology, The Chinese University of Hong Kong, China

2019



**Projects on Fracture Related Infection in collaboration with AO Trauma Clinical Priority Program Bone Infection, ARI and AOTK**

**Willem-Jan Metsemakers**, UZ Leuven, Department of Trauma Surgery, Leuven, The Netherlands

2018



**CRP Annulus Fibrosus Rupture (AFR): (ANNUPHEN)**

Characterization of intervertebral disc cells and identification on a suitable cell source for efficient tissue regeneration

**Daisuke Sakai**, Tokai University School of Medicine in Kanagawa, Japan

2017



**CRP Acute Cartilage Injury (ACI): (HiCartia)**

A novel platform for optimizing material design for cartilage tissue engineering and enabling drug discovery for cartilage restoration

**Robert Mauck**, University of Pennsylvania (USA)

2016



**Project S-12-27S:**

Targeting endothelial to mesenchymal transition in fibrodysplasia ossificans progressive

**Gonzalo Sánchez Duffhues**, Leiden University Medical Center (NL)

2015



**Project S-10-07L:**

Controlling nanopography-ECM environment for enhanced bone formation with hMSCs

**Jung Yul Lim**, University of Nebraska-Lincoln (USA)

2014



**Project S-10-62Y:**

Stem cell mobilization for enhanced bone healing

**Clare Yellowley**, University of California Davis (USA)

2013



**Project S-07-1C:**

Can low intensity pulsed ultrasound accelerate osteoporotic fracture healing?

**Wing-Hoi Cheung**, The Chinese University of Hong Kong (China)

2012



**Project S-05-95J:**

In-situ crosslinkable osteoinductive poly(lactide) scaffold for bone regeneration

**Esmail Jabbari**, University of South Carolina (USA)

2011



**Project F-07-43L:**

A pilot study of interleukin-12 local delivery for infection prevention after a traumatic open fracture

**Bingyun Li**, West Virginia University (USA)

2010



**Project 04-J44:**

Skeletal effects of estrogen

**Teppo Järvinen**, University of Tampere (Finland)

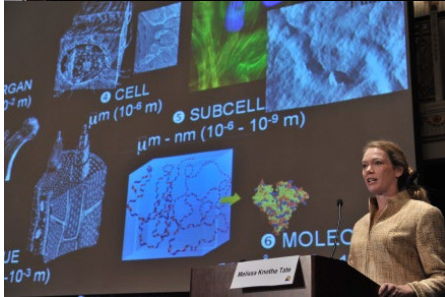
## 2009 (2 winners)



### **Project 04-I58:**

Effects of cyclic compression on intervertebral disc cell metabolism

**James C Iatridis**, University of Vermont (USA)



### **Project 04-K3:**

Unravelling endogenous mechanisms of bone regeneration through quantification of the interplay between bone cells and their environment

**Melissa Knothe Tate**, Cleveland Clinic Foundation (USA)