



2nd International Radiation Oncology Online-Seminar

Novel Unconventional Radiotherapy Techniques: Current Status and Future Perspectives



October 06, 2022 • 02.00 - 08.15 p.m. CET
Online-Seminar via MS Teams

Please register online via www.medastron.at,
the participation link will be sent separately.

DFP
credits
granted



Outline:

We all have witnessed remarkable technological, physical and biological developments in the field of radiation oncology resulting in improved treatment effectiveness and reduced complication rates thanks to the high-precision in tumor identification, localization and dose delivery. However, these improvements in local control and survival do not apply to all clinical situations. A significant percentage of oncologic patients still remains hopeless, like those affected by very large, unresectable bulky tumors that are unsuitable for the conventional radio-chemotherapy. These patients are predestined to palliative or best supportive care. From that the need to improve treatment outcomes for this patient population arises.

In order to **present and to discuss the currently available data in regard to novel, unconventional radiotherapy techniques**, MedAustron is organizing an online seminar that will focus on emerging spatially fractionated radiotherapy approaches with potential to increase the radiation therapeutic ratio. The goal is to bring together leaders in the field to give talks that are experience-focused to foster learning, understanding, inspiration and wonder, provoking conversations that matter.



Organizing Committee MedAustron:

Dr. Slavisa Tubin, CHAIR
Director of Clinical Radiobiology,
Co-Scientific Director,
MedAustron Ion Therapy Center

Prof. Dr. Eugen B. Hug
Medical Director,
MedAustron Ion Therapy Center

Dr. Piero Fossati
Scientific Director Clinical Carbon
Ion Program,
MedAustron Ion Therapy Center

Scientific Program

*All times are Central European Summer Time (CEST)
Each 20-minute talk is followed by a 5-minute Q&A session*

02.00 Welcome Address

Dr. Slavisa Tubin, Chair of the Organizing Committee • Prof. Dr. Eugen B. Hug, PTCOG Past President
Prof. Dr. Ben J. Slotman, ESTRO President

02.15 - Session 1

04.20 Spatially fractionated radiotherapy: GRID, LATTICE, PATHY, MINIBEAM, MICROBEAM - past, present & future

- 02.15 - 02.35 • **GRID Radiotherapy**
Majid M. Mohiuddin, Radiation Oncology Consultants and Northwestern Proton Center, Warrenville, Illinois, USA
- 02.40 - 03.00 • **LATTICE Radiotherapy**
Xiaodong Wu, Innovative Cancer Institute based in Miami, Florida, USA
- 03.05 - 03.25 • **SBRT-PATHY, Particle-PATHY**
Slavisa Tubin, MedAustron Center for Particle Therapy and Research, Wr. Neustadt, Austria
- 03.30 - 03.50 • **Minibeam and Microbeam radiotherapy**
Yolanda Prezado, Centre National de la Recherche Scientifique (CNRS), Universités Paris, France
- 03.55 - 04.15 • **Distal non-targeted radiation effects**
Pedro Lara, Department of Oncology San Roque University Hospital, Las Palmas, Spain

04.20 Break

04.40 - Session 2

08.15 FLASH, low doses, single doses, particles

- 04.40 - 05.00 • **Importance of radiation dose and fraction: single doses**
Carlo Greco, Radiation Oncology, Champalimaud Clinical Centre, Lisbon, Portugal
- 05.05 - 05.25 • **Importance of radiation dose and fraction: low doses**
Mariangela Massaccesi, Radiation Oncology, Policlinico A. Gemelli, Rome, Italy
- 05.30 - 05.50 • **Importance of dose-rate: FLASH**
Marie-Catherine Vozenin, RB, Hospital CHUV and University of Lausanne, Switzerland
- 05.55 - 06.15 • **Particle therapy: LET-dose painting**
Niels Bassler, Department of Clinical Medicine - DCPT - Danish Center for Particle Therapy, Aarhus, Denmark
- 06.20 - 06.40 • **An update on the radiation-induced bystander effect: lost in translation?**
Kevin Prise, Queen's University Belfast, Ireland
- 06.45 - 07.05 • **Reprogramming of tumor microenvironment by low dose radiotherapy**
Chandan Guha, Montefiore Medical Center, New York, USA
- 07.10 - 07.30 • **Personalized ultrafractionated stereotactic adaptive radiotherapy (PULSAR)**
Robert Timmermann, Department of Radiation Oncology, UT Southwestern Medical Center, Dallas, Texas, USA
- 07.35 - 07.55 • **Particle therapy, immunotherapy and targeted therapy: potentiation of immune anti-tumor response**
Marco Durante, Abteilung Biophysik, GSI Helmholtzzentrum für Schwerionenforschung, Darmstadt, Germany

08.00 - Concluding Remarks

08.15 Slavisa Tubin, Chair of the Organizing Committee

Learn more about the speakers



Niels Bassler, PhD, is currently Professor at the Department of Clinical Medicine at Aarhus University in Denmark. He completed his education at the Department of Physics and Astronomy at the Aarhus University in Denmark in 2006, and subsequently worked as post-doctoral fellow at the Department of Experimental Clinical Oncology at the Aarhus University Hospital until 2009. He then held the position of Senior Scientist / Research Group Leader and Associate Professor / Research Leader of the Dept. of Physics and Astronomy at Aarhus University, interspersed with an engagement as Senior Lecturer at the Department of Physics at Stockholm University in Sweden. From 2016 until 2020 he held a permanent position as Associate Professor at the Medical Radiation Physics Group / Dept. of Physics at Stockholm University, affiliated with the Karolinska Institutet, Dept. of Oncology and Pathology, and was simultaneously employed at the Department of Clinical Oncology at Aarhus University from 2018 until 2020.

Prof. Dr. **Marco Durante** is Director of the Biophysics Department at GSI Helmholtz Center for Heavy Ion Research (Darmstadt, Germany) and Full Professor of Physics at the Technical University of Darmstadt. He is also Adjunct Professor of Physics at the University of Naples Federico II in Italy, and at the Gunma College of Medicine in Japan. Dr. Durante got his Ph.D. in physics in 1992 at the University Federico II performing his studies at the Lawrence Berkeley Laboratory (Berkeley, CA, USA), and has worked as postdoc at the NASA Lyndon B. Johnson Space Center (Houston, TX, USA) and NIRS-QST (Chiba, Japan). He is generally recognized as world leader in the field of particle radiobiology and medical physics and is co-author of over 400 papers in peer-reviewed scientific journals (h-index=57) and one patent on proton therapy (EU patent WO2013083333). He is currently chair of the ESA Topical Team on Space Radiation and of the Particle Therapy Co-Operative Group (PTCOG), and member of the technical-scientific Committee of the Italian Hadrontherapy Center (CNAO). Dr. Durante was chair of the ESA Life Sciences Advisory Group 2016-2020 and President of the International Association for Radiation Research (IARR) 2011-2015, and is Associate Editor in several International scientific journals. He has received many grants to support his research, primarily by ESA, EU H2020, NIH, ERC, and BMBF. His main scientific achievements has been the assessment of the biological effects of accelerated charged particles using both in vitro systems and samples from humans (astronauts and cancer patients). He demonstrated the validity of space radiation risk models by comparing the mathematical results with biomarkers, and with similar techniques he proved that charged particle therapy can spare the immune system thus representing an ideal tool when combined to immunotherapy.



Carlo Greco, M.D., has been professionally active in the field of radiation oncology since 1992 following completion of his specialty training. In 1984 he earned a degree in Biology from the University of London, UK. In 1988 he received his Medical Degree from the University of Catania, Italy. In 1989 he was recruited as Research Fellow in the Radiobiology Laboratory at Memorial Sloan-Kettering Cancer Center (MSKCC) in New York where he actively worked on sensitization mechanisms in radiotherapy. In 1995 he joined the European Institute of Oncology (IEO) Milan, Italy, where he was instrumental in the implementation of advanced 3D-conformal radiotherapy (3D-CRT) with specific emphasis on the radical treatment of prostate cancer in collaboration with MSKCC. In the year 2000 he was appointed vice-chair of IEO's Department of Radiation Oncology. He became Professor of Radiation Oncology in 2004. In 2006 he was recruited in the department of Radiation Oncology at MSKCC and was involved in research projects aimed at establishing the role of PET/CT in radiotherapy. During the three years of research activity at MSKCC he developed protocols in image-guided single-dose radiotherapy (SDRT) and contributed to development of the current knowledge on the feasibility, efficacy and safety of this therapeutic approach in the management of primary and metastatic disease. In 2009 he was recruited by the University of Pisa, Italy to hold the position of Professor and Chair of the department of Radiation Oncology. Since 2011 Prof. Greco is the incumbent Director of Clinical Research at the Champalimaud Centre for the Unknown (CCU), a translational cancer research institute based in Lisbon. With his team, he has conducted several research studies of extreme hypofractionation and single dose radiation therapy in limited metastatic disease (oligometastasis) with PET/CT assessment of response. He is also actively engaged in the management of early stage primary disease with cutting-edge technology and investigator-driven clinical studies using advanced organ motion mitigation techniques and target tracking in prostate cancer. He has developed an innovative technique that enables the delivery of a single ablative dose of radiation. Results of a randomized clinical study comparing the established five session regimen versus a single ablative exposure in localized prostate cancer have recently been published in JAMA Oncology.

Chandan Guha, MBBS, PhD, is the Vice Chair of Radiation Oncology at the Albert Einstein College of Medicine (Einstein) and Montefiore Medical Center and Professor of Pathology, Urology, and Radiation Oncology at Einstein. He is also the founding director of Einstein's Institute for Onco-physics. Dr. Guha's research work is in the fields of immunology, radiation oncology, and liver diseases, and has been focused on two areas: 1. Immunotherapeutic approaches for cancer therapy, and 2. Use of regenerative strategies to repopulate injured tissue by use of stem cell-based technologies. As a clinician, he is also involved in treating prostate and liver cancers and is an investigator in several worldwide clinical trials.



Pedro Lara, M.D., Ph.D. currently is the Director and Head of the Oncology Department at the Canarian Comprehensive Cancer Center of San Roque University Hospital in Las Palmas (Gran Canaria, Spain), Full Professor for Oncology and Radiotherapy at the Universidad Fernando Pessoa Canarias, Director of the Canarian Institute for Cancer Research and serves as President of the Radiation Oncology National Commission of Spain and the Radiotherapy & Radiation Oncology Section at the U.E.M.S. Following his education in Spain (University of Granada) and trainings in Italy, the Netherlands and the USA, he started his clinical and academic career in Radiation Oncology at the Las Palmas University / University Hospital. He became a Full Professor at the institute in 1996 and Head of the Radiation Oncology Department in 2009. From 2013 until 2018, he served as Full Professor and Chair of Clinical Oncology and Hematology at the Las Palmas University, and from 2015 until 2021 he was Director of the University Oncology Campus of the Francisco de Vitoria University in Madrid. He has supervised 12 PhD students, is a member of a variety of professional associations and editorial boards and author of more than 100 indexed publications.

Mariangela Massaccesi graduated in Medicine and Surgery in 2003 at the School of Medicine and Surgery of the "Università Cattolica del Sacro Cuore" of Rome and completed her residency programme in Radiation Oncology in 2007. She currently works at the Gemelli ART (Advanced Radiation Therapy) Center of the Gemelli University Hospital of Rome, addressing his clinical and research interests especially on the multidisciplinary management of lung and head and neck cancers, stereotactic radiotherapy, re-irradiation, radio-immunotherapy combinations, and unconventional radiotherapy modalities such as spatially fractionated and low-dose fractionated radiotherapy. She is member of Associazione Italiana di Radioterapia e Oncologia Clinica (AIRO) and European Society of Radiotherapy and Oncology (ESTRO). At the Gemelli ART center, she is a member of the scientific and organizing committee of the "TRA4ART" (Technology Research Awareness in the ART network) initiative which promotes and manages organizational and clinical meetings, favoring the work of team and integration with other corporate structures within a network of five radiotherapy centers. Since 2016, she is also the local coordinator and one of the instructors of the Varian Advanced SRT Clinical School (14 editions so far) which is an international course about stereotactic radiotherapy which involves multiple professionals (radiation oncologists, medical physicists, and technicians). She is clinical investigator in following ongoing sponsored clinical trials in lung cancers: ImmunoSABR, KeyLink 012, KeyLink 013, Keynote 867. She is a teacher of the degree course in Medicine and Surgery at the "Università Cattolica del Sacro Cuore" in the framework of the Radiodiagnostics and Radiotherapy professional training. She coordinated the activities of the Study Group for Reirradiation of the Italian Association of Radiation Oncology (AIRO) (2016-2019). She is the author of 75 peer-reviewed papers published on international scientific journals with impact-factor and indexed on Pubmed, Scopus or WOS.



Dr. Majid Mohiuddin is a radiation oncologist practicing in Chicago as part of Radiation Oncology Consultants and the Northwestern Proton Center. He graduated medical school from Brown University and completed residency at the Massachusetts General Hospital (MGH), Harvard University. He has authored a number of peer-reviewed publications particularly in the area of Spatially Fractionated GRID Radiation Therapy (SFRT). He is currently a vice-chair of the Grid/Lattice/FLASH clinical working group of the Radiosurgery Society (RSS). He has been an invited speaker at the American Society for Radiation Oncology (ASTRO), the American College of Radiation Oncology (ACRO), the Radiosurgery Society (RSS), the American Association of Physicists in Medicine (AAPM), the American Association of Medical Dosimetrists (AAMD), National Institute of Health (NIH), and the US Food and Drug Agency (FDA). He has also lectured nationally/internationally on behalf of Varian Medical Systems, dot Decimal, and Ion Beam Applications (IBA). He has additional interests in international cancer care as part of the International Cancer Expert Core (ICEC) and provided expert training in high-dose rate (HDR) gynecological brachytherapy in Senegal in April 2013.

Yolanda Prezado is Research director at the French National Center for Scientific Research (CNRS). She is the founder and head of the interdisciplinary team New Approaches in Radiotherapy (NARA); based at the Institut Curie (France). The main research avenue of the NARA team is the conception and development of innovative methods in radiotherapy, with the aim of reducing its toxicity. Her main research interest is spatially fractionated radiation therapy. One of her main projects is proton minibeam radiation therapy, funded by the European Union via an ERC consolidator grant. Yolanda Prezado is a board certified medical physicist (Spain, France) with a multidisciplinary background. She has developed her career mainly in the field of radiotherapy, first at the University Hospital of Salamanca (Spain), then at the Biomedical BeamLine of the European Synchrotron Radiation Facility (Grenoble, France) and, since 2011, at the CNRS. She has been chair of the scientific committee of the European Federation of Medical Physicists and is the deputy spokesperson of the International Biophysics Collaboration. Her work in proton therapy has been rewarded with the Mr et Mme Peyre prize of the French Academy of Sciences in 2021.



Kevin M. Prise is Professor of Radiation Biology at the Patrick G Johnston Centre for Cancer Research at Queen's University Belfast since 2007. Prior to this, he was Head of the Cell and Molecular Radiation Biology Group at the Gray Cancer Institute in Northwood, London. He received his PhD in Cell Biology and Biochemistry, from the University of Aberdeen, on the mechanisms of action of the chemotherapeutic methotrexate. He joined the Gray Laboratory in 1985 working with Barry Michael, under the directorships of Jack Fowler, Julie Denekamp and Ged Adams. He has developed wide-ranging interests in radiation biology including research on low dose radiation risk, radiation quality, cell and tissue signalling mechanisms. His recent work is developing new biological based models for optimising the temporal and spatial aspects of advanced radiotherapies. A current focus is on the radiobiology of new laser-based approaches to probe extreme ultra-high dose-rate regimes. He is a Past-President of the Radiation Research Society, a previous RRS Michael Fry award recipient and Friedrich Dessauer awardee of the German Radiation Research Societies. He was the 2018 Douglas Lea Lecturer, (Institute of Physics and Engineering in Medicine) and the 2018 Bacq and Alexander awardee from the European Radiation Research Society. He has supervised 52 PhD students and has published over 360 papers (h=62), with over 12,800 citations.

Robert D. Timmerman, M.D., FASTRO, FACR, is Professor of Radiation Oncology and Neurosurgery, Chair of Radiation Oncology, and Effie Marie Cain Distinguished Chair in Cancer Therapy Research. His primary practice involves the treatment of adult and children with brain tumors. Dr. Timmerman graduated from Iowa State University with a bachelor's degree in nuclear engineering and a master's degree in reactor physics from the University of Tennessee. After finishing medical school in his home state of South Dakota, he completed a residency in radiation oncology at The Johns Hopkins Hospital. He was the principal investigator or co-investigator on several prospective trials designed to evaluate the efficacy and toxicity of stereotactic body radiation therapy in lung, liver, spine, and pelvic sites. He is the national principal investigator of Radiation Therapy Oncology Group (RTOG) trials using this therapy in patients with early stage lung cancer.



Dr. Slavisa Tubin Dr. Tubin is a 42-years-old board-certified radiation oncologist and scientific investigator from Austria, currently working as a director of clinical radiobiology and co-scientific director at the MedAustron Center for Particle Therapy and Research (W. Neustadt). His research interests include the use of photon-based stereotactic radiotherapy techniques and particles (protons, and especially carbon-ions) for induction of the immune-mediated non-targeted effects of radiotherapy: bystander and abscopal effects. Currently, he is a principle investigator of ongoing national and international, multi-centric, prospective studies on intentional induction of the abscopal and bystander effects among patients with oligometastatic and unresectable bulky tumors. He graduated at the University of Rome (ITA) "La Sapienza" in 2008, and then finished the residency-training also in Rome in 2012. During 2010-2011, he joined the University of Miami (USA) performing the preclinical in vitro and in vivo research on radiation-induced bystander and abscopal effects. The finding of those studies led to the development of a novel and unique technique for partial tumor irradiation targeting the hypoxic segment of bulky unresectable tumors for the clinical exploitation of bystander and abscopal effects. He was few times awarded for the best abstract presenting the preclinical and clinical findings related to this novel approach (2014 in Forli, ITA; 2016 in Klagenfurt, AUT; 2018 in Dublin, IRL; 2018 in Rimini, ITA; 2019 in Vienna, AUT). Dr. Tubin is currently leading the ESTRO focus group for innovative and unconventional radiotherapy techniques. He is adjunct professor by Albert Einstein College of Medicine in New York.

Marie-Catherine Vozenin is the Head of the Radiobiology at the Lausanne University Hospital (CHUV/UNIL) in Switzerland, where she also serves as Associate Professor Radiation Oncology. She is Adjunct Professor at the Department of Radiation Oncology at the University of California and INSERM researcher at the Institut Gustave Roussy in France. She has received Post-doctoral training at Peter McCallum in Melbourne and UAMS in Little Rock, USA. Together with her team she developed a novel modality of radiation therapy called FLASH-RT. The protection of normal tissue by FLASH-RT was termed the FLASH effect, resulting in a series of investigations to characterize the mechanisms involved. She has developed an extensive array of pre-clinical and clinical brain tumor model systems to recapitulate significant features of glioblastoma and the normal brain response to FLASH-RT, investigated the neuro-inflammatory response and immune infiltration and - after first clinical trials with domestic cat patients suffering from Squamous cell carcinoma - has worked to secure the translation of FLASH-RT into clinical trials for human patients with cancer.



Xiaodong Wu Xiaodong Wu, PhD, DABR, currently serves as President and CEO of Executive Medical Physics Associates in Miami, Florida, is Director of Medical Physics at the HCA Florida JFK Comprehensive Cancer Institute in Lake Worth and the Innovative Cancer Institute in South Miami, and Adjunct Professor of Biomedical Engineering at the University of Miami. He furthermore is Director of R&D at the Shanghai Proton and Heavy Ion Center in China and Co-Chair of the Physics, NCI/RSS Grid/Lattice, Microbeam, FLASH working group. He completed his education in Physics at the Xiamen University in China, and obtained his degrees in Radiological Sciences and Biomedical Engineering at the University of Miami. He previously served as Professor and Director of Medical Physics at the University of Miami Miller School of Medicine. In his current research, he focuses on Carbon Ion Radiation for Pancreatic Cancer.