



Radiobiology Pre-meeting course
Radiobiology of novel irradiation modalities
ESTRO 2021, 27-31 May 2021, Madrid, Spain

Friday, 27 August 2021 from 08:30-17:00

Course Directors:

Yolanda Prezado, Medical Physicist, Institut Curie (FR)

Marie-Catherine Vozenin, Radiobiologist, Centre Hospitalier Universitaire Vaudois (CH)

Course aim:

Enable participants to understand the multidisciplinary scientific aspects associated with discovery, exploration, validation, and translation of the benefits associated with distinct dose delivery methods, such as FLASH RT and spatially fractionated RT. The course will provide the most recent information related to the biology of these novel irradiation modalities.

Course objectives:

- To become familiar with the physics parameters used in FLASH-RT and SFRT
- To understand the physico-chemical events activated after FLASH-RT
- To understand how the downstream biological cascade can be modified after tissue exposure to FLASH-RT and SFRT
- To become familiar with the normal tissue and tumour response to SFRT and FLASH-RT
- To be able to develop a pre-clinical research program focused on FLASH-RT and/or SFRT from beams validation to identification of the relevant scientific questions
- To raise awareness concerning the challenging dosimetry in these modalities

Course attendance:

- Medical physicists and radiation oncologists interested in learning about new RT modalities
- Radiation and particle physicists as well as engineer wanting to optimize technology
- Radiation chemist wanting to explore possible new applications in physico-chemistry
- Radiation biologists seeking information on how to choose the best model and identify the relevant questions

Multidisciplinary teams are also welcome.

Speakers and panellists:

- Yolanda Prezado, Medical Physicist, Institut Curie (FR)
- Marie-Catherine Vozenin, Radiobiologist, Centre Hospitalier Universitaire Vaudois (CH)

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- Audrey Bouchet, Radiobiologist, Inserm (FR)
- Charles Limoli, Radiobiologist, University of California Medical Science (USA)
- Claude Bailat, Radiometry Group Leader, Lausanne University Hospital (CH)
- Immaculada Martinez Rovira, Researcher in Medical Physics, Universitat Autònoma de Barcelona (ES)
- Karen Kirkby, Medical Physicist, University of Manchester (UK)
- Pierre Montay-Gruel, Radiobiologist, Radiation Oncology Iridium Network – University of Antwerp (Belgium)
- Robert Griffin, Radiation Biologist, University of Arkansas (USA)

Time slot	Session 1 Title: The influence of time	Teacher
08:30-9:00	Setting the scene	
8:30-9:00	Borromean rings in radiation therapy: physics, biology and medicine	Yolanda Prezado
9:00-10:30	Session 1: The influence of time	
9:00-9:30	FLASH-RT: general overview and technology	Karen Kirkby
9:30-10:00	Dosimetry: special considerations in preclinical research	Claude Bailat
10:00-10:30	Physico-chemical aspects of FLASH-RT- Oxygen contribution from models to measurements	Charles Limoli
10:30-11:00	COFFEE BREAK	
11:00-11:30	Normal tissue response after FLASH RT. Biological mechanisms	Pierre Montay-Gruel
11:30-12:00	Tumour response after FLASH RT. Biological mechanisms	Marie Catherine Vozenin
12:00-13:30	LUNCH	
13:30-15:30	Session 2: The influence of space	
13:30-13:55	Overview of SFRT: general overview and technology	Yolanda Prezado
14:00-14.25	Dosimetry: special considerations in preclinical research	Immaculada Martinez Rovira
14.30-14.55	Normal tissue response to SFRT. Biological mechanisms	Audrey Bouchet
15.00-15.25	Tumour tissue response to SFRT. Biological mechanisms	Robert Griffin
15:30-16:00	COFFEE BREAK	
16:00-17:00	Session 3: towards the continuum	
16:30-17:00	<ul style="list-style-type: none"> - How to combine FLASH and SFRT? Which might be the best particle type to exploit FLASH and SFRT? - What model is relevant to investigate FLASH and SFRT? 	Marie Catherine Vozenin /Yolanda Prezado

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	<ul style="list-style-type: none">- In vivo/ in vitro including clinical trial with domestic animals- Beyond the classical RBE paradigm	
16:30-17:00	Round table: from pre-clinical studies to clinical applications	All
17:00	Close of pre-meeting	