Workshop Venue:

Sala Josep Marull lecture hall
Hospital del Mar
Universitat Pompeu Fabra
Campus Universitario MAR
Carrer del Dr. Aiguader 80
08003 Barcelona

Local Organisers:

Jaume Quera

Esther Catalán Suárez
Universitat Pompeu Fabra
Barcelona, Spain

Workshop Secretary:

Andrea Claes
Physikalisch-Technische Bundesanstalt (PTB)
Braunschweig, Germany

The workshop is funded by EMRP Joint Research Project SIB06 *Biologically weighted quantities in radiotherapy (BioQuaRT)*

Coordinator:

Hans Rabus
Physikalisch-Technische Bundesanstalt (PTB)
Braunschweig, Germany

Contact:

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www.ptb.de/emrp/bioquart.html

Keynote speakers and panel members:

Alejandro Carabe-Fernandez
Hospital of the University of Pennsylvania, USA

Oliver Jäkel
German Cancer Research Center, Germany

Simon Pimblott
The University of Manchester, UK

Reinhard Schulte
Loma Linda University, USA

Frank Verhaegen
MAASTRO clinic, The Netherlands

Workshop Chair:

Thorsten Schneider
Physikalisch-Technische Bundesanstalt (PTB)
Braunschweig, Germany

Scientific Committee:

Andrzej Kacperek, Clatterbrige Cancer Centre, UK

Karen Kirkby, University of Surrey, UK

Hugo Palmans, National Physical Laboratory, UK and EBG MedAustron, Austria

Massimo Pinto, ENEA, Italy

Hans Rabus, PTB, Germany

Thorsten Schneider , PTB, Germany

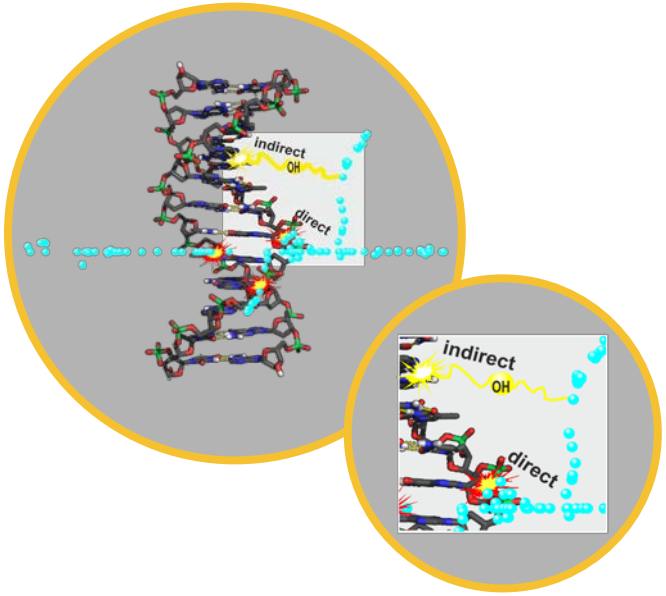
Reinhard Schulte, Loma Linda University, USA

Carmen Villagrasa, IRSN, France

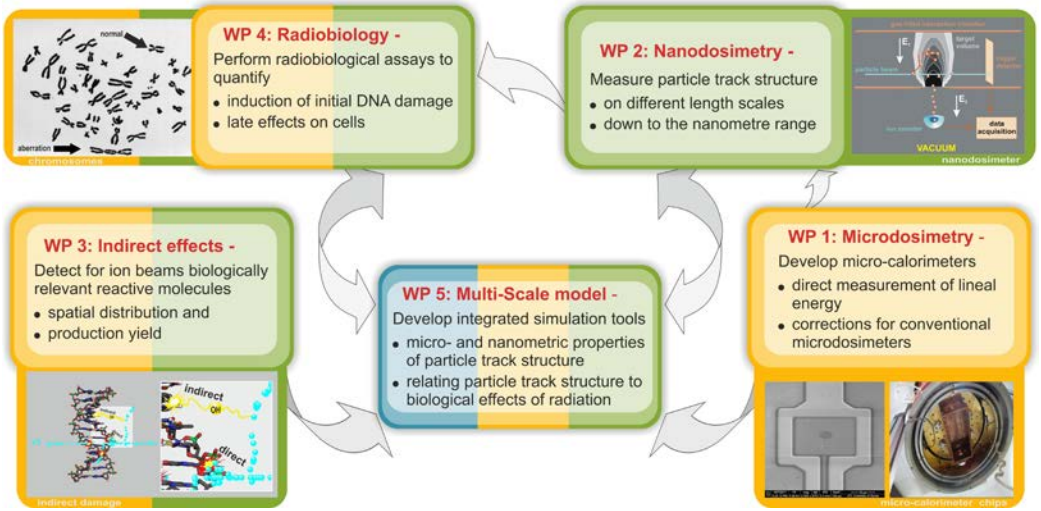
Jan Wilkens, Klinikum rechts der Isar, Germany

Towards biologically relevant dosimetry

International Workshop
22-23 April 2015, Barcelona



The BioQuaRT Project Biologically weighted quantities in radiotherapy



The Work Packages of the BioQuaRT Project and their interplay

The relevant length scales range from about 2 nm (diameter of the DNA double helix) to about 10 µm (diameter of the cell nucleus).

A multi-scale model that relates the characteristics of particle track structure to the biological consequences of radiation interaction has been developed and benchmarked with biological reference data obtained from irradiations of cultured tissue cells with well-characterised single-ion micro-beams.

In radiotherapy, dosage is quantified by means of the absorbed dose to water, and non-conventional radiotherapy modalities like proton and ion beams require an additional weighting factor to account for increased tumor cell mortality.

The growing use of these radiotherapy modalities, and especially the combined use of several modalities within a single treatment plan, raises the need to establish a new dosimetric concept which allows a transparent separation of the physical processes (dependant on modality) from the biological ones (independent of modality) to ensure consistency of dose prescription across the different techniques.

The foundation for this ambitious goal is being laid in the Joint Research Project "Biologically weighted quantities in radiotherapy" (BioQuaRT) which is carried out within the framework of the European Metrology Research Programme (EMRP). BioQuaRT aims at developing measurement and simulation techniques for determining the physical properties of ionising particle track structured on different length scales, and at investigating at the cellular level how these track structure characteristics correlate with the biological effects of radiation. It is structures into five Work Packages (WPs): Micro- and Nanodosimetry, Indirect Effects, Radiobiology and Multi-scale Model.

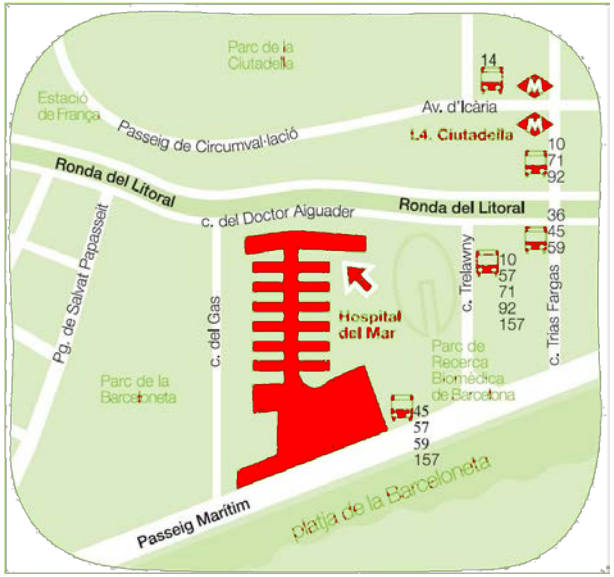
Towards biologically relevant dosimetry

The final workshop of the BioQuaRT project aims at disseminating results of the project work to stakeholders in medicine and society and at stimulating further innovation and research within the European community. The workshop is recommended by ESTRO and organised immediately before the 3rd ESTRO Forum.

Participation in the workshop is free of charge. Attendees may present posters related to the overall workshop topic. Detailed information on the workshop and the programme can be found online at:
www.ptb.de/emrp/bioquart_2015.html

To facilitate the workshop organisation, all interested participants are kindly requested to register online.

The workshop will also cover results of the project *MIcrodosimetria e struttura di TRAccia (MITRA)* which was started at the BioQuaRT SIB06-REG1 home organisation INFN to supplement research within BioQuaRT.



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