

## Fees, Booking and Registration

The cost for the 4-day course is £500 if booked by 20 March, otherwise £550. For the first two days only (Basic Radiobiology) or the final two days (Radiobiological Modelling) the cost is £270 before 20 March, otherwise £300.

**Registration deadline: 17<sup>th</sup> April.**

**(Please note that the full course runs from Tuesday until Friday)**

The fee includes notes on each lecture (including reference lists), a CD of the presentations (as pdf files), the course dinner, lunches, coffee/tea and light refreshments. Accommodation is available at the course venue at discounted rates [www.chestergrosvenor.com](http://www.chestergrosvenor.com)

### Registration Form

Name: \_\_\_\_\_

Organisation: \_\_\_\_\_

Address: \_\_\_\_\_  
\_\_\_\_\_

Postcode (or equivalent): \_\_\_\_\_

Telephone: \_\_\_\_\_ Mobile: \_\_\_\_\_

Email : \_\_\_\_\_ Fax: \_\_\_\_\_

I would like to enroll for the **Full Four Days\*** / **First Two Days\*** / **Final Two Days\***

I **wish\*** / **do not wish\*** to attend the course dinner on the Wednesday evening

\*Delete as appropriate

I enclose a cheque for the full amount of £ \_\_\_\_\_ payable to:

*“Clatterbridge Centre of Oncology (28 April – 1 May 2009)”*

Or by Credit Card - MasterCard/Visa/American Express only accepted

MasterCard  American Express  Visa

Card No: \_\_\_\_\_ Expiry Date: \_\_\_\_\_

3 digit sec. code: \_\_\_\_\_ Signature: \_\_\_\_\_

Address of Cardholder: \_\_\_\_\_  
\_\_\_\_\_

**If you wish to pay by direct bank transfer, please send an email to Sue Nixon (see below) - the necessary details will then be sent by return email.**

Please mail the completed form, and forward payment (if cheque) to:  
**Sue Nixon, Radiobiology Course Secretary**, Physics Department, Clatterbridge Centre for Oncology, Clatterbridge Road, Bebington, Wirral CH63 4JY, UK

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A course on

# Radiobiology & Radiobiological Modelling in Radiotherapy

7 category-1 CPD points per day  
(Royal College of Radiology UK) awarded

**28 April – 1 May 2009**

The Chester Grosvenor Hotel and Spa,  
Chester, UK

Clatterbridge Centre for Oncology   
NHS Foundation Trust

Information also at:  
<http://www.wirral.nhs.uk/uploads/documents/CCORBLGYCOURSEFLYERApril09.pdf>

## Teaching faculty

**Don Chapman** PhD, Penticton, BC Canada (formerly Head of Radiobiology research, Fox-Chase Cancer Centre, Philadelphia) – Fundamentals of cell radiobiology; the Linear-Quadratic model; Molecular imaging of the tumour microenvironment (e.g. hypoxia).

**Professor Roger Dale**, Imperial College, London, UK – Radiobiology of Brachytherapy, models for effects of different doserates; The interaction of Chemo- and Radio-therapy.

**Dr. Charles Deehan**, Guys and St. Thomas' NHS Trust, London, UK – Isoeffect calculations for different fractionation regimens; Corrections for gaps in treatment schedules.

**Professor Trevor McMillan**, Lancaster Univ., UK - DNA damage due to radiation and its repair.

**Professor Hooshang Nikjoo**, Karolinska Institute, Stockholm, Sweden – Radiation interactions, Track Structure; Bystander Effects.

**Dr. Marco Schwarz**, NW Proton Therapy Centre, Boston, Mass., - Use of EUD, TCP, NTCP in optimising treatment plans; Individualising prescription dose to lung tumours based on NTCP.

**Dr. Catharine West**, Academic dept. of Radiation Oncology, Christie Hospital, Manchester, UK – The Genomic Revolution and Radiotherapy.

**Dr. Ellen Yorke**, MSKCC, New York, NY, USA – The QUANTEC update of the 'Emami' parameters for Normal-Tissue Complication Probability (NTCP); Models for predicting NTCP – conceptual basis, mathematical formalisms, applications..

**Dr. John Fenwick**, CCO – Statistical methods used in Dose-Volume-Complication analyses; Delay-Differential Equations and the Dose-Time dependence of early radiotherapy reactions.

**Dr. Andrzej Kacperek**, CCO – Radiobiological aspects of Heavy-Particle Therapy (protons, carbon ions, neutrons).

**Dr. Geoff Lawrence**, CCO – Cancer induction by radiation; application to radiotherapy plans.

**Dr. Zaf Malik**, CCO – Biomathematical modeling – from the drawing board to the clinic.

**Dr. Philip Mayles**, CCO - Achieving clinical acceptance of Radiobiologically based plans.

**Professor Alan Nahum**, CCO – Introduction to Biological models in Radiotherapy; Models for predicting tumour local control probability (TCP); Applications of TCP modeling.

**Dr. Isabel Syndikus**, CCO – Clinical perspective on Normal-Tissue Complications.

**Dr. Carol Walker**, CCRT – Molecular pathology, Therapy response and Outcome in Gliomas.

**Professors Wolfgang Tomé** and **Robert Jeraj**, U. of Wisconsin, Madison – guest lecturers on radiobiological optimisation and the use of functional imaging respectively.

**Kjell Eriksson**, of *RaySearch Laboratories* ([www.raysearchlabs.com](http://www.raysearchlabs.com); Stockholm), 'biological' optimization software specialists (e.g. Pinnacle; Oncentra/Masterplan; Eclipse), will run practical exercises on using biological models in plan evaluation and optimisation.

The course provides the background to understand both the basis of radiation treatment for cancer and the use of radiobiological models in the evaluation and optimisation of radiotherapy treatment plans. It is suitable for anyone involved in Radiotherapy: Radiation Oncologists (especially those in training for (UK) FRCR part I), Physicists, Therapy Radiographers, Researchers and University Teachers. Days 1 and 2 will cover fundamentals – clonogenic assays, cellular response to radiation, the effect of dose rate, radiation quality (LET), cell-cycle effects, the influence of oxygen, the linear-quadratic (LQ) formula and its limitations, the 5 Rs of Radiotherapy, the principles of fractionation and specific considerations in LDR and HDR brachytherapy. Days 3 and 4 are dedicated to the basis and use of radiobiological models (TCP, NTCP, EUD) in both the evaluation and optimisation of radiotherapy treatment plans. This is the first-ever course giving extensive coverage, including hands-on practice, to these modeling tools, which are beginning to be available in commercial treatment planning systems.

The teaching faculty is composed of Radiobiologists, Radiation Physicists and Radiatic Oncologists who are internationally known for their research and are experienced teachers of various aspects of Radiobiology and its application to Radiotherapy.

Students are encouraged to bring with them, in poster format, presentations of Radiobiological Modelling work from their own departments; these will be displayed during the course.

## VENUE

All the lectures and practical sessions will take place at **The Chester Grosvenor and Spa**, Eastgate, Chester CH1 1LT, Cheshire, UK ([www.chestergrosvenor.com](http://www.chestergrosvenor.com)). The Chester Grosvenor is in the heart of the old Roman city of Chester, some 25 miles from Liverpool, and within reach of both Manchester and Liverpool airports.

By arrangement, it will be possible to view the spacious and modern Radiotherapy facilities at the Centre, which include the UK's only proton-therapy facility as well as *cone-beam* and 4D CT.

**Course Organisers:** *Prof. Alan E. Nahum, Physics Dept. and Consultant Dr. Pooja Jain, Radiotherapy Dept., Clatterbridge Centre for Oncology*  
[alan.nahum@ccotrust.nhs.uk](mailto:alan.nahum@ccotrust.nhs.uk); tel: +44 (0)151 334 1155 extn. 4169  
[pooja.jain@ccotrust.nhs.uk](mailto:pooja.jain@ccotrust.nhs.uk); tel: +44 (0)151 334 1155 extn. 5915.

