



# Pre-Conference Workshop

on

## "Radiobiology & Radiobiological Modelling in Radiotherapy"

19<sup>TH</sup> November 2015

Venue : RCC, Thiruvananthapuram

**Organized By**

Division of Radiation Physics  
Regional Cancer Center  
Thiruvananthapuram  
Kerala, India



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- 8.30 - 9.30      *Registration*
- 9.30 - 9.45      *Welcome note*  
                         *- Dr. Raghuram K Nair*
- 9.45 - 10.00      *Course Introduction*  
                         *- R Holla*
- 10.00 - 10.45      *The Radiobiological rationale for Radiotherapy*  
                         *- Dr. B S Rao*
- 10.45 - 11.00      *Tea Break*
- 11.00 - 11.45      *Normal-tissue morbidity following Radiotherapy*  
                         *- Dr. Atmaram Pai*
- 12.00 - 12.45      *The Linear-Quadratic model of cell killing by ionising radiation*  
                         *- Dr. B S Rao*
- 13.00 - 14.00      *Lunch Break*
- 14.00 - 15.00      *Radiobiological models of tumour and normal-tissue response*  
                         *- Dr. A E Nahum*
- 15.00 - 15.15      *Tea Break*
- 15.15 - 16.00      *The use of TCP and NTCP models in treatment plan optimisation*  
                         *- Dr. A E Nahum*
- 16.05 - 16.30      *Discussion*  
                         *- All participants and Faculty*
- 16.30 - 16.50      *Course feedback and close of the course*

## A brief introduction of faculty



### **Dr. A E Nahum**

Until his retirement at the end of October, Alan Nahum was Head of (Radiotherapy) Physics Research at Clatterbridge Cancer Centre (CCC) near Liverpool, UK and Visiting Professor at Department of Physics, Liverpool University.

He completed his PhD on Theoretical Radiation Dosimetry from Edinburgh University in 1975. Between 1985 and 2002 he was employed by the Institute of Cancer Research (ICR), Royal Marsden Hospital (RMH), Sutton and London UK where he developed a quasi-mechanistic radiobiological model for tumour control probability (TCP) - the 'Marsden' TCP model. This model and various NTCP models were incorporated into the BIOPLAN software written by Dr. Beatriz

Sanchez-Nieto. Short spells as 'visiting scientist' followed at Fox-Chase Cancer Center (Philadelphia), Reggio Emilia (Italy) and Copenhagen University hospital.

In 2004 he joined Clatterbridge Cancer Centre and expanded his interests in radiobiological optimisation of treatment planning. In 2006 he set up the 4-day ESTRO supported Clatterbridge radiobiological modelling course. Together with postdoctoral researcher Dr. Julien Uzan the BioSuite software was developed, which can optimize 'isotoxically' the tumour dose as a function of the number of fractions. Handbook of Radiotherapy Physics – Theory and Practice (co-edited with Philip Mayles and Jean-Claude Rosenwald) appeared in 2007. He co-wrote Radiotherapy Treatment Planning - Linear-Quadratic Radiobiology with Don Chapman (CRC Press 2015).

He has (co-)authored close to 200 publications, divided between peer-reviewed journal articles, chapters in books and papers in conference proceedings, approximately equally divided between Radiation Dosimetry and Radiobiology.



### **Dr. B S Rao**

Dr Badanidiyoor Srinivasa Rao started his service as a scientific officer at BARC after graduating from the 12th batch of BARC training school in 1969. He obtained his Ph.D degree in biophysics in 1978 from the erstwhile Cancer Research Institute. During his post-doctoral studies in (1980-82) he undertook mammalian cell radiobiology in the department of Therapeutic Oncology MCMC, Wisconsin, USA. His research activities have been mainly in the areas of biophysical aspects of radiation quality, radiobiology, radiation cytogenetics and mutagenesis. He was a recipient of Madam Marie Curie fellowship of the European Commission in the year 1995 and worked on the application of translocation assay in biodosimetry at the University of Leiden, The Netherlands.

He has served as an IAEA expert in biodosimetry and has published more than 100 scientific papers in several peer-reviewed journals. He had the honour of being on the Editorial Board of International Journal of Radiation Biology (UK). He also edited the Journal of Radiation Protection and Environment, and EMSI newsletter for several years. He retired from BARC in 2005 as the Head of Radiological Physics and Advisory Division.

## **Dr. Atmaram Pai**



Dr. Atmaram Pai Panandiker is currently a pediatric radiation oncologist and research consultant at the Scripps Proton Therapy Center in San Diego, California. He began his research career in the cellular biology program associated with the Howard Hughes Medical Institute at the US National Institutes of Health in 2000. This evolved into a focus in the radiation oncology sciences; his radiobiology training began in 2003, in the laboratories of James Mitchell and Kevin Camphausen of the US National Cancer Institute, where he developed a phase II study of an adult high grade glioma radiosensitizer. From there, he moved to a research position at St. Jude Children's Research Hospital in 2007, where he focused on pediatric cancer care and designing institutional and multi-center cooperative group clinical trials.

He continues to serve on multiple cooperative group committees related to frontline clinical protocol development. While there, he began pediatric tumor radiosensitization studies of multiple histiotypes. With 3 years of proton beam therapy experience, his current position seeks to integrate proton radiobiology research with clinical management of multiple pediatric proton therapy centers around the globe. Current clinical work has incorporated intensity modulated proton therapy for pediatric patients as well as startup of a joint laboratory venture between Rady Children's Hospital, Scripps Proton Therapy Center, and the University of California, San Diego.

### **Workshop Registration Details:**

The seats are limited to 150 only. Registration is mandatory for participation in this workshop.  
No Spot registration is possible.

### **Registration Charges:**

For PGs/Residents/Students: Rs 350 only  
For others : Rs 500 only

### **Venue:**

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