

**Radiation Research Society
Scholars In Training (SIT)
Newsletter – February 2013, Issue 126**



RRS MEETING SITE



RRS 2013 – NEW ORLEANS, LA
SEPTEMBER 15-19, 2013

Abstract Submission Deadline Approaching for RRS 2013!

Deadline is March 12, 2013.

<http://abstractsonline.com/submit/login.asp?mkey=%7b01C994CE-9545-4EC7-8580-D74360FA8373%7d>

Tentative SIT Workshop Schedule!

Theme: Low Dose

8:30 am - 9:00 am: Registration/Breakfast

9:00 am – 9:55 am: **Yosef Shiloh**, Tel Aviv University – Introductory Speaker – “How I made my career accomplishments”

10:00 am – 10:40 am: **Doug Boreham**, McMaster University - bystander effect for low LET gamma-radiation

10:45 am – 11:00 am: Coffee Break

11:00 am – 12:00 pm: Interactive Session

Career Development: Training opportunities for radiation scientists in the US and Europe

-**Ming Lei**, National Cancer Institute National Institutes of Health

-**Iris Eke**, National Center for Radiation Research in Oncology, Dresden

How to give a presentation

-**Mike Joiner**, Wayne State University

12:15 pm – 1:15 pm: Lunch

1:30 pm – 1:55 pm: **Paul Wilson**, BNL – effects of low LET ionizing radiation on normal, tumor and DNA damage signaling and repair-deficient cells, tissues and animal models

2:00 pm – 2:25 pm: **George Iliakis**, University of Duisburg-Essen –

DNA damage from the perspective of a physicist

2:30 pm – 2:55 pm: **Carmel Mothersill**, McMaster University – risks of very low doses of ionizing radiation to humans and the environment

3:00 pm – 3:15 pm: Coffee Break

3:15 pm – 3:40 pm: **Don Jones**, University of Leicester – mechanisms, measurement and consequences of radiogenic, oxidative and drug-induced damage to DNA

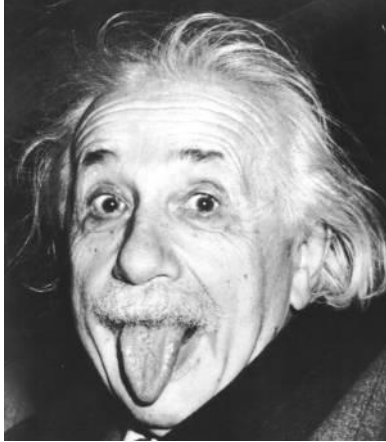
3:45 pm – 4:10 pm: **Charles Limoli**, University of California, Irvine – the adverse effects of exposure to the space radiation environment, where in vitro and in vivo models are used to define biological responses to charged particle irradiation

4:15 pm – 4:40 pm: **Bill Morgan**, Pacific Northwest National Laboratory – Discussion session – Wrap up

4:45 pm: Adjourn

Don't Forget we will have a SIT social following the workshop. Look for upcoming details!

New this year: Ask you mentor and/or affiliation (University, Hospital, etc) to contribute to the support of our workshops and SITs. The pictures of supporters/ institutions will be featured in the upcoming workshop.



Mentors Lunch suggestions!

Do you have any suggestions for potential mentors for the “Mentors Lunch” event?

All SITs who contribute will have their names featured during this event!

Please send your suggestions to Elizabeth Moore; elmoore2@wakehealth.edu

New Website!

RRS has launched a new website! We are still at the old address but now there are many new features, including a career section for SITs! Please take the time to go through the website and explore the new networking opportunities we have for you!

HOME NEWS EVENTS GOVERNANCE RADIATION RESEARCH SIT CAREER POSTINGS GROUPS

RRS MEMBERS IN MOTION

CONTACT US | SIGN IN | REGISTER | PRINT PAGE

Save the Date! SEPTEMBER 15-19, 2013
59th Annual Meeting of the Radiation Research Society

NEW ORLEANS RIVERSIDE HILTON NEW ORLEANS, LA

Welcome to Radiation Research Society

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IARR International Association For Radiation Research

CALENDAR OF EVENTS [more](#)

12/1/2012
Weekly Luncheon

12/8/2012
Marketing Lunch Meeting

12/31/2012
End of the Year Meeting

LATEST NEWS [more](#)

12/1/2012
Weekly Luncheon

12/8/2012
Marketing Lunch Meeting

12/31/2012
End of the Year Meeting

NEWEST MEMBERS

Elizabeth Allen

Christopher Rick

Elizabeth Allen

Christopher Rick

Elizabeth Allen

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Password

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Forgot your password?

Not a member yet?

RADIATION RESEARCH SOCIETY
 Managing Director: Veronica Haynes exec@radres.org
 Member & Journal Services: Scott Starr members@radres.org
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SIT Publications

Are you a SIT member and just had a publication accepted? Highlight your accomplishments here in the SIT Newsletter! Just email your citation and abstract to: sit.radres@gmail.com

An in vitro study of the radiobiological effects of flattening filter free radiotherapy treatments.

King RB, Hyland WB, Cole AJ, **Butterworth KT**, McMahon SJ, Redmond KM, Trainor C, Prise KM, McGarry CK, Hounsell AR.

Phys Med Biol. 2013 Mar 7;58(5):N83-94.

Radiotherapy Physics, Northern Ireland Cancer Centre, Belfast Health and Social Care Trust, BT9 7AB, UK.

Flattening filter free (FFF) linear accelerators allow for an increase in instantaneous dose-rate of the x-ray pulses by a factor of 2-6 over the conventional flattened output. As a result, radiobiological investigations are being carried out to determine the effect of these higher dose-rates on cell response. The studies reported thus far have presented conflicting results, highlighting the need for further investigation. To determine the radiobiological impact of the increased dose-rates from FFF exposures a Varian Truebeam medical linear accelerator was used to irradiate two human cancer cell lines in vitro, DU-145 prostate and H460 non-small cell lung, with both flattened and FFF 6 MV beams. The fluence profile of the FFF beam was modified using a custom-designed Nylon compensator to produce a similar dose profile to the flattened beam (6X) at the cell surface but at a higher instantaneous dose-rate. For both cell lines there appeared to be no significant change in cell survival. Curve fitting coefficients for DU145 cells irradiated with constant average dose-rates were 6X: $\alpha = 0.09 \pm 0.03$, $\beta = 0.03 \pm 0.01$ and 6FFF: $\alpha = 0.14 \pm 0.13$, $\beta = 0.03 \pm 0.02$ with a significance of $p = 0.75$. For H460 cells irradiated with the same instantaneous dose-rate but different average dose-rate the fit coefficients were 6FFF (low dose-rate): $\alpha = 0.21 \pm 0.11$, 0.07 ± 0.02 and 6FFF (high dose-rate): $\alpha = 0.21 \pm 0.16$, 0.07 ± 0.03 , with $p = 0.79$. The results indicate that collective damage behaviour does not occur at the instantaneous dose-rates investigated here and that the use of either modality should result in the same clinical outcome, however this will require further validation in vivo.

Molecular Pathways : Radiation-induced cognitive impairment.

Greene-Schloesser D, Moore E, Robbins ME.

Clin Cancer Res. 2013 Feb 6. [Epub ahead of print]

Radiation Oncology, Wake Forest School of Medicine.

Abstract

Approximately 200,000/year in the US will receive partial or whole brain irradiation for the treatment of primary or metastatic brain cancer. Early and delayed radiation

effects are transient and reversible with modern therapeutic standards; yet late radiation effects (≥ 6 months postirradiation) remain a significant risk, resulting in progressive cognitive impairment. These include functional deficits in memory, attention, and executive function that severely affect the patient's quality of life (QOL). The mechanisms underlying radiation-induced cognitive impairment remain ill defined. Classically, radiation-induced alterations in vascular and glial cell clonogenic populations were hypothesized to be responsible for radiation-induced brain injury. Recently, preclinical studies have focused on the hippocampus, one of two sites of adult neurogenesis within the brain, which plays an important role in learning and memory. Radiation ablates hippocampal neurogenesis, alters neuronal function, and induces neuroinflammation. Neuronal stem cells implanted into the hippocampus prevent the decrease in neurogenesis and improve cognition following irradiation. Clinically prescribed drugs, including PPAR α and γ agonists, as well as RAS blockers, prevent radiation-induced neuroinflammation and cognitive impairment independent of improved neurogenesis. Translating these exciting findings to the clinic offers the promise of improving the QOL of brain tumor patients who receive radiotherapy.

Interesting Articles

Neuroanatomical target theory as a predictive model for radiation-induced cognitive decline.

Peiffer AM, Leyrer CM, Greene-Schloesser DM, Shing E, Kearns WT, Hinson WH, Tatter SB, Ip EH, Rapp SR, Robbins ME, Shaw EG, Chan MD.

Neurology. 2013 Feb 19;80(8):747-53. doi: 10.1212/WNL.0b013e318283bb0a. Epub 2013 Feb 6.

Source

From the Department of Radiation Oncology (A.M.P., C.M.L., D.M.G.-S., W.T.K., W.H.H., M.E.R., E.G.S., M.D.C.), Graduate Neuroscience Program (E.S.), Department of Neurosurgery (S.B.T.), Department of Psychiatry (S.R.R.), Department of Public Health Sciences-Biostatistics (S.R.R., E.H.I.), and Brain Tumor Center of Excellence (A.M.P., D.M.G.-S., S.B.T., S.R.R., M.E.R., E.G.S., M.D.C.), Wake Forest School of Medicine, Winston-Salem, NC.

Abstract

OBJECTIVE:

In a retrospective review to assess neuroanatomical targets of radiation-induced

cognitive decline, dose volume histogram (DVH) analyses of specific brain regions of interest (ROI) are correlated to neurocognitive performance in 57 primary brain tumor survivors.

METHODS:

Neurocognitive assessment at baseline included Trail Making Tests A/B, a modified Rey-Osterreith Complex Figure, California or Hopkins Verbal Learning Test, Digit Span, and Controlled Oral Word Association. DVH analysis was performed for multiple neuroanatomical targets considered to be involved in cognition. The %v10 (percent of ROI receiving 10 Gy), %v40, and %v60 were calculated for each ROI. Factor analysis was used to estimate global cognition based on a summary of performance on individual cognitive tests. Stepwise regression was used to determine which dose volume predicted performance on global factors and individual neurocognitive tests for each ROI.

RESULTS:

Regions that predicted global cognitive outcomes at doses <60 Gy included the corpus callosum, left frontal white matter, right temporal lobe, bilateral hippocampi, subventricular zone, and cerebellum. Regions of adult neurogenesis primarily predicted cognition at %v40 except for the right hippocampus which predicted at %v10. Regions that did not predict global cognitive outcomes at any dose include total brain volume, frontal pole, anterior cingulate, right frontal white matter, and the right precentral gyrus.

CONCLUSIONS:

Modeling of radiation-induced cognitive decline using neuroanatomical target theory appears to be feasible. A prospective trial is necessary to validate these data.

18F-FLT PET During Radiotherapy or Chemoradiotherapy in Head and Neck Squamous Cell Carcinoma Is an Early Predictor of Outcome.

Hoeben BA, Troost EG, Span PN, van Herpen CM, Bussink J, Oyen WJ, Kaanders JH.

J Nucl Med. 2013 Jan 23. [Epub ahead of print]

Abstract

This prospective study used sequential PET with the proliferation tracer 3'-deoxy-3'-(18)F-fluorothymidine ((18)F-FLT) to monitor the early response to treatment of head and neck cancer and evaluated the association between PET parameters and

clinical outcome.

METHODS: Forty-eight patients with head and neck cancer underwent (18)F-FLT PET/CT before and during the second and fourth weeks of radiotherapy or chemoradiotherapy. Mean maximum standardized uptake values for the hottest voxel in the tumor and its 8 surrounding voxels in 1 transversal slice (SUV(max(9))) of the PET scans were calculated, as well as PET-segmented gross tumor volumes using visual delineation (GTV(VIS)) and operator-independent methods based on signal-to-background ratio (GTV(SBR)) and 50% isocontour of the maximum signal intensity (GTV(50%)). PET parameters were evaluated for correlations with outcome.

RESULTS: (18)F-FLT uptake decreased significantly between consecutive scans. An SUV(max(9)) decline $\geq 45\%$ and a GTV(VIS) decrease \geq median during the first 2 treatment weeks were associated with better 3-y disease-free survival (88% vs. 63%, $P = 0.035$, and 91% vs. 65%, $P = 0.037$, respectively). A GTV(VIS) decrease \geq median in the fourth treatment week was also associated with better 3-y locoregional control (100% vs. 68%, $P = 0.021$). These correlations were most prominent in the subset of patients treated with chemoradiotherapy. Because of low (18)F-FLT uptake levels during treatment, GTV(SBR) and GTV(50%) were unsuccessful in segmenting primary tumor volume.

CONCLUSIONS: In head and neck cancer, a change in (18)F-FLT uptake early during radiotherapy or chemoradiotherapy is a strong indicator for long-term outcome. (18)F-FLT PET may thus aid in personalized patient management by steering treatment modifications during an early phase of therapy.

Upcoming Professional Meetings and Courses

Symposium on Small Animal RadioTherapy, 3-5 March 2013, Maastricht, the Netherlands

The symposium will bring together various disciplines in the new field of image-guided precision radiotherapy for small animals. In a full 2-day program various aspects of this developing field of research will be highlighted: cancer biology, radiotherapy side effects (acute and late), novel radiotherapy strategies for cancer and other diseases, synergy of radiation with drugs, development of novel irradiation technology, novel imaging methods, pre-clinical studies, and much more...

The symposium aims to allow biologists, physicists, physicians and other scientists to exchange ideas on modern small animal pre-clinical radiation research. It will also be a forum to identify current limitations of the technology and the science.

Manufacturers of modern animal irradiation and imaging equipment will actively participate in the meeting.

Who should participate: If you are a scientist working in the field of precision radiotherapy or imaging with small animals, in particular for cancer, but also for other diseases, you should consider participating in this exciting symposium to share your ideas and experience and expand your network. If you recently set up a small animal irradiation device or are considering acquiring one, you should not miss this unique opportunity. It will provide you with a wealth of useful information and facilitate the scientific exchange with other investigators in the field. Early registration is highly recommended because the number of participants is limited to 100, to stimulate discussion.

Symposium sessions

Novel technical developments: irradiation technology

Novel technical developments: imaging technology (Optical, PET, SPECT, image fusion, ...)

Animal models for spontaneous and radiation induced cancers

Advanced radiotherapy trials

Hypoxia, angiogenesis, : factors influencing response

Normal tissue effects of radiation

Other diseases than cancer

Practical research workflow

Translation from animals to humans

Future research directions

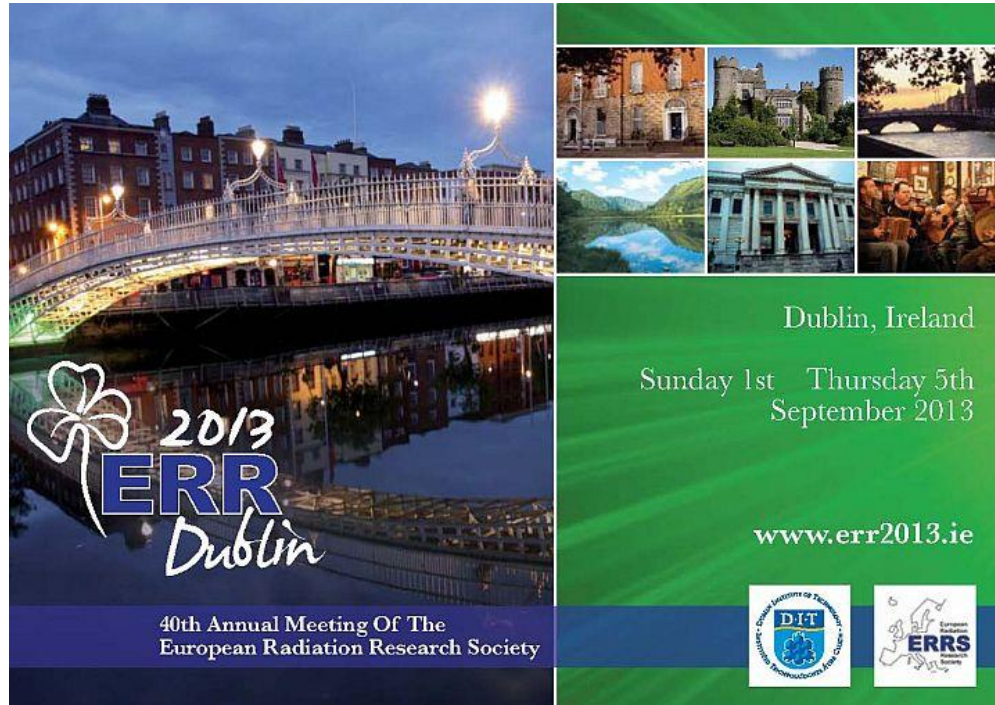
Treatment planning

New developments

Symposium confirmed speakers

Dirk de Ruyscher (University Leuven, Belgium), David Jaffray (Princess Margaret Hospital, Canada), Dick Hill (University of Toronto, Canada), Olaf van Tellingen (Netherlands Cancer Institute, Netherlands)

Symposium organizers Frank Verhaegen, Marc Vooijs, MAASTRO – Maastricht Radiation Oncology, GROW - School for Oncology and Developmental Biology, Maastricht University



On behalf of the Irish Radiation Research Society, we invite you to attend the 40th Annual Meeting of the European Radiation Research Society in Dublin from Sunday 1st to Thursday 5th September 2013. The European Radiation Research Society (formerly the European Society of Radiation Biology) was founded in 1959 with the aim of promoting radiation research. The Annual Meeting of the Association for Radiation Research (UK) will be held jointly with ERR2013. The scientific programme will cover all of the major disciplines of radiation science including physics, chemistry, biology, medicine, and radiation protection.

We look forward to welcoming you to Dublin!

Call for abstracts 16th January 2013

Deadline for submission of abstracts 1st April 2013

Notification of acceptance of abstracts 8th May 2013

Deadline for early registration 6th June 2013

Conference dates 1st – 5th September 2013

Submissions for the scientific programme are invited from interested participants. Proposals for oral and poster presentations will be accepted. Please see the conference website for details on the format of submissions and abstracts.

Please see the conference website www.err2013.ie for regular updates.

For further information on accommodation, social programme and registration please contact:

Elva Hickey, Conference Partners Ltd, 2nd Floor, Heritage House, Dundrum Office Park Dundrum, Dublin 14, Ireland. Tel: + 353 1 296 9391 Fax: +353 1 296 8678 Email: elva@conferencepartners.ie

If you would like further information on the programme or the call for abstracts, please contact:

Fiona Lyng, DIT Kevin Street, Dublin 8. Tel: +353 402 7972 Email: fiona.lyng@dit.ie



2013 ASTRO Annual Meeting

September 22 - 25, 2013

Georgia World Congress Center, Atlanta

ASTRO's Annual Meeting is the premier radiation oncology scientific event in the world and draws more than 11,000 attendees each year. During the 2013 Annual Meeting, we will look at patient-centered care and the importance of the physician's role in helping with patient reported outcomes and the quality and safety of patient care.

For more information, please see the website; <https://www.astro.org/Meetings-and->



2nd ESTRO Forum 2013

April 19-23 2013

Geneva, Switzerland

Built on the success of the London Anniversary in 2011, the ESTRO Forum is following the concept of gathering several meetings reflecting the various aspects of the radiation oncology arena. The Clinical & Translational meeting, the GEC-ESTRO-ISIORT meeting, the Physics Biennial meeting, the RTT meeting, and the PREVENT (Prediction, Recognition, Evaluation and Eradication of Normal Tissue effects of radiotherapy) meeting will altogether foster interdisciplinarity and exchanges between the professionals of radiotherapy.

For more information, please see the website; <http://www.estro-events.org/ESTROevents/Pages/2eiof2013.aspx>

RRS Resources

SIT Group Link: <http://www.radres.org/forums/>

Podcast Page: <http://www.radiationresearchsociety.org/archives/category/monthly-issues>

Postdoctoral Fellowship Opportunities

Many different fellowships are being offered at the following websites. Check them out often!

<http://www.kumc.edu/rrsnews/JobMart.htm>

<http://dceg.cancer.gov/fellowship-training/research-training-opportunities/reb-training-opportunities>

Career Forum

Visit these links for job search opportunities and career information:

<http://postdocjobs.com/>

<http://www.nationalpostdoc.org/>

<http://www.nature.com/> (click on “job search” then “career magazine”)

<http://www.sciencemag.org/> (click on “Find a new job” under “careers”)

SIT Contact Details

SIT Committee: sit.radres@gmail.com

Elizabeth Moore (Chair): elmoore2@wakehealth.edu

Karl Butterworth, PhD (Vice-Chair): k.butterworth@qub.ac.uk

Corey Theriot, PhD: corey.theriot@nasa.gov

Cheng Zhou : c.zhou@dkfz-heidelberg.de

Iris Eke, MD : Iris.Eke@Oncoray.de

Paul Black, PhD : Paul_Black@urmc.rochester.edu

Kathrine Røe, PhD Kathrine.Roe@rr-research.no

Ahmed Salem, MD: alwikah@hotmail.com