

**Radiation Research Society
Scholars In Training (SIT)
Newsletter – December 2012, Issue 124**

Happy New Year from the SIT committee!



RRS MEETING SITE

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



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.org

Interesting Articles

Quantification of intra-tumour cell proliferation heterogeneity using imaging descriptors of ^{18}F fluorothymidine-positron emission tomography

J M Y Willaime *et al* 2013 *Phys. Med. Biol.* 58 187

Abstract

Intra-tumour heterogeneity is a characteristic shared by all cancers. We explored the use of texture variables derived from images of [^{18}F]fluorothymidine-positron emission tomography (FLT-PET), thus notionally assessing the heterogeneity of proliferation in individual tumours. Our aims were to study the range of textural feature values across tissue types, verify the repeatability of these image descriptors and further, to explore associations with clinical response to chemotherapy in breast cancer patients. The repeatability of 28 textural descriptors was assessed in patients who had two FLT-PET scans prior to therapy using relative differences and the intra-class correlation coefficient (ICC). We tested associations between features at baseline and clinical response measured in 11 patients after three cycles of chemotherapy, and explored changes in FLT-PET at one week after the start of therapy. A subset of eight features was characterized by low variations at baseline ($<\pm 30\%$) and high repeatability ($0.7 \leq \text{ICC} \leq 1$). The intensity distribution profile suggested fewer highly proliferating cells in lesions of non-responders compared to responders at baseline. A true increase in *CV* and *homogeneity* was measured in four out of six responders one week after the start of therapy. A number of textural features derived from FLT-PET are altered following chemotherapy in breast cancer, and should be evaluated in larger clinical trials for clinical relevance.

Space-relevant radiation modifies cytokine profiles, signaling proteins and Foxp3+ T cells

Daila S. Gridley, Asma Rizvi, Adeola Y. Makinde, Xian Luo-Owen, Xiao Wen Mao, Jian Tian, Jason M. Slater, and Michael J. Pecaut

Abstract

Purpose: The major goal was to evaluate effects of various radiation regimens on leukocyte populations relatively long-term after whole-body irradiation.

Materials and methods: C57BL/6 mice were exposed to-low-dose/low-dose rate (LDR) ^{57}Co γ -rays (0.01 Gy, 0.03 cGy/h), with and without acute 2 Gy proton (1 Gy/min) or γ -ray (0.9 Gy/min) irradiation; analyses were done on days 21 and 56 post-exposure.

Results: Numerous radiation-induced changes were noted at one or both time points. Among the most striking differences ($P < 0.05$) were: (i) High percentage of CD4+CD25+Foxp3+ T cells in spleens from the Proton vs. LDR, Gamma and LDR + Proton groups (day 56); (ii) high interleukin-2 (IL-2) in spleen supernatants from the LDR and LDR + Proton groups vs. 0 Gy (day 56), whereas IL-10 was high in the LDR + Gamma group vs. 0 Gy (day 56); (iii) difference in transforming growth factor- β 1 (TGF- β 1) in spleen supernatants from Proton and LDR + Proton groups vs. Gamma and LDR + Gamma groups (both days); (iv) low TGF- β 1 in blood from LDR + Proton vs. LDR + Gamma group (day 21); and (v) high level of activated cJun N-terminal kinase (JNK) in CD4+ T cells from LDR + Proton vs. LDR + Gamma group (day 21).

Conclusions: The findings demonstrate that at least some immune responses to acute 2 Gy radiation were dependent on radiation quality time of assessment, and pre-exposure to LDR γ -rays.

Sex-dependent Differences in Intestinal Tumorigenesis Induced in Apc1638N/+ Mice by Exposure to γ Rays

Daniela Trani, Bo-Hyun Moon, Bhaskar Kallakury, Dan P. Hartmann, Kamal Datta, Albert J. Fornace Jr.,

International Journal of Radiation Oncology Biology Physics

Volume 85, Issue 1 , Pages 223-229, 1 January 2013

Abstract

Purpose: The purpose of the present study was to assess the effect of 1 and 5 Gy

radiation doses and to investigate the interplay of gender and radiation with regard to intestinal tumorigenesis in an adenomatous polyposis coli (APC) mutant mouse model.

Methods and Materials: Apc1638N/+ female and male mice were exposed whole body to either 1 Gy or 5 Gy of γ rays and euthanized when most of the treated mice became moribund. Small and large intestines were processed to determine tumor burden, distribution, and grade. Expression of proliferation marker Ki-67 and estrogen receptor (ER)- α were also assessed by immunohistochemistry.

Results: We observed that, with both 1 Gy and 5 Gy of γ rays, females displayed reduced susceptibility to radiation-induced intestinal tumorigenesis compared with males. As for radiation effect on small intestinal tumor progression, although no substantial differences were found in the relative frequency and degree of dysplasia of adenomas in irradiated animals compared with controls, invasive carcinomas were found in 1-Gy- and 5-Gy-irradiated animals. Radiation exposure was also shown to induce an increase in protein levels of proliferation marker Ki-67 and sex-hormone receptor ER- α in both non tumor mucosa and intestinal tumors from irradiated male mice.

Conclusions: We observed important sex-dependent differences in susceptibility to radiation-induced intestinal tumorigenesis in Apc1638N/+ mutants. Furthermore, our data provide evidence that exposure to radiation doses as low as 1 Gy can induce a significant increase in intestinal tumor multiplicity as well as enhance tumor progression in vivo.

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

Late registration deadline: February 15th 2013



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

CARS 2013, June 26-29, 2013, Heidelberg Convention Center, Germany

The CARS congress is the yearly event for a renowned international community of scientists, engineers and physicians to present and discuss the key innovations that shape modern medicine on a worldwide basis.

Founded in 1985, CARS has played a leading role in medical and imaging informatics for more than 25 years by focusing on research and development on novel algorithms and systems and their applications in radiology and surgery. Its growth and impact is due to CARS's close collaboration with the ISCAS, EuroPACS, CAR, CAD and CMI societies.

Following the long term successful cooperation, in many parts of the world, in 2013 these prestigious scientific communities will jointly hold their annual meetings as part of the 27th CARS Congress in Heidelberg, Germany.

The CARS Congress Organizing Committee invites you to come to Heidelberg in June 2013, for an extraordinary event in which scientific/medical presentations as well as stimulating discussions will foster new visions on the future of medicine.

At CARS you will have the opportunity to meet scholars and practising experts in the

fields of radiology, surgery, engineering, informatics and healthcare management who have an interest in topics, such as

image- and model-guided interventions

advanced medical imaging

image processing and visualization

computer aided diagnosis

medical simulation and eLearning

surgical navigation and robotics

model-guided medicine and personalised medicine

New PACS applications, including IT-infrastructures adapted for the operating room, related results from the DICOM and IHE working groups, but in particular, new methods and IT-tools for modelling the patient and medical processes are increasingly shaping the scope of CARS. Clinical specialties represented at CARS include:

Imaging and Interventional Radiology

Cardiovascular and Oncologic Imaging and Interventions

Computed Maxillofacial Imaging

Computer Assisted Radiation Therapy

Computer Assisted Orthopaedic and Spinal Surgery

Computer Assisted Head and Neck, and ENT Surgery

Image Guided Neurosurgery

Minimally Invasive Cardiovascular and Thoracoabdominal Surgery

Please note that the deadline for paper and abstract submissions for CARS 2013 in Heidelberg is January 10, 2013.

RRS Resources

[SIT Discussion board](#)

[SIT Facebook page](#)

[RRS Podcast](#)

[RRS BR- IDGE](#)

[program](#)

Funding Opportunities

DAAD : The German Academic Exchange Service

The German Academic Exchange Service (DAAD) is the largest funding organisation in the world supporting the international exchange of students and scholars. Since it was founded in 1925, more than 1.5 million scholars in Germany and abroad have received DAAD funding. It is a registered association and its members are German institutions of higher education and student bodies. Its activities go far beyond simply awarding grants and scholarships. The DAAD supports the internationalisation of German universities, promotes German studies and the German language abroad, assists developing countries in establishing effective universities and advises decision makers on matters of cultural, education and development policy.

<http://www.daad.de/deutschland/stipendium/datenbank/en/12359-finding-scholarships/>

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/reb/fellowships/generalinformation>

Career Forum

Visit these links for job search opportunities and career information:

www.radres.org/jobs.htm, www.postdocjobs.com

www.nationalpostdoc.org/site/c.eoJMIWOBIRH/b.1464039/

www.nature.com (click on “job search” then “career magazine”)

www.sciencemag.org (click on “Find a new job” under “careers”)

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