Registration for RRS 2013 in New Orleans NOW OPEN!

4/5/2013 to 9/6/2013

http://www.radres.org/?page=59thAnnualMeeting

Tentative SIT Workshop Schedule RRS 2013 (9/14/2013)

Theme: Low Dose

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

9:00 am – 9:55 am: John Boice, Vanderbilt University School of Medicine – 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

Getting your career jumpstarted as a young investigator

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

*Jeff Willey*, Wake Forest School of Medicine

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!
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
Hypoxic Tumor Kinase Signaling Mediated by STAT5A in Development of Castration-Resistant Prostate Cancer

Kathrine Røe, Åse Bratland, Ljiljana Vlatkovic, Harald Bull Ragnum, Marie Grøn Saelen, Dag Rune Olsen, Laure Marignol, Anne Hansen Ree. Hypoxic Tumor Kinase Signaling Mediated by STAT5A in Development of Castration-Resistant Prostate Cancer. PLoS ONE 8(5): e63723. doi:10.1371/journal.pone.0063723

Abstract

In this study, we hypothesized that androgen-deprivation therapy (ADT) in prostate cancer, although initially efficient, induces changes in the tumor kinome, which subsequently promote development of castration-resistant (CR) disease. Recognizing the correlation between tumor hypoxia and poor prognosis in prostate cancer, we further hypothesized that such changes might be influenced by hypoxia. Microarrays with 144 kinase peptide substrates were applied to analyze CWR22 prostate carcinoma xenograft samples from ADT-naïve, androgen-deprived (AD), long-term AD (ADL), and CR disease stages. The impact of hypoxia was assessed by matching the xenograft kinase activity profiles with those acquired from hypoxic and normoxic prostate carcinoma cell cultures, whereas the clinical relevance was evaluated by analyzing prostatectomy tumor samples from patients with locally advanced disease, either in ADT-naïve or early CR disease stages. By using this novel peptide substrate microarray method we revealed high kinase activity mediated by signal transducer and activator of transcription 5A (STAT5A) in CR prostate cancer. Additionally, we uncovered high STAT5A kinase activity already in regressing ADL xenografts, before renewed CR growth was evidenced. Finally, since increased STAT5A kinase activity also was detected after exposing prostate carcinoma cells to hypoxia, we propose long-term ADT to induce tumor hypoxia and stimulate STAT5A kinase activity, subsequently leading to renewed CR tumor growth. Hence, the study detected STAT5A as a candidate to be further investigated for its potential as marker of advanced prostate cancer and as possible therapeutic target protein.
Geometric control of vascular networks to enhance engineered tissue integration and function

Jan D. Baranski, Ritika R. Chaturvedi, Kelly R. Stevensb, Jeroen Eyckmansa, Brian Carvalhob, Ricardo D. Solorzanaoa, Michael T. Yang,a Jordan S. Millera, Sangeeta N. Bhatia, and Christopher S. Chen

Proc Natl Acad Sci USA. 2013 May 7.

Department of Bioengineering, School of Engineering and Applied Science, University of Pennsylvania, Philadelphia, PA 19104

Tissue vascularization and integration with host circulation remains a key barrier to the translation of engineered tissues into clinically relevant therapies. Here, we used a microtissue molding approach to demonstrate that constructs containing highly aligned “cords” of endothelial cells triggered the formation of new capillaries along the length of the patterned cords. These vessels became perfused with host blood as early as 3d post implantation and became progressively more mature through 28d. Immunohistochemical analysis showed that the neovessels were composed of human and mouse endothelial cells and exhibited a mature phenotype, as indicated by the presence of alpha-smooth muscle actin–positive pericytes. Implantation of cords with a prescribed geometry demonstrated that they provided a template that defined the neovascular architecture in vivo. To explore the utility of this geometric control, we implanted primary rat and human hepatocyte constructs containing randomly organized endothelial networks vs. ordered cords. We found substantially enhanced hepatic survival and function in the constructs containing ordered cords following transplantation in mice. These findings demonstrate the importance of multicellular architecture in tissue integration and function, and our approach provides a unique strategy to engineer vascular architecture.
Risk of Ischemic Heart Disease in Women after Radiotherapy for Breast Cancer

Sarah C. Darby, Ph.D., Marianne Ewertz, D.M.Sc., Paul McGale, Ph.D., Anna M. Bennet, Ph.D., Ulla Blom-Goldman, M.D., Dorthe Brønnum, R.N., Candace Correa, M.D., David Cutter, F.R.C.R., Giovanna Gagliardi, Ph.D., Bruna Gigante, Ph.D., Maj-Britt Jensen, M.Sc., Andrew Nisbet, Ph.D., Richard Peto, F.R.S., Kazem Rahimi, D.M., Carolyn Taylor, D.Phil., and Per Hall, Ph.D.

N Engl J Med 2013; 368:987-998. March 14, 2013

Clinical Trial Service Unit and the George Centre for Healthcare Innovation, University of Oxford, Oxford, OX3 7LF, UK

Background
Radiotherapy for breast cancer often involves some incidental exposure of the heart to ionizing radiation. The effect of this exposure on the subsequent risk of ischemic heart disease is uncertain.

Methods
We conducted a population-based case–control study of major coronary events (i.e., myocardial infarction, coronary revascularization, or death from ischemic Heart disease) in 2168 women who underwent radiotherapy for breast cancer between 1958 and 2001 in Sweden and Denmark; the study included 963 women with major coronary events and 1205 controls. Individual patient information was obtained from hospital records. For each woman, the mean radiation doses to the whole heart and to the left anterior descending coronary artery were estimated from her radiotherapy chart.

Results
The overall average of the mean doses to the whole heart was 4.9 Gy (range, 0.03 to 27.72). Rates of major coronary events increased linearly with the mean dose to the heart by 7.4% per gray (95% confidence interval, 2.9 to 14.5; P<0.001), with no apparent threshold. The increase started within the first 5 years after radiotherapy and continued into the third decade after radiotherapy. The proportional increase in the rate of major coronary events per gray was similar in women with and women without cardiac risk factors at the time of radiotherapy.

Conclusions
Exposure of the heart to ionizing radiation during radiotherapy for breast cancer increases the subsequent rate of ischemic heart disease. The increase is proportional to the mean dose to the heart, begins within a few years after exposure, and continues for at least 20 years. Women with preexisting cardiac risk factors have greater absolute increases in risk from radiotherapy than other women.
The retinoblastoma protein induces apoptosis directly at the mitochondria

Keren I. Hilgendorf, Elizaveta S. Leshchiner, Simona Nedelcu, Mindy A. Maynard, Eliezer Calo, Alessandra Ianari, Loren D. Walensky, and Jacqueline A. Lees

Genes & Dev. 27 (9): 1003-1015.

Koch Institute for Integrative Cancer Research at MIT, Massachusetts Institute of Technology, Cambridge, Massachusetts 02139, USA

The retinoblastoma protein gene RB-1 is mutated in one-third of human tumors. Its protein product, pRB (retinoblastoma protein), functions as a transcriptional coregulator in many fundamental cellular processes. Here, we report a nonnuclear role for pRB in apoptosis induction via pRB's direct participation in mitochondrial apoptosis. We uncovered this activity by finding that pRB potentiated TNFα-induced apoptosis even when translation was blocked. This proapoptotic function was highly BAX-dependent, suggesting a role in mitochondrial apoptosis, and accordingly, a fraction of endogenous pRB constitutively associated with mitochondria. Remarkably, we found that recombinant pRB was sufficient to trigger the BAX-dependent permeabilization of mitochondria or liposomes in vitro. Moreover, pRB interacted with BAX in vivo and could directly bind and conformationally activate BAX in vitro. Finally, by targeting pRB specifically to mitochondria, we generated a mutant that lacked pRB's classic nuclear roles. This mito-tagged pRB retained the ability to promote apoptosis in response to TNFα and also additional apoptotic stimuli. Most importantly, induced expression of mito-tagged pRB in Rb−/−;p53−/− tumors was sufficient to block further tumor development. Together, these data establish a nontranscriptional role for pRB in direct activation of BAX and mitochondrial apoptosis in response to diverse stimuli, which is profoundly tumor-suppressive.

Clinically Relevant Modeling of Tumor Growth and Treatment Response

Thomas E. Yankeelov, Nkiruka Atuegwu, David Hormuth, Jared A. Weis, Stephanie L. Barnes, Michael I. Miga, Erin C. Rericha, Vito Quaranta

Sci Transl Med 29 May 2013.

Institute of Imaging Science, Vanderbilt University, Nashville, TN 37212
Current mathematical models of tumor growth are limited in their clinical application because they require input data that are nearly impossible to obtain with sufficient spatial resolution in patients even at a single time point—for example, extent of vascularization, immune infiltrate, ratio of tumor-to-normal cells, or extracellular matrix status. Here we propose the use of emerging, quantitative tumor imaging methods to initialize a new generation of predictive models. In the near future, these models could be able to forecast clinical outputs, such as overall response to treatment and time to progression, which will provide opportunities for guided intervention and improved patient care.
The 52nd Annual Conference of the Particle Therapy Co-Operative Group (PTCOG 52) will take place at the Congress Center in Essen, Germany, 2–8 June 2013 and will be hosted by the West German Proton Therapy Centre Essen. We are anticipating approximately 800 international scientists, a conglomerate which will offer the opportunity to network and to share technical and clinical news on particle therapy. The Educational Workshop will provide an overview of the clinical, physical, and biological basics of particle therapy with particular consideration to new advances, innovations, and prospective developments. For the Scientific Meeting we have identified some topics of major interest: image guidance, treatment planning, moving targets, proton beam therapy in children, and evidence-based particle therapy.

http://www.ptcog52.org/index.php?id=13

Particle radiosurgery: A new frontier of physics in medicine (8/25/2013-8/29/2013)
Radiotherapy treatment with high-energy charged particles is today used in several centers around the world for treatment of different types of solid cancers. Currently, most treatments are performed in a fractionated treatment scheme using protons. Future research strategies aiming at image-guided, hypofractionated treatment schedules toward real radiosurgery approaches will be discussed. Among them are novel treatment techniques based on high beam energies that allow penetration of the patient to exploit online target imaging and extensions to other non-cancer diseases and targets. The program will cover medical, physical, technical and radiobiological research as well as a discussion about the socioeconomic issues.

Abstract submission deadline: 15 May 2013
Early registration deadline: 15 May 2013
Standard registration deadline: 25 Aug 2013
Conference date: 25-29 Aug 2013

http://www.particle-radiosurgery.at/

11th Acta Oncologica Symposium: Biology-Guided Adaptive Radiotherapy (6/11/2013-6/13/2013)

Key topics for the conference will include:

- Biology of tumours and normal tissue to guide patient selection, target volumes and dose prescription in radiotherapy and particle therapy
- Functional imaging of tumours and normal tissues with functional imaging techniques based on MRI and PET, and the use of such images for dose painting and normal tissue avoidance in radiotherapy and particle therapy
- Treatment planning and delivery challenges in adaptation of radiotherapy and particle therapy based on changes in tumour and normal tissue biology, anatomy and/or function
Clinical outcome of adaptive radiotherapy and particle therapy

The target group of the meeting include physicians, physicists, radiobiologists and other scientists with an active interest in the area. The format will include invited presentations, proffered papers and discussion rounds.

Further details are available at www.bigart2013.dk.

40th Annual Meeting of the European Radiation Research Society in Dublin (9/1/2013-9/5/2013)

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!

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

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

http://www.err2013.ie/

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ASTRO 55th Annual Meeting in Atlanta  (9/22/2013-9/25/2013)

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-Events/2013-Annual-Meeting/Index.aspx

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## RRS Resources

| SIT Discussion board | SIT Facebook page | RRS Podcast | RRS BR-IDGE program |
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## 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://www.kumc.edu/rrsnews/JobMart.htm)
- [http://dceg.cancer.gov/reb/fellowships/generalinformation](http://dceg.cancer.gov/reb/fellowships/generalinformation)

## Career Forum

Visit these links for job search opportunities and career information:

- [www.radres.org/jobs.htm](http://www.radres.org/jobs.htm)
- [www.postdocjobs.com](http://www.postdocjobs.com)
- [www.nationalpostdoc.org/site/c.eoJMIWOBlrH/b.1464039/](http://www.nationalpostdoc.org/site/c.eoJMIWOBlrH/b.1464039/)
- [www.nature.com](http://www.nature.com) (click on “job search” then “career magazine”)
- [www.sciencemag.org](http://www.sciencemag.org) (click on “Find a new job” under “careers”)

## SIT Contact Details

**SIT Committee:** [sit.radres@gmail.com](mailto:sit.radres@gmail.com)

- Elizabeth Moore (Chair): [elmoore2@wakehealth.edu](mailto:elmoore2@wakehealth.edu)
- Karl Butterworth, PhD (Vice-Chair): [k.butterworth@qub.ac.uk](mailto:k.butterworth@qub.ac.uk)
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