HelmholtzZentrum münchen
German Research Center for Environmental Health

Department of Radiation Sciences

DRS NEWS 2

Welcome

The editorial team welcomes our readers to the second edition of the newsletter of the Department of Radiation Sciences at the Helmholtz Zentrum München. The first edition is available online at http://www.helmholtz-muenchen.de/drs/

Mike Atkinson (ISB) Maria Zankl (AMSD)

Julia Hess (ZYTO) Heinz Müller (ISS)

Honours and Awards

Friederike Eckardt-Schupp, ISB Director emeritus, has received the "Ulrich-Hagen-Prize" lifetime achievement award of the German Society for Radiation Biology (GBS). **Ramesh Yentrapalli** received a young investigator award at the annual meeting of the European Radiation Research Society. At the same meeting **Natasa Anastasov** and **Ines Höfig** received a poster award.

The Research School of Radiation Sciences

RS2 Research School of Radiation Science HELENA Helmholtz Graduate School Environmental Health

We celebrate the doctoral successes of **Arundathi Shriharshan** (LMU), **Ramesh Yentrapalli** (Stockholm University) and **Olena Klymenko** (TUM). We are proud to note that Dr. med Olena Klymenko is the first of our students to complete the MD / PhD programme of the Technical University of Munich.

RS2 was an official sponsor of the 2014 Munich Interact symposium for young scientists.

For more information please visit the school website: http://www.helmholtz-muenchen.de/rs2 .

The Clinical Cooperation Group "Personalized Radiotherapy in Head and Neck Cancer"

A new translational research initiative has been established in a partnership with the Ludwig-Maximillians University Munich. This Clinical Cooperation Group (CCG) "Personalized Radiotherapy in Head and Neck Cancer" (Head: **Anna Friedl**) will extend on the existing collaboration between the HMGU Research Unit of Radiation Cytogenetics (Head: **Horst Zitzelsberger**) and the Department of Radiation Oncology of the LMU University Hospital (Director: **Claus Belka**). Their mission is to develop personalized treatment strategies for head and neck cancer patients.

Head and neck squamous cell carcinoma (HNSCC) is the 6th most frequent tumour entity worldwide. The unfavourable survival rate (approx. 45%) in advanced HNSCC is largely due to resistance to radiation therapy, either alone or in combination with chemo-/immunotherapy. The CCG aims to understand the molecular mechanisms for failure of the radiation response in HNSCC. The team will integrate multi-level omics and clinical data to gain the necessary mechanistic understanding of the therapy response. This in turn is expected to lead to the discovery of biological markers that can predict the outcome of radiation therapy, allowing the development of personalized therapy concepts. One of the first activities of the team will be to build on previous work from the Research Unit of Radiation Cytogenetics that identified chromosomal alterations in HNSCC that associate with poor survival in patients treated exclusively with radiotherapy. The resulting chromosomal markers, on 16q24.3 and 1q43, as well as the overexpressed FancA gene, will be the first to be examined in clinical studies that will compare outcome of cancer treatment with these marker genes in HNSCC tissue samples from retrospective and prospective tumour cohorts. For more detailed information please visit the CCG web site at:
http://www.helmholtz-muenchen.de/en/research/research-institutions/clinical-cooperation-groups/personalized-radiotherapy-in-head-and-neck-cancer/research/index.html

Appointments

Horst Zitzelsberger has been appointed as the managing editor of the journal Radiation Oncology. **Christoph Hoeschen** has been appointed associate editor of the Journal of Medical Imaging. **Peter Jacob** chairs the task group "*Health implications for workers and the public*" of the UNSCEAR project "*Levels and Effects of Radiation Exposure Due to the Nuclear Accident After the 2011 Great East-Japan Earthquake and Tsunami*".

Recent DRS Publications

A novel imaging system for computer tomography using non-radioactive high-Z tracers.
X-ray absorption imaging and CT are the most widely employed clinical diagnostic tools today. Although standard X-ray CT does not provide functional information, recent advances in the imaging of high-Z elements have spurred interest in molecular CT, for example the use of gold nanoparticles coupled to antibodies to target particular tumour types. The most dose-efficient means of detecting high-Z elements is by imaging their X-ray fluorescence. Visualizing the low tracer concentrations relevant to molecular imaging in humans, however, is hindered by large background signals and the need for a large-area detector with high energy resolution. In this publication a novel imaging scheme is proposed to overcome these problems. **Müller, B.H. et al.** (2013): Molecular imaging based on x-ray fluorescent high-Z tracers. *Phys. Med. Biol. 58:8063.*

Markers of the radiation therapy response identified in the blood plasma of cancer patients
Predictive markers of individual therapy response are required to improve individualized cancer treatment strategies. We identified microRNAs circulating in the blood plasma of head and neck cancer patients that indicated an early response to radiochemotherapy. A cell culture model simulating radiochemotherapy implies that the changes in circulating microRNAs directly reflect the tumor response to treatment. Further studies will clarify the prognostic value of these plasma microRNAs as a minimally invasive tool to monitor and adapt individual treatment. **Summerer et al.** (2013): Changes in circulating microRNAs after radiochemotherapy in head and neck cancer patients. *Radiat. Oncol. 2013 Dec 28; doi: 10.1186/1748-717X-8-296*.

Other recent publications of note:
Kraemer A. et al. Cell survival following radiation exposure requires miR525-3p mediated suppression of ARRB1 and TXN1. *PLoS One 8(10):e77484 (2013).*
Azimzadeh O. et al. PPAR alpha: a novel radiation target in locally exposed Mus musculus heart revealed by quantitative proteomics *J. Proteome Res*. *12(6):2700-14 (2013)*.
Jacob P. et al. Ultrasonography survey and thyroid cancer in the Fukushima Prefecture *Radiat. Environ. Biophys. doi: 10.1007/s00411-013-0508-3 (2014).*

Personalia

We congratulate **Julia Hess** on her appointment as head of the radiation sensitivity group (Research Unit Radiation Cytogenetics).

We wish our colleagues **Stephan Thalhammer** and **Mandy Birschwilks** every success as they leave the DRS to take up new challenges.

The DRS welcomes **Xie Wenzhang** from Tsinghua University, Beijing. She will study Monte Carlo simulation of radiation damage in radiation therapy using gold nanoparticles.

We welcome **Corinna Loes** as the new coordinator at PPM of our Research School of Radiation Sciences.

Recent funding

ASMD has received funding from the HMGU Diabetes Portfolio to develop new in vivo imaging techniques for diabetes research. **Michael Rosemann** has received a grant from the EU to study radiation effects on mesenchymal stem cells.

Events for your Diary

April
5th EpiRadBio Contractors Meeting, Lisbon, 28–29 April 2014 http://www.epiradbio.eu/

May
2nd EURADOS School on Voxel phantom development and implementation in radiation physics, Neuherberg, Germany, 13-15 May 2014
http://www.eurados.org/en/News/WG6VoxelPhantom_2nd

July
The DRS hosts the annual research meeting of the EU network of Excellence DoReMi from 7-10 July.
http://www.doremi-noe.net/

August
WE-Heraeus Physics School on “Ionizing Radiation and Protection of Man”, Bad Honnef, 10-22 August 2014
http://www.helmholtz-muenchen.de/kurse/heraeus-school

September
Conference on Radiation and Health, Las Vegas, 21-24 September 2014 http://www.radres.org/CRH

Legal notice / Editor

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