



Newsletter 4

October 16, 2014

Forschungskolloquium KFSP Tumor Oxygenation



Prof. Dr. Willem H. Koppenol on “Warburg, Cancer and Radiation” in our monthly Forschungskolloquium Tumor Oxygenation.



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KFSP Tumor Oxygenation

Mission

One of our population's main health threats is cancer (25.7% of deaths in Switzerland in 2012). Four out of ten people in Switzerland will contract cancer during their lifetime, with increasing incidence, leading to personal distress and a substantial and rapidly increasing proportion of the healthcare spending. And we still have no sufficient cures.

Today, we know that for cancer diagnosis and treatment, oxygen is one of the most important prognostic biomarkers (i.e. low oxygenation is strongly associated with unfavorable outcomes) and therapeutic targets (i.e. oxygenation highly affects the effectiveness of therapies and therefore the target is to increase tumor oxygenation). So far, the accurate measurement of tumor oxygenation in a non-invasive, non-toxic, yet repetitive manner has not been possible.

The aim of the KFSP Tumor Oxygenation is to provide novel methods of bio photonics, such as 3D near-infrared imaging technologies and fluorescence molecular tomography, BOLD magnetic resonance imaging (MRI) and positron emission tomography (PET) to image and measure tumor oxygena-

tion and oxygen metabolism in vivo at the animal and human level. Our research focuses on head and neck cancers and might be extended to other important tumor entities at a later stage. The oxygenation of these cancers will be studied before and during surgery, radiotherapy and chemotherapy as well as photodynamic therapy and, ultimately, the therapy will be optimized by being able to predict treatment response before and during therapy. By striving for multidisciplinary medical research, we aim for a personalized approach of cancer treatment that limits harmful side-effects and at the same time provides more effective treatment. Specifically, the KFSP Tumor Oxygenation will provide the tools to better understand, possibly prevent and more effectively treat cancer, thereby reducing social cost and personal distress and increasing the quality of life of cancer patients.



Spotlight

On August 21, 2014 the KFSP Tumor Oxygenation summer barbecue took place at the University Hospital's park in bright sunshine. After two progress reports by our project members within our monthly seminar, all researchers together enjoyed delicious catering while discussing the speeches and everyone's research progress.

Seminar

Forschungskolloquium KFSP Tumor Oxygenation

On May 15, 2014 Rafael Nagler MD, DMD, PhD from Rambam Medical Center in Haifa, Israel gave a speech on "The use of tumor markers for diagnosis and follow up of head and neck cancer patients".

On August 21, 2014 Jesus Glaus Garzon from the University of Zurich presented a progress report on "Tumor oxygenation, inflammation and metastasis (preclinic)". His colleague Catherine Germanier from the ETH Zurich presented a progress report on "Imaging tumor hallmarks: hypoxia signaling and angiogenesis (preclinic)".

On September 18, 2014 Dr. Salvador Sanchez Majos from the University Hospital Zurich

presented a progress report on "Time resolved near infrared imaging system (methods)". Dr. Sonja Stieb from the University Hospital Zurich presented a progress report on "Tumor oxygenation and radiation resistance (clinical)".

On October 16, 2014 Prof. Dr. Willem H. Koppenol from the Laboratory of Inorganic Chemistry at the ETH Zurich gave a speech on "Warburg, cancer and radiation".

After the seminar, we enjoyed stand-up pizza on site of the lecture hall. Thus, participants stayed and lively discussions took place about the speeches and the respective teams' research progress.

Special lectures in the framework of the KFSP

We encouraged all researchers involved in the KFSP Tumor Oxygenation to take part in the seminars of the Cancer Network Zurich, available at www.cnz.uzh.ch/Seminars.html.

Publications

Papers

Papers that have been published in the framework of the KFSP Tumor Oxygenation so far:

Pavia J., Wolf M., Charbon E. (in press), *Single-photon Avalanche Diode Images Applied to Near-infrared Imaging*, IEEE Journal of Selected Topics in Quantum Electronics, in press.

Pavia J., Wolf M., Charbon E. (2014), *Measurement and Modeling of Microlenses Fabricated on Single-photon Avalanche Diode Arrays for Fill Factor Recovery*, Opt. Express, 2014, 22:4202-4213.

Helbig L., Koi L., Brüchner K., Gurtner K., Hess-Stumpp H., Unterschemmann K., Pruschy M., Baumann M., Yaromina A., Zips D. (2014), *Hypoxia-inducible Factor Pathway Inhibition Resolves Tumor Hypoxia and Improves Local Tumor Control after Single-dose Irradiation*, Int J Radiat Oncol Biol Phys., 2014, 88:159-66.

Orlowski K., Rohrer Bley C., Zimmermann M., Vuong V., Hug D., et al. (2012), *Dynamics of Tumor Hypoxia in Response to Patupilone and Ionizing Radiation*, PLoS ONE 7(12): e51476.

doi:10.1371/journal.pone.0051476.

Further publications by members of the KFSP Tumor Oxygenation have been submitted. Yet further publications are in the process of being issued and planned to be submitted for publication in 2014/2015.



We would like to remind all researchers to mention the KFSP Tumor Oxygenation in the acknowledgement or affiliation of their papers, abstracts, newspaper articles, conference presentations and public speeches in the following form: "This work was supported by the KFSP Tumor Oxygenation of the University of Zurich". Please keep in mind to use the American spelling "tumor" (instead of "tumour").

People

Team Members Who Have Left



Due to finishing her PhD studies, Kamila Bartnicka has left the research team of Prof. Dr. Roland H. Wenger at the Institute of Physiology (UZH) as per end of August 2014. We congratulate and wish her all the best.

New Team Members



Since June 2014, Dr. Desirée Schumann is employed as a post doc by the clinical research group of Marius Bredell BChD MBChB MChD at the Clinic of Cranio-maxillofacial and Oral Surgery (USZ). Prior to joining the KFSP Tumor Oxygenation Dr. Desirée Schumann received her PhD in Molecular Biology from the University Hospital Zurich in 2006. Afterwards, she worked as a post doc and scientist at institutions such as the University of Chicago and Boehringer Ingelheim before she founded her own business "Dr Schumann Scientific Solutions" in 2013. As CEO of this company, she monitors clinical trials and writes clinical trial protocols. Welcome to the team!



Since July 2014, Dr. Barbara Apel is employed as a research associate by the clinical research group of Dr. Kristian

Ikenberg at the Institute of Clinical Pathology (USZ). Prior to joining the KFSP Tumor Oxygenation she passed her medical state examination at the Humboldt University of Berlin in 2009. Afterwards Dr. Barbara Apel worked as assistant doctor pathology at the Carl-Thiem Clinical Center in Cottbus, Germany (2009-2012) and at the Kantonsspital Luzern (2013). Welcome to the team!



Since August 2014, Marta Nesteruk is employed as a PhD student by the clinical research group of PD Dr. Oliver Riesterer at the Clinic of Radiation Oncology (USZ). Prior to joining the KFSP Tumor Oxygenation and beginning her PhD studies, Marta earned her Master degree in Medical Physics from the University of Warsaw, Poland (2014). Welcome to the team!



Since August 2014, Dr. M. Asim Siddique is employed as a post doc by the clinical research



group of Marius Bredell BChD MBChB MChD at the Clinic of Cranio-maxillofacial and Oral Surgery (USZ). Prior to joining the KFSP Tumor Oxygenation, Dr. M. Asim Siddique earned his PhD in Natural Sciences at the ETH Zurich in 2006. Afterwards he worked as a research fellow and data manager at several institutions of the University Hospital Zurich, such as the Center for Experimental Rheumatology, the Department of Internal Medicine and the Department of Cardiology. Dr. M. Asim Siddique will be employed until December 2014 to replace Dr. Ilhem El-Koachairi who is on maternity leave. Welcome to the team!



Since September 2014, Dr. Sara Santambrogio is employed as a post doc by the preclinical research group of Prof. Dr. Roland H. Wenger and PD Dr. Lubor Borsig at the Institute of Physiology (UZH). Prior to joining the research team of Prof. Dr. Roland H. Wenger in 2011, Dr. Sara Santambrogio earned her Master degree in Pharmaceutical Biotechnology from the University of Milan, Italy, in 2005 and her PhD in Cellular and Molecular Biology

at the San Raffaele Telethon Institute for Gene Therapy in Milan, Italy, in 2011. Welcome to the team!

Outlook

Yearly Retreat 2014

On November 25, 2014 the KFSP Tumor Oxygenation Yearly Retreat will take place at Hotel Steigenberger Bellerive au Lac in Zurich. In addition to presenting short progress reports on accomplishments, problems, the next milestones and publications completed, intended and in preparation, the participants will discuss the organization of the evaluation in March 2015 and plans for the next potential funding period 2016-2018. Again, Prof. Dr. Urs Lütolf, former Director of the Clinic of Radiation Oncology and Medical Director of the University Hospital Zurich (USZ), will act as a scientific advisor and review the projects' progress.

Evaluation

On March 16/17 2015, all KFSPs will be evaluated by external experts who will decide on their prolongation. As a basis for their decision, each research group has to prepare a development plan 2016-2018 until November 10th, 2014 and a report of what has been ac-

complished in 2014 until December 31st, 2014.

In order to make a recommendation to the dean's office, the external experts will evaluate the projects with regards to the research quality (originality, potential for innovation), translational aspects and interconnectedness of the involved research groups, measures for junior staff development and equal opportunities for men and women, scientific events and public relations, efforts for acquiring third party funds and adequateness of the requested funding.



Newsletter 5 will appear in April, 2015.

Publishing Information

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