Dear Early Career Researchers,

Welcome to the Particle Therapy Cooperative Group Early Career Researchers (PTCOG-ECR) Subcommittee, a dedicated group representing the interests and concerns of emerging researchers and practitioners in the ever-evolving realm of particle therapy. Our mission is to foster collaboration, provide support, and address the unique needs of those navigating their early careers in particle therapy.
We are pleased to bring you the inaugural edition of our newsletter, with a curated collection of highlights and opportunities tailored to elevate your experience in the dynamic world of particle therapy. Whether you're on the lookout for exciting job prospects, eager to stay updated on upcoming events, or seeking recognition for your exceptional work, we hope that our newsletters have something special for each of you.

📅 Upcoming Events: PTCOG-ECR Workshop – “Open-Source Thinking: The Future of Data Sharing for Medical Research”

In the era of collaboration and innovation, open-source thinking is the catalyst for transformative breakthroughs in medical research. Imagine a world where data flows seamlessly, fostering collaboration, accelerating discoveries, and shaping the future of healthcare. Join us at the PTCOG 62 conference in Singapore (June 10-15, 2024) for a plenary session featuring invited speakers and a panel discussion.

📲 Join our new Slack community!

We are excited to announce the launch of our Slack platform for the PTCOG Early Career Research subcommittee! This space will serve as a dynamic hub for networking and knowledge sharing among the PTCOG ECR community.
Key features:

- Networking: connect with fellow ECRs, share your research interests, and build connections ahead of the PTCOG conference.
- Job Opportunities and Events: stay updated on job openings, conferences, workshops and other opportunities in the field.
- Stack exchange: engage in scientific discussions, ask questions, and exchange insights and advice with the ECR community.
- Subcommittee Updates: stay informed about subcommittee activity, and share your ideas for how the subcommittee can be improved.

How to join:
Current ECR members will receive an email with the link to join. For new members, this link will be provided upon sign-up. If you haven't received the link, please reach out and we'll make sure to get you connected!

⚡⚡⚡ SPOTLIGHT ON FRPT 2023 ⚡⚡⚡

👨‍🔬 Marco Battestini, PhD Student, Department of Physics, University of Trento
Several really interesting works were presented at FRPT 2023, exploring all the different aspects of FLASH radiotherapy, from the technological advancement in the field of accelerators and UHDR dosimeters, to novel important insights from in silico, in vitro and in vivo investigations on the FLASH mechanistic puzzle. I'd like to highlight three noteworthy works regarding the study of the biological mechanism underlying the FLASH effect, focusing on different levels: radiation chemistry, DNA damage and in vivo data.

- **J. P. Sunnerberg, et al. Mean dose rate in UHDR electron irradiation is a significant predictor for O2 consumption and H2O2 yield.**

This work studied the impact of dose rate on H_2O_2 and O_2 molecules, which are two very important chemical species in the context of the UHDR radiation chemistry. In particular, they showed that both the H_2O_2 yield and the O_2 consumption depend clearly on the mean dose rate and also on the instantaneous dose rate, where the mean dose rate may have the dominant effect.

- **L. Kunz, et al. DNA damages on PBR322 plasmid induced by IEE, VHEE and proton beams at ultra-high and conventional dose rate.**

This work analyzed the role of several parameters on DNA damage in the ultra-high dose rate regime, such as the oxygenation condition, the presence and concentration

of scavengers, the pH and the iron concentration. They obtained very interesting but contradictory results on plasmid DNA damage compared to the in vivo experiments: they concluded that in principle a higher sparing effect should be observed in tumors compared to healthy tissues, due to different levels of oxygen, pH and iron concentration between the two tissues, all factors leading to a larger effect on tumors.

- **B. Singers Sørenson. FLASH in vivo - what matters**

This work highlighted the most important open questions towards treatment planning in the case of proton FLASH irradiation. In particular, Dr. Sørensen analyzed the role of the dose delivery time structure for different skin toxicity levels, through different repainting schemes, and showed the impact of dose splitting in the FLASH regime with respect to the conventional irradiation, concluding that these are both crucial aspects for the quantification of the sparing effect.

Beth Rothwell, Postdoctoral Researcher, Massachusetts General Hospital
FRPT 2023 was a brilliant and lively conference showcasing new and exciting advances in FLASH radiotherapy. While the entire conference was a standout experience, my top three highlights would be:

- **E. Terpsi Vitti, et al. FLASH radiotherapy: Exploring the mechanisms in vitro in human 2D cultures and murine 3D epithelioids.**

Dr Vitti showcased a novel method for studying the FLASH mechanism, using 3D epithelioid cultures developed at the University of Cambridge. These tissue-like structures can contain both normal and cancerous cells, allowing for long-term exploration of the FLASH effect on both healthy tissue and tumours. Dr Vitti and co-authors demonstrated increased tumour control from FLASH compared to conventional radiation, as well as sparing of normal cells – an exciting leap bridging the gap between in vitro and in vivo studies.

- **J. Jansen, et al. Unveiling the power of MRI to evaluate the FLASH effect: How diffusion-tensor imaging reveals differenes between FLASH-RT and CONV-RT on whole brain irradiated mice.**

Another new technique for FLASH studies was presented by Dr Jansen, who used diffusion-tensor imaging to reveal the long-term differential impact of FLASH and conventional irradiation on brain connectivity. Using in vivo and ex vivo imaging of mice brains after whole brain irradiation, Dr Jansen and colleagues showed FLASH radiation resulted in images much more similar to control images than conventional radiation – an important insight following the improved memory-preservation from FLASH demonstrated in early studies.

- **The ballon debate**

Finally, it wouldn't be FRPT without its signature balloon debate – a lively bit of entertainment to round off the scientific sessions. This year's debate question: "The biggest advance in radiotherapy in the next 10 years will come from…?". Four speakers battled it out to defend their topic and their spot in the balloon – Constantinos Koumenis arguing for FLASH, Christian Fernandez for spatially fractionated radiotherapy, Andrew

McPartlin for combination treatments, and David Jaffray for artificial intelligence. The debate culminated in FLASH and AI going head-to-head in the final round, and resulting in an exact draw – a first in FRPT history.

☑📥 Job Opportunities and Highlights:

→ PTCOG website for more job opportunities available.
More info

→ PhD Research Fellow in Advanced Computational Methods for Treatment Verification in Proton Therapy (Bergen, Norway)
More info

→ PhD Position: "Photon counting CT in treatment planning of proton therapy" (Aarhus, Denmark)
More info

→ PhD within radiobiology for proton therapy: "Enhancing the biological benefit in vivo to improve radiotherapy" (Aarhus, Denmark)
More info

→ Two-year postdoctoral fellowship at LPSC (Grenoble, France) - "Development of a novel technique for TOF-based proton imaging"
More info

→ Dosimetrist at Emory Proton Therapy Center (Atlanta, USA)
More info

→ Postdoctoral Fellowship in AI for Radiation Therapy at University of Maryland (Baltimore, USA)
More info

→ Acting Instructor-Provisional, Proton Radiation Therapy Fellowship, Radiation Oncology at University of Washington (Seattle, USA)
More info

→ Radiation Oncologist Fellowship/Instructor at University of Alabama (Birmingham, USA)
More info

→ Post-Doctoral fellow proposal at Centre Léon Bérard (Lyon, France) - "Head and Neck radiotherapy dose painting from mpMRI-based tumor habitat maps"
More info

Do you know of any other job opportunities? Let us know**!**

Upcoming Conferences:

PTCOG 62
Location: National Cancer Center, Singapore
Time: June 10-15, 2024
Abstract submission: closed
More info

ESTRO
(European Society for Therapeutic Radiology and Oncology)
Location: Glasgow, United Kingdom
Time: May 3-7, 2024
Abstract submission: closed
More info

ICCR

(International Conference on the use of Computers in Radiation therapy)
Location: Lyon, France
Time: July 8-11, 2024
Abstract Submission: Until 4st February (extended)
More info

Radiation Research Society Annual Meeting

Location: Tucson, Arizona
Time: September 15-18, 2024
Abstract submission: TBD
More info

ASTRO

(American Society for Therapeutic Radiology and Oncology)
Location: Washington D.C. & Online
Time: September 29-October 2, 2024
Abstract submission: Until March 12, 2024
More info

AAPM

(American Association of Physicists in Medicine)
Location: Los Angeles, California
Time: July 21-25, 2024
Abstract submission: until February 27, 2024
More info

ECMP

(European Congress of Medical Physics)
Location: Munich, Germany
Time: September 11-14, 2024
Abstract submission: until March 1, 2024
More info

Do you know of any other upcoming conferences? Let us know!

SHARE YOUR IDEAS

We encourage active participation from our members. If you have ideas, suggestions, or collaboration opportunities, please share them with us using the PTCOG-ECR new ideas form. The Operative Group will review and discuss new ideas during periodic meetings, ensuring a collaborative and inclusive decision-making process.

JOIN US!

Feel free to forward this newsletter on to any of your colleagues who might be interested in joining us!!
Liked this week's issue? Don't forget to spread it out!

Welcome aboard and we look forward to working together to shape the future of particle therapy!!

Warm regards,
The PTCOG-ECR Subcommittee Operative Group
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