UNIVERSITÄT
BERN

Faculty of Medicine

Department for BioMedical Research

Benoît Pochon Prize

The Benoît Pochon Prize was established in honour of the memory of Mr. Benoît Pochon, a former PhD student in the Radio-Oncology research group of the DBMR. The prize is awarded yearly to a doctoral student of the Department for BioMedical Research in recognition of the high quality and productivity of their research work.

Benoît Pochon Prize 2024

At DBMR Day for BioMedical Research on July 2, Prof. Dr. Deborah Stroka announced the winner of the Benoît Pochon Prize 2024.

The prize went to:

Dr. Liana Hayrapetyan

Supervisor: PD Dr. Michaela Medová
Co-advisor Prof. Dr. Antoine R. Adamantidis.

Title of the PhD thesis:

"MET receptor serine 1014 phosphorylation in neurodevelopment and its relevance to autism spectrum disorder".

The DBMR congratulates Dr. Hayrapetyan!

Lay Summary:

This thesis comprises two parts:

Comprehensive characterization of a novel MET animal model. The MET receptor mediates neurodevelopmental processes and its signaling disruption is associated with prefrontal cortex (PFC)-mediated behavior. We studied the physiological roles of a previously unreported MET residue, S1014, in a newly generated knock-in (KI) mouse model lacking phosphorylation on S1014. S1014 KI mice showed reduced weight gain, cancer predisposition and behavioral abnormalities. Single nuclei RNA sequencing revealed that absence of S1014 phosphorylation leads to age-dependent alterations in synaptic signaling, potentially due to large-scale cell non-autonomous adaptations in astrocytes during synapse formation and maturation. The data emphasizes the necessity of taking a broader approach for understanding molecular adaptations beyond the cell types that express the target gene in models of neurodevelopmental disorders.

Targeting DNA damage repair in combination with ionizing radiation (IR) in head and neck squamous cell carcinoma (HNSCC). We investigated the responses of several HNSCC models with distinct human papillomavirus (HPV) and p53 status to treatments with IR, DNA-PKcs inhibitor peposertib, and their combination. IR-induced DNA damage combined with peposertib results in decreased cell viability and proliferation, and causes DNA repair delay in all studied cell lines. However, the actual cell fate is dependent on their p53/HPV status as cells lacking functional p53 signaling are eliminated by apoptosis whereas p53-proficient cells undergo senescence. Consequently, HPV+ xenografts respond better to the combined treatment than p53-proficient HNSCCs. These findings suggest that peposertib as a HNSCC radiosensitizer is potentially more beneficial for patients with p53-mutated or HPV+ tumors.

Published articles:

Hayrapetyan, L., Roth, S. M., Quintin, A., Hovhannisyan, L., Medo, M., Riedo, R., ... & Medová, M. (2024). HPV and p53 status as precision determinants of head and neck cancer response to DNA-PKcs inhibition in combination with irradiation. Molecular Cancer Therapeutics. https://doi.org/10.1158/1535-7163.MCT-23-0794

Koch, Jonas P., Selina M. Roth, Aurélie Quintin, Jacopo Gavini, Eleonora Orlando, Rahel Riedo, Chiara Pozzato, Liana Hayrapetyan, Ruedi Aebersold, Deborah M. Stroka, Daniel M. Aebersold, Matúš Medo, Yitzhak Zimmer & Michaela Medová. "A DNA-PK phosphorylation site on MET regulates its signaling interface with the DNA damage response." Oncogene 42, no. 26 (2023): 2113-2125. https://doi.org/10.1038/s41388-023-02714-6

Yenkoyan, Konstantin, Zadik Ounanian, Margarita Mirumyan, Liana Hayrapetyan, Naira Zakaryan, Raisa Sahakyan, and Geir Bjørklund. "Advances in the Treatment of Autism Spectrum Disorder: Current and Promising Strategies." Current medicinal chemistry 31, no. 12 (2024): 1485-1511. doi: 10.2174/0109298673252910230920151332