Project #17

Title: Molecular investigation of a novel therapeutic approach for breast cancer precision medicine

Description: Cancer treatment has changed tremendously over the last few decades, moving from a one-size-fits-all approach to a more tailored, personalized approach. Despite many advancements in cancer care, tumor molecular heterogeneity and drug resistance remain some of the biggest challenges faced by breast cancer patients. We recently demonstrated that targeting the highly-tumor specific protein Lactate Dehydrogenase C (LDHC) reduces the long-term viability of breast cancer cells, and moreover greatly improves the treatment response of breast cancer cells to drugs that impact the DNA damage response (DDR) pathway *(Naik et al, Mol Oncol 2021)*. Therefore, tumor expression of LDHC could help to identify patients who are the most likely to benefit from DDR-therapy, and combination treatment with LDHC-targeted therapy could improve treatment success and clinical outcome. In this project, we will further decipher the mechanistic basis of how targeting LDHC leads to the accumulation of excessive DNA damage, reduced cancer cell survival and higher sensitivity to DDR drugs. To achieve this, the student will acquire hands-on experience with multiple techniques such as mammalian cell culture, LDHC targeting and drug experiments, inhibitor studies, molecular analyses (qRT-PCR, western blotting, flow cytometry, immunofluorescence), and functional assays (viability, clonogenicity).

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