

Research profile for applicants

Name of DKFZ research division/group:	Developmental Origins of Pediatric Cancer (B430)
Contact person:	Lena Kutscher l.kutscher@kitz-heidelberg.de
Group homepage: <i>Visit this website for further information on current research and recent publications.</i>	https://www.dkfz.de/en/developmental-origins-of-pediatric-cancer

RESEARCH PROFILE AND PROJECT TOPICS

Males have an overall increased incidence of several childhood cancers relative to females. While this difference can, for some cancer types, be explained genetically by gene dosage of X-linked genes, other cellular, molecular, and non-genetic mechanisms underlying these differences are largely unknown. Recent studies from my group have indicated that the initiating events for a specific type of pediatric brain cancer, Group 3 and Group 4 medulloblastoma, occur during fetal development, suggesting that these sex-linked differences between male and female incidence rates involve factors that are already present before birth. Indeed, preliminary data from my group shows that prenatal androgen exposure increases the abundance of the specific cerebellar progenitor cells that serve as the cells-of-origin for Group 3/4 medulloblastoma.

In this project, the postdoc will disentangle the effect of sex chromosome complement and gonadal hormones in Group 3/4 medulloblastoma tumor initiation and progression, primarily using iPSC-based cerebellar organoid models. Specifically, s/he will functionally elucidate how androgen exposure and the XY genotype expands the cell-of-origin progenitor populations to promote tumor initiation, using advanced single-cell barcoding, lineage experiments, and extensive molecular biology techniques. The postdoc should have a general willingness to work with animal models, but the primary model system will be iPSC-derived cerebellar organoids and cancer cell lines.

Altogether, this project integrates developmental neurobiology and cancer genetics to uncover how hormonal exposures during fetal development shape childhood cancer risk. By establishing a direct mechanistic link between prenatal hormone exposure and sex-specific cancer vulnerability, this project will reveal the scientific basis of the male bias in medulloblastoma and open new avenues for risk prediction and therapy.



CONNECTING THE DOTS.
TO ADVANCE RESEARCH CAREERS

International Postdoc Program
www.dkfz.de/postdoc