GSI - **SEMINAR**

Im Theorieseminarraum, SB3 Raum 3.170a

Darmstadt, Planckstraße 1

Donnerstag, den 28. Januar 2016 14:00 Uhr

Prof. Dr. med. Ulrike A. Nuber
TU - Darmstadt (Biology)

"*Our lab has two major research interests: 1) Neural stem cells and brain tumors and 2) Rett syndrome and iPS cells"*

Normal cell and tumor cell states are determined by complex hierarchical gene regulatory networks with master regulators acting on top of the hierarchy. We have shown that three different types of brain tumors (gliomas, central nervous system primitive neuroectodermal tumors, and atypical teratoid/rhabdoid-like tumors) can develop from the same pool of postnatal mouse neural stem/progenitor cells and that the type and order of genetic events directs the development of these tumor types. Brain tumors develop upon overexpression of single genes or combinations thereof in p53−/− postnatal neural stem/progenitor cells. In contrast to the overexpression of HRAS or MYC, enhanced expression levels of Bmi1 or Ezh2 are not sufficient for tumor development. New findings from our laboratory demonstrate that BMI-1 positively regulates the number of proliferating cells in a postnatal neural stem cell niche, the lateral ventricle wall, and that this function is mediated by a novel direct target gene.

Rett syndrome is caused by loss-of-function mutations in the X-chromosomal gene MECP2. It is the second most frequent form of mental retardation in girls after Down syndrome with an incidence of approximately 1:10,000 female life births. The disease-causing gene codes for the MeCP2 protein, which binds to methylated DNA and modulates gene activity. We have identified glucocorticoid-regulated genes as direct targets of MeCP2 in a mouse model of Rett syndrome and have shown that manipulating the glucocorticoid stress system has an impact on symptom onset and lifespan of these animals. Since viable human brain tissue from patients is not available to study the cellular effects of MECP2 mutations and to develop novel targeted therapies for Rett syndrome, we are using human iPSC-derived neurons as an in vitro disease model.

Einladender: Prof. Dr. Gerhard Kraft

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