Project abstract

Name of DKFZ research division/group:	***Research group "RNA-Protein Complexes & Cell Proliferation" (B150)***
Contact person:	***PD Dr. Maïwen Caudron-Herger (m.caudron@dkfz-heidelberg.de, #424383)***
Group homepage: **Please visit our website for further information on our research and recent publications.**	*https://www.dkfz.de/en/rna-protein-complexes-and-cell-proliferation*

PROJECT PROPOSAL

Research Focus:

Cells have the wonderful ability to assemble a great variety of dynamic structures performing very complex and specific tasks. Our goal is to improve our understanding of the underlying regulatory mechanisms and to answer the question of how dysfunction can lead to disease, with a strong focus on RNA-protein networks.

Short project Description:

Cancer is a complex disease that involves the successive establishment of dysfunctions in multiple key cellular processes leading to characteristics hallmarks such as sustaining proliferative signaling, resisting cell death and enabling replicative immortality. Breast cancer is the most prevalent cancer in women and ovarian cancer has one of the poorest prognoses among all cancer types. Mutations in BRCA1 and BRCA2 represent major risk factors for both breast and ovarian cancer. While hereditary breast and ovarian cancer represent ~10%–20% of the disease fraction in the population, only ~10% of hereditary cases are due to mutations in BRCA1/2, suggesting additional, yet unknown risk factors to be identified.

RNA-binding proteins play important roles in the regulation of gene expression through the regulation of mRNA splicing, stability and translation, thereby affecting the development, progression and treatment response of cancer diseases. Recent advances in RNA biology have led to the identification of an increasing number of RNA-binding proteins, most of them awaiting further charaterization. RNA-binding proteins such as TIAR and TPX2 are important for cell cycle control and genomic stability, and connected to BRCA proteins. Using an interdisciplinary approach, including bioinformatic analysis of patient cohorts and tissue microarray staining, we are currently determining the potential diagnostic and prognostic value of both TIAR and TPX2. Importantly, our preliminary data suggest a potential tumor suppressor behaviour of TIAR. Here, the aim of the project will be to comprehensively characterize this cancer driver aspect of TIAR and to determine its relevance and importance in breast cancer disease progression.