Heidelberg Campus Meeting on
Regulation of the Genome and Epigenome

Date: May 14, 2018, 13:00 – 18:00
Location: ZMBH, Seminar Room Ground Floor (INF282)
Organized by the ***DKFZ-ZMBH Alliance:*** **Sylvia Erhardt** (ZMBH) and **Frank Lyko** (DKFZ)

Draft Program

13:00	**Welcome (Sylvia Erhardt)**	15:15	*Coffee Break*
13:05	**INVITED LECTURE 1:** **Maria Elena Torres-Padilla** Inst. of Epigenetics & Stem Cells, HMGU Munich **Epigenetic mechanisms in early mammalian development**	15:50	**INVITED LECTURE 2:** **Robert Schneider** Institute of Functional Epigenetics, HMGU Munich **Novel Players in Chromatin**
13:45	**Jose Paulo Lorenzo** Papavasiliou Lab, DKFZ Epigenetic roles for APOBEC2, the orphan member of the APOBEC family	16:30	**Jonas Ecker** Witt / Milde Lab, DKFZ and Heidelberg University Hospital Targeting MYC in Group 3 Medulloblastoma
14:00	**Alena Giwojna** Grummt Lab, DKFZ DNA-RNA triple helices: a Liaison between noncoding RNAs and chromatin	16:45	**Francesca Tuorto** Lyko Lab, DKFZ Nutritional control of protein translation
14:15	**Weijun Feng** Liu Lab, DKFZ Chromatin remodeling during neurodevelopment	17:00	**Sebastian Gornik** Guse Lab, COS Linking higher-order genome organization to cellular function using dinoflagellates as a model
14:30	**Pavlo Lutsik** Plass Lab, DKFZ Epigenetic characterisation of H3.3-mutant giant cell tumor of the bone	17:15	**Michael Oehler** Brunner Lab, BZH Regulation of Light-Induced Transcription in *Neurospora crassa*
14:45	**Sam Corless** Erhardt Lab, ZMBH Sorting through junk - dissecting chromatin at repetitive DNA	17:30	**Steffie Revia** Tschaharganeh Lab, DKFZ Role of Tumor Suppressor UTX in cancer development
15:00	**Jorge Trojanowki** Rippe Lab, DKFZ and BioQuant Real-time observation of light-controlled transcription in living cells	17:45	**Closing Remarks (Frank Lyko)** Followed by drinks and pizza

About the Meeting:

Through this meeting, we would like to bring together research groups in Heidelberg working in similar fields. Together with two guest speakers, postdocs and PhD students will present their most exciting current research data in short talks. Time for social interaction afterwards!

Further Information and Updates: http://www.dkfz-zmbh-allianz.de/hcm/

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Abstracts Invited Talks

INVITED LECTURE 1: Maria Elena Torres-Padilla

Institute of Epigenetics and Stem Cells, HMGU Munich

Epigenetic mechanisms in early mammalian development

A fundamental question in biology is to understand the mechanisms underlying cellular plasticity. This plasticity or potency is the ability of a cell to give rise to multiple cell types upon differentiation. In mammals, following fertilization and fusion of the gametes –two highly differentiated cells- intense chromatin remodeling and epigenetic reprogramming are necessary for the reversion to an undifferentiated state to restore full developmental potency (totipotency). Subsequent development and differentiation are accompanied with progressive loss of potency. Research in my lab focuses on understanding how chromatin regulates cell plasticity, cell fate and reprogramming using the early mouse embryo as a model system. In particular, we are interested in determining how the structure of the chromatin is established at the beginning of development to enable totipotency, and how this structure is remodelled during pre-implantation development, to give rise to pluripotency. Ultimately, this will allow us to underscore the mechanisms behind totipotency and epigenetic reprogramming. Remarkably, we have found that specific features of embryonic chromatin are also present in totipotent-like cells in vitro. Based on this, we have begun to decipher key molecular regulators of repetitive elements in the embryo. Our results have identified candidate proteins that regulate chromatin function and expression of these elements and show that they can induce totipotent-like cells in vitro. I will discuss our recent contributions documenting how the embryonic epigenome is shaped by heterochromatin and by the activity of retrotransposons, and their implication in establishing totipotency.

INVITED LECTURE 2: Robert Schneider

Institute of Functional Epigenetics, HMGU Munich

Novel Players in Chromatin

One of the major goals of post-genomic biological research is to understand the molecular basis and physiological role of covalent protein modifications. These post-translational modifications (PTMs) can regulate protein interactions and thus trigger particular downstream responses. It has been suggested that PTMs of histones constitute a so-called "histone code" defining distinct chromatin or “epigenetic” states. Nonetheless the set of characterised histone modifications is far from complete and many modifications are awaiting identification.

How mechanistically chromatin and “epigenetic” states are inherited through cellular divisions is currently only poorly understood. We are just beginning to understand how chromatin states (and chromatin modulators) can mediate “epigenetic” memory and the inheritance of these states on individual cell level.

One of the key questions in the field is if histone PTMs can be causative for processes like transcription or are just by-products, with limited functional relevance. We recently demonstrated a causative function for novel lysine acetylations on the lateral surface of the histone octamer in transcriptional control. Here I will present our work on novel players in the regulation of chromatin function.