



Biochemistry meets Epigenetics

Master Thesis / Diploma Thesis

in
Molecular Biotechnology / Biology

The groups of Mark Helm (IPMB, University of Heidelberg) & Frank Lyko (Department of Epigenetics, DKFZ) are looking for a motivated student who wants to do her/his Master Thesis at the interface of Epigenetics and Biochemistry.

Topic: Identification of signal mediators of an enigmatic methyltransferase

Central object of study is Dnmt2, a member of a group of well conserved DNA-methyltransferases. By methylating DNA, in particular promoter sequences, members of the Dnmt family govern gene expression on the epigenetic level. Malfunctions of these molecules are associated with developmental aberrations and cancer. Surprisingly, the Dnmt2 protein has been shown to also methylate RNA, and the object of this thesis is to identify methylated RNAs and to investigate how they may affect gene expression.

Methods and Work Program

The work starts with a basic characterization of the methylation reaction *in vitro* using human and Drosophila Dnmt2. Using different RNA substrates, the aim is to characterize a minimal recognition motive in either sequence or 3D structure of the RNA. From an identified minimal motive, a bioinformatic search for possible target RNAs will be performed, and identified candidate molecules will be studied *in vivo* (Drosophila).

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