



**University of Stuttgart**

**Stuttgart Research Center Systems Biology (SRC SB)**

## Systems Biology Seminar Talk

„The fifth base: towards a  
better understanding of DNA  
methylation “

**Prof. Dr. Steve Hoffmann**

*Leibniz-Institute on Aging – Fritz  
Lipmann  
Institute (FLI), Jena, Germany*



### Abstract:

While the cells of our body carry almost exact copies of the same genomic code, they can differ drastically in appearance and function. In part, these striking variations are caused by the so-called epigenome, a set of different chemical modifications of the DNA and its associated proteins orchestrating the genome's activity. The modification of DNA cytosines by methyl groups added to the 5th carbon atom of the pyrimidine ring, short 5mC, is one of its most critical components. Involved in genome stability and gene expression regulation, it plays a vital role in developmental processes, exposes striking patterns in many cancers, and appears to correlate well with chronological aging. Because of the high tissue specificity of the DNA methylation landscape and its marked susceptibility to environmental conditions, a complete understanding of 5mC's function is hard to achieve. In addition to the complex and expensive wet-lab protocols required to measure 5mC at single-nucleotide resolution, the computational analysis and integration of methylation signals become a significant bottleneck. Here, we will shed light on strategies to identify significant changes in 5mC levels and analyze their potential impact on cancerogenesis. Furthermore, we will briefly examine the "5th base's" cross-species conservation and discuss other questions arising in epigenome analysis.

### CV:

Steve Hoffmann, born in 1978, studied medicine, computer science and bioinformatics at the Universities of Marburg, Göttingen and Hamburg. He holds doctorate degrees in medicine and bioinformatics. As of late 2017 he is a group leader at the Leibniz Institute on Aging and a professor for computational biology at the Friedrich Schiller University Jena. His main research interest is the development of methods to investigate the epigenomic regulation of genome activity.

**Wednesday**  
**May 19, 2021**  
*10 a.m. – 11 a.m.*

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