2022 PhD project in the Mueller-Planitz lab

Transcription- and aging-mediated assault on the nucleosome organization of the genome

Our laboratory studies the core components of chromatin – the nucleosomes and the machinery that places them in the genome (Figure). Nucleosomes densely coat eukaryotic DNA and control almost every process in the nucleus including transcription and replication. The nucleosome architecture is under constant assault from a variety of factors including transcription and cellular aging. The aim of the project is to dissect the decline of the nucleosome architecture during transcription and cellular aging. We do so with cutting-edge technology that we are developing in the lab that uses long-read sequencing to visualize individual nucleosome patterns on single DNA molecules in single cells.

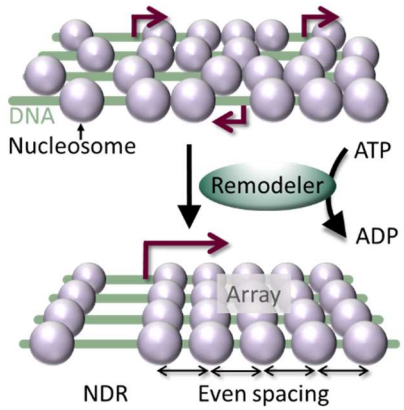

Figure: Remodeling enzymes establish the nucleosome organization over genes. In an ATP hydrolysis-dependent manner, remodelers position the first nucleosome downstream of the transcription start site (red arrow; bottom), and induce even spacing between nucleosomes downstream of it. Without remodelers (top), cryptic promoters open, leading to spurious transcription.

Get in touch (felix.mueller-planitz@tu-dresden.de) and apply over the DIGS website if you love epigenetics, genomics, and long-read sequencing as much as we do! Especially if you have an affinity not only for molecular biology but also for bioinformatics!