REGULATION AND DYNAMICS OF DNA REPAIR IN A CHROMATIN CONTEXT

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Our cells receive tens of thousands of different DNA lesions per day. Failure to repair these lesions will lead to cell death, mutations and genome instability, which contribute to human diseases such as neurodegenerative disorders and cancer. Efficient recognition and repair of DNA damage, however, is complicated by the fact that genomic DNA is packaged, through histone and non-histone proteins, into a condensed structure called chromatin. The DNA repair machinery has to circumvent this barrier to gain access to the damaged DNA and repair the lesions. By using a cross-disciplinary approach that combines novel and cutting-edge genomics approaches with bioinformatics, genetics, biochemistry and high-resolution microscopy, we identified several chromatin-modifying enzymes and showed how these enzymes regulate DNA repair in chromatin to maintain genome stability and counteract human diseases. At the meeting, I will present some of our recent findings and indicate the current status of our work.