

***Enhanced Chromatin Dynamics by FACT Promotes Transcriptional Restart after  
UV-Induced DNA Damage***

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**Abstract:**

Facilitates chromatin transcription (FACT) is a heterodimer of SPT16 and structure-specific recognition protein-1 (SSRP1) proteins. FACT is classified as chromatin-remodeling factor essential for various processes within nuclei, such as transcription, DNA replication, and DNA repair. In this presentation, I introduce an important role of FACT for DNA damage induced by UV-C expose.

UV damage induction induces accelerated removal from and reincorporation into chromatin of H2A/H2B dimers, and similarly, SSRP1 and SPT16 accumulate at site of UV damage. Knockdown of SPT16 strongly reduced the H2A exchange upon UV damage, while SSRP1 depletion did not have a clear effect on histone exchange. In addition, knockdown of both FACT subunits or of SPT16 alone resulted in a strong decrease in recovery of RNA synthesis (RRS). In this way, SPT16 plays an important role in the completion of DNA repair allowing efficient restart of transcription after repair of the DNA damage.

**References:**

1. Dinant C, Ampatzidis-Michailidis G, Lans H, Tresini M, Lagarou A, Grosbart M, Theil AF, van Cappellen WA, Kimura H, Bartek J, Foustieri M, Houtsmuller AB, Vermeulen W, Marteijn JA, Enhanced chromatin dynamics by FACT promotes transcriptional restart after UV-induced DNA damage. *Mol Cell*. **51**, 469-79, 2013
2. Tsunaka Y, Toga J, Yamaguchi H, Tate S, Hirose S, Morikawa K. Phosphorylated intrinsically disordered region of FACT masks its nucleosomal DNA binding elements. *J Biol Chem*. **284**, 24610-21, 2009
3. Hondele M, Stuwe T, Hassler M, Halbach F, Bowman A, Zhang ET, Nijmeijer B, Kotthoff C, Rybin V, Amlacher S, Hurt E, Ladurner AG, Structural basis of histone H2A-H2B recognition by the essential chaperone FACT. *Nature*. **499**, 111-4, 2013