



## Molecular dynamics investigation of DNA tandem lesions repair

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DNA integrity is constantly threatened by radicals and sunlight, leading to chemical modifications of nucleobases. For two neighboring simple DNA defects, the repair turns out to be dramatically lowered [1]. However the field suffers from X-ray or NMR structure to interpret the repair rate measurements of such tandem lesions (10% of the total 8-oxoguanines).

Relying on all-atom explicit-solvent molecular dynamics, we explore the structure of oligonucleotides and DNA-enzyme systems featuring two oxidized guanine sites. Our simulations recover sequence effects [2] and provide atomic-scale structural insights into the lack of non-covalent interactions that induce a low repair of 8-oxoguanine and abasic sites with Nfo[2], APE1[3] and Fpg.



a) Seq-1 b) Seq+3 Cartoon representation of two DNA sequences showing contrasted recognition by the endonuclease APE1, leading to a lower repair rate for seq+3.

## References

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