DNA damage repair—molecular insights

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The first line of defense against skin cancer is the ability to repair DNA damage caused by UV light. The XPA protein plays an important role in the repair of certain DNA damage, and mutations in this protein have been implicated in xeroderma pigmentosum (XP) disorders, characterized by increased UV sensitivity and risk for skin cancer.

Walter J. Chazin, PhD, and colleagues from the Vanderbilt Center for Structural Biology investigated how XPA interacts with DNA and the effects of several disease-associated mutations in XPA on its molecular structure and ability to bind DNA.

Using nuclear magnetic resonance spectroscopy, which allows for characterization of the structures of XPA molecules, they identified the critical parts of the protein that are responsible for binding DNA. Moreover, their results revealed that the extent of disruption to DNA-binding activity correlates with severity of disease symptoms.

These findings, published Oct. 13 in the *Journal of Biological Chemistry*, provide insight into XP disease and how several types of DNA damage are repaired.

More information: Norie Sugitani et al. Analysis of DNA binding by human factor xeroderma pigmentosum complementation group A (XPA) provides insight into its interactions with nucleotide excision repair substrates, *Journal of Biological Chemistry* (2017). DOI: 10.1074/jbc.M117.800078

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