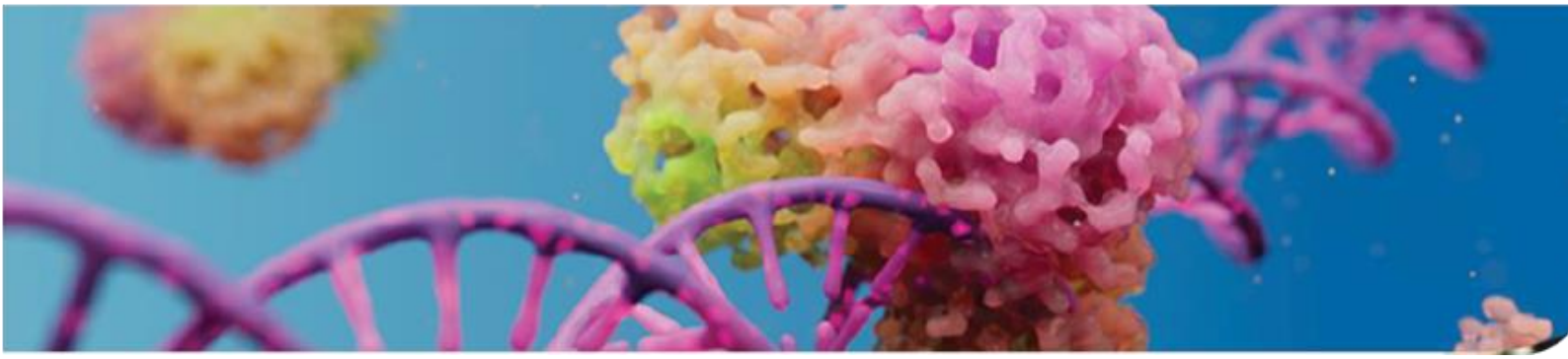


NCBR SEMINAR SERIES

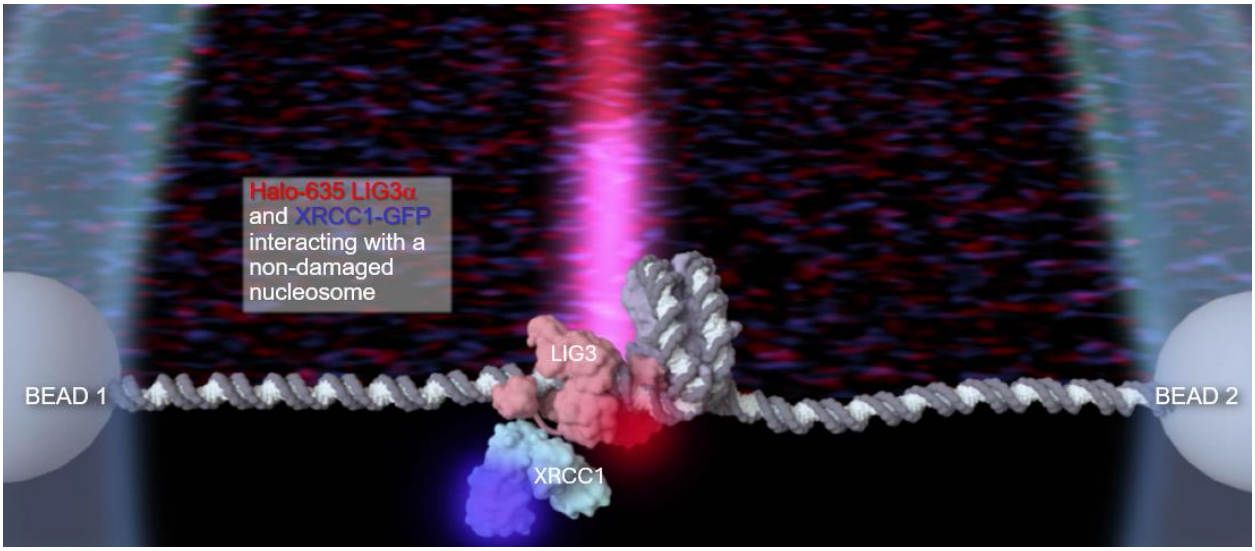
WATCHING DNA REPAIR AT THE SINGLE MOLECULE LEVEL IN REAL-TIME: SEEING IS BELIEVING

SPEAKER: DR. BENNETT VAN HOUTEN (University of Pittsburgh)

WHEN: APRIL 17th 2025

WHERE: 205/B11

This seminar will present a new **rapid** and **robust method** for **single molecule analysis of DNA binding proteins** from nuclear extracts (SMADNE) of human cells expressing a fluorescently tagged protein of interest. SMADNE when combined with the **LUMICKS C-trap** provides unprecedented observations of **DNA repair protein dynamics on damaged DNA**. Over the last 18 months our group has been able to analyse the dwell times of 35 proteins or protein variants on DNA substrates using this approach. After a brief introduction to DNA damage and base excision repair, this seminar will discuss new unpublished data, including the DNA binding dynamics of PARP1 and PARP1 variants or DNA LIG3-XRCC1 on nicks in naked DNA and in a nucleosomes. An important glycosylase, TDG, involved in active oxidative demethylation of 5mC through base excision repair will also be discussed. Finally, the non-specific DNA interactions and the binding behaviour to 8-oxoG of purified eGFP-OGG1, purified eGFP-OGG1 added to extracts, and eGFP-OGG1 from human cell nuclear extracts will be directly compared.



Reference:1. Schaich MA, Schnable BL, Kumar N, et al. Single-molecule analysis of DNA-binding proteins from nuclear extracts (SMADNE). *Nucleic Acids Res. 2023;51(7):e39*. doi:10.1093/nar/gkad095

2. Schnable BL, Schaich MA, Roginskaya V, et al. Thymine DNA glycosylase combines sliding, hopping, and nucleosome interactions to efficiently search for 5-formylcytosine. *Nat Commun. 2024;15(1):9226.* Published *2024* Oct 25. doi:10.1038/s41467-024-53497-7