

In the news

THE NOBEL PRIZE 2015 THE YEAR OF DNA REPAIR

Last month, Stephen J. Elledge and Evelyn M. Witkin won the [Albert Lasker Basic Medical Research Award](#) “for discoveries concerning the DNA-damage response”, and now it is the turn of Tomas Lindahl (Francis Crick Institute, UK), Paul Modrich (Duke University, USA) and Aziz Sancar (University of North Carolina, USA), who were jointly awarded the [Nobel Prize in Chemistry 2015](#) “for mechanistic studies of DNA repair”.

DNA damage can result from mistakes in DNA replication or can be caused by external factors (chemicals and radiation) or reactive metabolites that are produced during physiological processes. To maintain genome integrity, cells have evolved several repair pathways. Lindahl, Modrich and Sancar pioneered the research of the intricate mechanisms of DNA damage repair.

Lindahl observed that DNA is subject to mutagenesis under physiological conditions and determined, in the 1970s, that DNA glycosylases are involved in base excision repair. In the 1980s, Sancar purified Uvr proteins that mediate nucleotide excision repair and reconstituted the essential steps of this pathway, which repairs lesions induced by UV light. Modrich provided detailed biochemical descriptions of mismatch repair, which corrects erroneous base pairing introduced during replication.

Following their initial work in bacteria, these eminent scientists and others later elucidated how these repair pathways function in eukaryotes and have provided insight into how they could be exploited for therapy. As Sancar commented: “[repair mechanisms] are also important in cancer treatment because many of the anti-cancer drugs do damage DNA and whether cancer cells can repair it or not can influence how cancer is treated”.

The Guardian, 7 Oct 2015.

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