

PRAQUE 2010

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The Society for Experimental Biology

DNA Repair and Recombination

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The existence of rapid and efficient mechanisms for the repair of DNA damage is essential for the maintenance of genomic integrity in all organisms. DNA incurs damage as a consequence exposure to environmental stresses (radiation, genotoxic chemicals) but also in the normal course of DNA replication. DNA damage can be mutagenic, and in the case of the incidence of double-strand breaks, highly cytotoxic through the loss of genetic information. All cells maintain biochemical mechanisms for the surveillance of the genetic material and its rapid and accurate repair in the event of damage. Additionally, these mechanisms also have important functions in maintaining genetic diversity (meiotic recombination) and can be exploited for the integration of transgenes. Understanding the diverse mechanisms by which DNA damage is repaired is a prerequisite for developing therapies for conditions like cancer, for enhancing recombination rates in plant breeding technologies and in developing novel “clean gene transfer” methodologies. In this session we explore the most recent advances in our understanding of DNA repair and recombination, with the principal focus on processes occurring in plant cells. Our invited speakers are all leading experts in the field of plant DNA repair and recombination, and their contributions are counterpointed by the extensive studies in mammalian and yeast systems, that are highlighted in our two Keynote Lectures. **Dr Steve West** has characterised the functions of the major recombinases in mammalian cells, and determined the structure of the Holliday junction: the defining feature of homology-dependent DNA repair in somatic and meiotic recombination. **Dr. Michael Lisby** has shown how DNA damage is undertaken in dedicated “repair shops” in yeast nuclei, through visualisation of the assembly of multi-protein repair complexes, *in vivo*.

Invited Speakers include: **Stephen C West**, Cancer Research,
Michael Lisby, University of Copenhagen, **Holger Puchta**, Universität Karlsruhe,
Chris Franklin, University of Birmingham, **Charles White**, Clermont Université,
Karel Riha, Gregor Mendel Institute of Molecular Plant Biology