

Stellingen behorende bij het proefschrift

Functional Architecture of Molecular Complexes involved in DNA double-strand break Repair

Dejan Ristić

1. The different preference of Rad52 and Ku70/80 for binding to DNA substrates proves that these two proteins do not compete as “gatekeepers” of different DNA double-stranded break repair pathways.
This thesis, Chapter 4
Van Dyck, E. et al. (1999) Nature, 398, 728-731 (A competition between Ku70/80 and Rad52 for DNA end binding provides a molecular switching point between DNA double-strand break repair by non-homologous end joining and homologous recombination)
Haber, J.E. (1999) Nature, 398, 665-667
2. Annealing of complementary single-strand DNA molecules is not a specific activity of Rad52 but it is the result of Rad52's ability to bring single-strand DNA molecules in close proximity independent of their DNA sequence.
This thesis, Chapter 4
Mortensen, U.H. et al. (1996) Proc. Natl Acad. Sci. USA, 93, 10729–10734 (Rad52 promote single-strand DNA annealing reactions in vitro)
3. The architecture of human Rad54-DNA complex in the presence of ATP, where Rad54 anchors the junction between relaxed and supercoiled DNA domain, suggests that Rad54 translocates along DNA.
This thesis, Chapter 5
4. The assembly and disassembly of Rad51 nucleoprotein filaments, unlike RecA filaments, take place from multiple places along the filament, which has important structural and mechanistic implications.
This thesis, Chapter 6
5. Rad51 forms stable and regular filaments with extended double-stranded DNA in conditions that stimulate homologous recombination *in vitro*. The common feature of these conditions is trapping of the “ATP-bound” form of Rad51.
This thesis, Chapter 6

6. The differential effect of deletion of rad52 on DSB repair in *Saccharomyces cerevisiae* and mice is due to the breast cancer associated gene 2 (BRCA2).
Rijkers, T. et al. (1998) Mol. Cell. Biol., 18, 6423-6429
Kojic, M. et al. (2005) Mol. Cell. Biol., 25, 2547-2557
Yang, H. et al. (2005) Nature, 433, 653-6577.
7. Direct visualisation of Hop2-Mnd1 interaction with specific DNA substrates or Rad51 and Dmc1 filaments will provide unique information on still mysterious mechanism of action of these recombination mediators.
8. Scanning force microscopy is a unique technique because it allows imaging as well as manipulation of single molecules.
9. "In the field of observation, chance favours only the prepared mind. "
Louis Pasteur
This should not be understood to mean that you see just what you want to see.
10. The ability to study life processes *in vitro* does not imply the ability to start from *in vitro* results and reconstruct life.
11. The cloning of humans is on most of the lists of things to worry about from Science, along with behaviour control, genetic engineering, transplanted heads, computer poetry and the unrestrained growth of plastic flowers.
Lewis Thomas (found at <http://www.quotationspage.com>)