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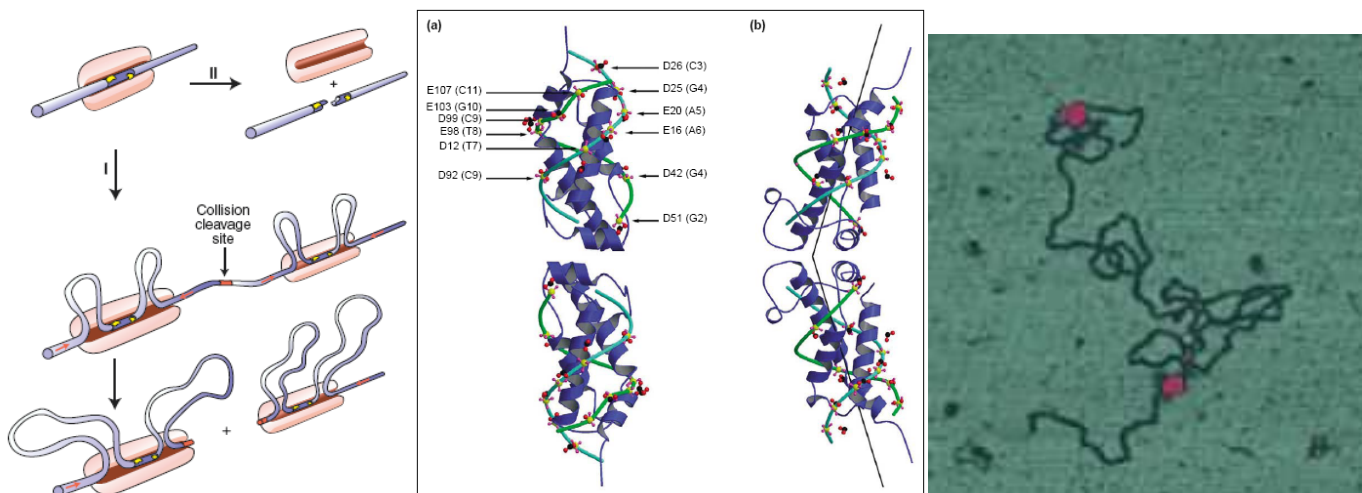
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Research Interests: protein-DNA interactions, bio-molecular machines, protein mimics of DNA structure, fluorescence spectroscopy, single-molecule imaging, prokaryotic DNA restriction and modification systems.



I am interested in all aspects of protein and DNA structure and dynamics with particular emphasis on combining physical and biological techniques at the "interface" between the physical and life sciences. Current research projects are:

1. **Smart biomolecular machines- the type I DNA restriction enzymes**
2. **DNA mimicry by proteins for the control of gene transfer**
3. **Nucleotide base flipping and DNA distortion- fluorescence of 2-aminopurine**
4. **Fluorescence lifetime imaging and microfluidics for protein folding and Enzymology**



SELECTED PUBLICATIONS

- 1) Single molecule imaging of *Bacteroides fragilis* AddAB reveals the highly processive translocation of a single motor helicase. Reuter, M. *et al.*, *Nucleic Acids Res.* [2010] **38**, 3721-31.
- 2) The structure of the KlcA and ArdB proteins reveals a novel fold and antirestriction activity against Type I DNA restriction systems *in vivo* but not *in vitro*. Serfiotis-Mitsa, D. *et al.*, *Nucleic Acids Res.* [2010] **38**, 1723-37.
- 3) Dissection of the DNA mimicry of the bacteriophage T7 Ocr protein using chemical modification. Stephanou, A.S., *et al.*, *J. Mol. Biol.* [2009] **391**, 565-76.
- 4) Super-resolution imaging of DNA labelled with intercalating dyes. Flors, C. *et al.*, *Chem Phys Chem.* [2009] **10**, 2201 - 2204
- 5) Extensive DNA mimicry by the ArdA antirestriction protein and its role in the spread of antibiotic resistance. McMahon, S. *et al.*, *Nucleic Acids Res.* [2009] **37**, 4887-4897.
- 6) Atomic force microscopy of the EcoKI type I DNA restriction enzyme bound to DNA shows enzyme dimerisation and DNA looping. Neaves, K.J. *et al.*, *Nucleic Acids Research* [2009] **37**, 2053-63
- 7) The structure of M.EcoKI Type I DNA methyltransferase with a DNA mimic antirestriction protein. Kennaway, C.K. *et al.*, *Nucleic Acids Research* [2009] **37**, 762-70.
- 8) How much of protein sequence space has been explored by life on Earth? Dryden, D.T.F. *et al.*, *J R Soc Interface.* [2008] **5**, 953-6.
- 9) Fast-scan atomic force microscopy reveals that the type III restriction enzyme EcoP15I is capable of DNA translocation and looping. Crampton, N. *et al.*, *Proc. Natl. Acad. Sci USA* [2007] **104**, 12755-60.
- 10) 2-Aminopurine Flipped into the Active Site of the Adenine-Specific DNA Methyltransferase M.TaqI: Crystal Structures and Time-Resolved Fluorescence. Lenz, T. *et al.*, *J. Am. Chem. Soc.* [2007] **129**, 6240 -6248.
- 11) DNA Mimicry by Proteins and the control of enzymatic activity on DNA. Dryden, D.T.F. *Trends in Biotechnology.* [2006] **24**, 378-382.
- 12) The Biology of Restriction and Anti-restriction. Tock, M.R. and Dryden, D.T.F. *Current Opinion in Microbiology.* **8**, 466-472 [2005].