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Selected Publication

Mizuno K, Miyabe I, Schalbetter S, Carr AM, Murray JM. (2013) Recombination-restarted replication makes inverted chromosome fusions at inverted repeats. *Nature*, 493, 246-249.

Research Aims and Interests

My laboratory studies the pathways and molecules that are involved in DNA damage responses and the maintenance of genomic stability. In particular, we concentrate on the DNA structure-dependent checkpoints and the relationship between DNA replication and recombination. The laboratories main experimental system is the fission yeast *S. pombe*, although we also exploit mammalian cells and transgenic mice to answer specific questions that arise from our analysis in the yeast. We developed a unique replication fork arrest system in fission yeast that has allowed us to demonstrate that arrested replication forks are highly recombinogenic and to identify pathway and mechanisms that lead to the generation of gross chromosomal rearrangements. We are particularly interested in the nature of the replication machinery and the structure of the replication fork once replication has been restarted by homologous recombination: such forks are not canonical and make errors at high frequency, with a particular propensity to U-turn at inverted repeat sequences. My laboratory has also developed super-resolution microscopy (PALM) for the analysis of DNA replication proteins and we are applying these methodologies to a range of questions in the genome stability field. The laboratory also has an interest in the regulation of ribonucleotide reductase.