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**Going Fast and Slow: How DNA Motors Direct Homologous Recombination**

Homologous recombination (HR) is a DNA double strand break repair pathway that protects genomic integrity in all organisms. In contrast to other repair pathways HR is template based, which means it needs to find a matching DNA sequence element elsewhere in the genome to complete repair. The ability to locate a template for repair is carried out by the recombinase Rad51. Apart from the enzymatic function of Rad51 to find a template, it also recruits several DNA motor proteins to sites of DNA damage to catalyze the repair process. Among these are the conserved Snf2 motor proteins Rad54 and Rdh54. These proteins are paralogs that regulate when and where Rad51 can function during HR. Our laboratory has been using a combination of genetic, single molecule, and biochemical approaches to understand the mechanisms by which these related motor proteins are able to control the activity of Rad51. I will discuss some of our recent findings in the broader context of genome maintenance.