DNA Repair Mechanisms in Yeast: Shu Complex Interactions with Rdh54

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Maintenance of genome stability is important for preventing DNA damage, which leads to cancer when unrepaired. One method of DNA repair is homologous recombination (HR), where the Shu complex stabilizes Rad51 filaments. In Saccharomyces cerivisiae, the Shu complex, whose human homologues are linked to breast and ovarian cancer, consists of SHU1, SHU2, PSY3, and CSM2. The Shu complex was previously shown to interact with Rdh54, but it is unknown which complex members mediate this interaction. Knockouts of individual Shu genes at their endogenous locus using HR were used in a yeast-2-hybrid assay, studying protein-protein interactions between the Shu complex and Rdh54. It was found that Shu complex members mediate interaction of fellow constituents with Rdh54. For example, deletion of SHU1 disrupts the interaction between Shu2 and Rdh54. Furthermore, SHU2 and PSY3 are required for efficient interaction between Csm2 and Rdh54. In contrast, deletion of the SHU1, SHU2, or CSM2 had no effect on Psy3's interaction with Rdh54, which creates a model where Psy3 is the central protein mediating interactions between the Shu complex and Rdh54.

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