World Academy of Science, Engineering and Technology
International Journal of Bioengineering and Life Sciences
Vol:12, No:01, 2018

Analysis of Replication Protein A (RPA): The Role of Homolog Interaction and Recombination during Meiosis

Authors : Jeong Hwan Joo, Keun Pil Kim

Abstract : During meiosis, meiotic recombination is initiated by Spo11-mediated DSB formation and exonuclease-mediated DSB resection occurs to expose single stranded DNA formation. RPA is further required to inhibit secondary structure formation of ssDNA that can be formed Watson-Crick pairing. Rad51-Dmc1, RecA homologs in eukaryote and their accessory factors involve in searching homolog templates to mediate strand exchange. In this study, we investigate the recombinational roles of replication protein A (RPA), which is heterotrimeric protein that is composed of RPA1, RPA2, and RPA3. Here, we investigated meiotic recombination using DNA physical analysis at the HIS4LEU2 hot spot. In rfa1-119 (K45E, N316S) cells, crossover (CO) and non-crossover (NCO) products reduced than WT. rfa1-119 delayed in single end invasion-to-double holiday junction (SEI-to-dHJ) transition and exhibits a defect in second-end capture that is also modulated by Rad52. In the further experiment, we observed that in rfa1-119 mutant, RPA could not be released in timely manner. Furthermore, rfa1-119 exhibits failure in the second end capture, implying reduction of COs and NCOs. In this talk, we will discuss more detail how RPA involves in chromatin axis association via formation of axis-bridge and why RPA is required for Rad52-mediated second-end capture progression.

Keywords : homolog interaction, meiotic recombination, replication protein A, RPA1
Conference Title : ICMBR 2018 : International Conference on Molecular Biology and Research
Conference Location : Singapore, Singapore
Conference Dates : January 08-09, 2018